NORRIEGO POINT STABILIZATION AND RESTORATION PROJECT

CONSTRUCTION SPECIFICATIONS

PREPARED FOR:

DEEPWATER HORIZON PROGRAM
DIVISION OF WATER RESTORATION ASSITANCE
FDEP CONTRACT NO. RM156

PREPARED BY:

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CONSTRUCTION SPECIFICATIONS

TABLE OF CONTENTS

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SECTION 01 11 00

SUMMARY OF WORK

PART 1 GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

A. Owner: See Article I, General Conditions

B. Consultant: See Article I, General Conditions

C. Engineer of Record (EOR): Engineer whose name and seal is affixed to the drawings and specifications

D. Project Description

1. The intent of this project is to construct shoreline stabilization structures along and offshore of Norriego Point (Point) and to restore the beach and dune areas of the Point. The sand fill material to restore the beach and dune areas shall be dredged from the Federal East Pass and Destin Harbor navigation channels.

2. This project generally entails constructing rock and sheet pile T-Groins and shoreline stabilization structures (including installing sheet pile walls internal or adjacent to the structures, excavating existing submerged bottom, placement of a marine mattress foundation, and rock placement), repair and enhancement of existing rock T-Groin and Spur Groin structures (including excavating existing submerged bottom, placement of a marine mattress foundation, and rock placement), upland excavation and grading, dredging approximately 115,000 cubic yards (CY) from the East Pass and Destin Harbor (Old Pass Lagoon) navigation channels, and placing the beach compatible dredged sand within the project area as shown on the Drawings. The actual volume of dredging will depend upon pre-dredging surveys performed prior to construction. This project includes all work associated with these major project elements as well as the final site restoration following construction.

3. The major categories of work include, but are not limited to the following:

a. Installation of sheet pile walls and concrete or timber caps

b. Submerged bottom excavation and grading

c. Construction of rock T-Groin breakwaters and rock shoreline stabilization structures

d. Repair and enhancement of existing rock T-Groin and Spur breakwater structures

e. Upland excavation and grading

f. Placing temporary in-water pipelines for transporting dredged material

g. Hydraulic dredging

h. Dredged material placement

i. Upland grading and shaping

j. Site Restoration

4. The DEP will administer the entirety of this project.

E. The Contractor shall check all Project Drawings and Specifications furnished to him immediately upon their receipt and shall promptly notify the DEP Project Manager of all errors, inconsistencies, omissions, and discrepancies. Dimensions marked on Project Drawings shall, in general, be followed in preference to scaled measurements. Anything mentioned in the Specifications and not shown on the Project Drawings, or shown on the Project Drawings and not mentioned in the Specifications, shall be of like effect as if shown or mentioned in both. In the case of an inconsistency between Drawings and Specifications or within either document not clarified by addendum, the better quality or greater quantity of Work shall be provided in accordance with the Engineer's interpretation. In case of a discrepancy either in the dimensions, in the Project Drawings, or in the Specifications, the matter shall be submitted to the DEP Project Manager who shall make a determination in writing. Any adjustment by the Contractor without such a determination by the DEP Project Manager shall be at its own risk and expense. All deviations made by the Contractor from the Specifications and Project Drawings will be compiled and provided to the DEP Project Manager in the form of Record Drawings (See SECTION 01 77 00 – PROJECT CLOSEOUT). The DEP may furnish from time to time such detailed Project Drawings and other information considered necessary to clarify the Contract.

F. Omissions from the Project Drawings or Specifications or the mis-description of details of Work which are clearly necessary to carry out the intent of the Project Drawings and Specifications, or which are customarily performed, shall not relieve the Contractor from performing such omitted or mis-described details of the Work as if fully and correctly described in the Project Drawings and Specifications. If the Contractor performs any construction activity knowing it involves a recognized error, inconsistency, or omission in the Contract without providing written notice to the DEP, the Contractor shall assume appropriate responsibility for such performance and shall bear an appropriate amount of the attributable costs for correction. Standard references used in the Specifications shall be the latest revision or edition of that reference, any such referenced paragraph, or section revised shall apply to the Work as indicated.

1.02 PHYSICAL DATA

A. Physical Conditions

The indications of physical conditions on the Project Drawings and in the specifications are the result of site investigations by surveys and/or by geotechnical testing. When the indicated physical conditions are the result of geotechnical site investigations, the geotechnical data and report are appended to these specifications. While the geotechnical data is representative of subsurface conditions at their respective locations and vertical reaches, local variations characteristic of the subsurface materials of this region are to be expected.

B. Weather Conditions

The project area is subject to tropical storms and hurricanes from June through November (or later) and to windy and/or rainy weather during any time of the year. The climate of the area is essentially subtropical, and temperatures below freezing are rare. In general, the winter months constitute the dry season, and rainfall is usually associated with mid-latitude systems (fronts and low pressure systems). The summer months generally comprise the wet season, and rainfall is closely associated with convective activity. These rainfall events are normally of short duration

and amounts are quite variable spatially. Occasionally, daily rainfall in the dry season can be quite heavy as mid-latitude systems penetrate into Florida.

C. Rain, Wind, and Wave Data

It shall be the Contractor's responsibility to obtain information concerning rain, wind, and wave conditions that could influence his operations. Reference is made to the following publications, which contain climatological and meteorological observations and data. The Contractor is encouraged to purchase and review these publications from the agencies indicated as well as review additional information that may be available but not listed.

1. Local Climatological Data - Monthly Summary. Published by NOAA, Asheville, N.C. Subscription price and ordering information available from the National Climatic Data Center, Federal Building, Asheville, N.C. 28801. This publication gives hourly wind speed and direction observations. The Annual Summary gives a summary of the observations for the period of record.

2. Summary of Synoptic Meteorological Observations: North American Coastal Marine Areas Atlantic and Gulf Coasts. Produced by Naval Weather Service, U.S. Department of Commerce. Distributed by National Technical Information Service, U.S. Department of Commerce.

3. U.S. Coast Pilot, Atlantic Coast: Gulf of Mexico, Puerto Rico, and Virgin Islands, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service. This publication supplements the navigational information shown on the nautical charts. It also provides miscellaneous meteorological data. This publication is available through NOAA.

4. Gulf of Mexico Hindcast Wave Information, Wave Information Studies of U.S. Coastlines, WIS Report 18, Waterways Experiment Station, March 1989 (or later). This report presents 20-year wave hindcast summaries at various stations located along the U.S. Gulf of Mexico shoreline, including locations offshore of the project area. Available data include wave height, period, and direction summary tables for two 20-year periods: 1956-75 (excludes tropical disturbances/hurricanes), and 1976-95 (includes tropical disturbances/ hurricanes), summary wind speed and wind direction tables, summary tables of mean wave heights by month and year, largest wave heights by month and year, and a table of extreme wave events. This publication is available from National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22151. Time series listings of wave data for both 20-year periods and some summary information are available at the Waterways Experiment Station website: http://wis.usace.army.mil/.

5. National Data Buoy Center (NDBC) Website. This Internet web site provides a wide range of meteorological and oceanographic buoy data collected worldwide. Data provided on this website include wind speed, wind gusts, atmospheric pressure, air temperature, sea temperature, wave height, and wave period. Several C-MAN stations are located in the Gulf of Mexico; however, these stations are not located in close proximity to the project area. Gage readings are updated hourly. Archived data are available for these buoys from 1988 to the present. The website address is http://www.ndbc.noaa.gov/.

D. Water Fluctuations and Stages

1. The below stated water fluctuations are for information only and are not to be utilized in conjunction with any contract related hydrographic surveying. Reference should be made to the water level datums for surveying purposes supplied in the Project Drawings.

2. Water levels in the project area are mainly affected by tidal fluctuations in the Gulf of Mexico; however, may also be affected by increased wind events or rainfall within the

Choctawhatchee Bay watershed. The project area is also subject to storm surges from tropical cyclones and extratropical storms. The National Oceanic and Atmospheric Administration (NOAA) provides the following tide data - with approximate elevations referenced to the 1988 North American Vertical Datum (NAVD) - for the project area (http://tidesandcurrents.noaa.gov/):

Mean High Water (MHW) = 0.7 ft NAVD

Mean Low Water (MLW) = 0.1 ft NAVD

E. Contractor Investigation

The Contractor shall examine the site carefully upon which the Work is to be performed and become familiar, by his own investigations, with the various conditions which may affect the performance of the work. Refer to the DEP Agreement for additional performance of work, responsibilities, and/or requirements.

F. Maritime Traffic

Maritime Traffic in the project area consists of commercial, pleasure, and recreational vessels of all types and sizes which can be accommodated by existing depths.

G. Obstructions of Navigation Channels

The Contractor will be required to conduct the work in such a manner as to minimize obstructions to navigation, and in case the Contractor's plant so obstructs the channel as to make difficult or endanger the passage of any vessels, said plant shall be promptly moved on the approach of any vessel to such an extent as may be necessary to afford a practicable passage. Upon completion of the work the Contractor shall promptly remove his plant, including ranges, buoys, piles, and other marks placed by him under the contract in navigable waters or on shore.

1.03 ORDER OF WORK

A. The Contractor shall perform his work in accordance with the Proposed Construction Sequence as outlined in the Project Drawings.

B. Contractor may be allowed to perform consecutive tasks concurrently or propose an alternative construction sequence; however, Contractor must first present the proposed construction plan demonstrating consistency with the intent of the Contract Documents for DEP Project Manager’s review and written acceptance prior to performing work.

1.04 LAYOUT OF WORK – SEE ARTICLE 4, GENERAL CONDITIONS

1.05 DAMAGE TO WORK – SEE ARTICLE 4, GENERAL CONDITIONS

1.06 EXISTING WORK

A. In addition to "FAR 52.236-9, Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements", the Contractor shall:

1. Remove or alter existing work in such a manner as to prevent injury or damage to any portions of the existing work which remain.

2. Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as approved by the Engineer. At the completion of operations, existing work shall be in a condition equal to or better than that which existed before new work started.

1.07 SAFETY

A. The Contractor is solely responsible for ensuring the safety of the premises and to protect its employees, Subcontractors, invitees, general public and all other persons during the course of the Work. The Owner or Engineer will not supervise, direct or have control or authority over, nor be responsible for, the Contractor's means, methods, or procedures to implement safe working conditions, or for any failure of the Contractor to comply with Laws and Regulations applicable to safety.

B. The Contractor is required to implement practices and procedures for working safely and in compliance with OSHA and USACE regulations and any other applicable health and safety regulations while performing the work activities or cleanup of hazardous wastes. The Contractor shall comply with EM 385-1-1, OSHA requirements in 29 CFR 1910 and 29 CFR 1926 with work performed under this contract, especially OSHA's Standards 29 CFR 1926.65 and 29 CFR 1910.120 and state specific OSHA requirements, and any others where applicable. The most stringent requirements apply where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary.

C. The Contractor shall also be responsible for delineating work zone boundaries (exclusion zones, access areas, etc.) and site security. As work progresses and field conditions are monitored, work zone boundaries may be modified (and site Drawings modified).

D. Engineer and Owner are not responsible for job site safety.

1.08 LOCATION OF UNDERGROUND UTILITIES

A. Obtain digging permits prior to start of excavation by contacting the appropriate agencies a minimum of 14 calendar days in advance. Scan the construction site with electromagnetic or sonic equipment, and mark the surface of the ground where existing underground utilities are discovered, as necessary. Verify the elevations of existing piping, utilities, and any type of underground obstruction not indicated or specified to be removed but indicated in locations where other work is to be performed or installed.

B. Notify the Engineer at least 15 days prior to starting excavation work. Contact Sunshine State One Call, 800-432-4770, prior to excavating. Contractor is responsible for marking all utilities not marked by Sunshine State One Call.

1.09 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER

In order for the Owner to award the Contractor a time extension, the following conditions must be satisfied:

1. The weather experienced at the project site during the contract period must be found to be unusually severe; that is, more severe than the adverse weather anticipated for the project location during any given month.

2. The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the Contractor.

3. Upon acknowledgment of the Notice to Proceed (NTP) and continuing throughout the contract, the Contractor will record on the daily Contractor Quality Control (CQC) report the occurrence of adverse weather and resultant impact to normally scheduled work. Actual adverse weather delay days must prevent work on critical activities for 50 percent or more of the Contractor's scheduled work day.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

--END OF SECTION--

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SECTION 00 73 19

SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

A. This specification covers the requirements for safety and occupational health requirements for the protection of the Contractor, Owner, Engineer, personnel, property and other resources.

1.02 REFERENCES

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

A. American Society of Mechanical Engineers (ASME)

ASME B30.22	(2000) Articulating Boom Cranes
ASME B30.3	(1996) Construction Tower Cranes
ASME B30.5	(2004) Mobile and Locomotive Cranes
ASME B30.8	(2004) Floating Cranes and Floating Derricks

B. National Fire Protection Association (NFPA)

NFPA 10	(2002) Portable Fire Extinguishers
NFPA 241	(2000) Safeguarding Construction, Alteration, and Demolition Operations

C. U.S. Army Corps Of Engineers (USACE)

EM 385-1-1	(2003) Safety -- Safety and Health Requirements

D. U.S. National Archives and Records Administration (NARA)

29 CFR 1910.146	Permit-required Confined Spaces
29 CFR 1926	Safety and Health Regulations for Construction

1.03 SUBMITTALS

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

A. Accident Reports (if required)

1. Submit reports as their incidence occurs, in accordance with the requirements of the paragraph entitled, "Reports."

1.04 SITE DUTIES AND CRANE OPERATORS

A. The Contractor is solely responsible for ensuring the safety of the premises and to protect its employees, Subcontractors, invitees, and all other persons during the course of the Work. The Department or Consultant will not supervise, direct or have control or authority over, nor be responsible for, the Contractor's means, methods or procedures to implement safe working conditions, or for any failure of the Contractor to comply with Laws and Regulations applicable to safety.

B. Crane operators shall meet the requirements in USACE EM 385-1-1, Section 16 and Appendix G. In addition, for mobile cranes with Original Equipment Manufacturer (OEM) rated capacitates of 50,000 pounds or greater, crane operators shall be designated as qualified by a source that qualifies crane operators (i.e., union, a government agency, and/or organization that tests and qualifies crane operators).

1.05 REPORTS

A. Accident Reports

1. For recordable injuries and illnesses, and property damage accidents resulting in $2,000 or more in damages, the Prime Contractor shall conduct an accident investigation to establish the root cause(s) of the accident, complete the USACE Accident Report Form 3394 and provide the report to the Engineer within 5 calendar day(s) of the accident. The Engineer will provide copies of any required or special forms. Additionally, Contractor shall comply with all OSHA reporting requirements.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.01 CONSTRUCTION AND/OR OTHER WORK

A. The Contractor shall comply with USACE EM 385-1-1, NFPA 241, Federal and/or State OSHA regulations, and other related submittals and activity fire and safety regulations. The most stringent standard shall prevail.

3.02 EQUIPMENT

A. Material Handling Equipment

1. Material handling equipment such as forklifts shall not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions.

2. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions.

3. Operators of forklifts or power industrial trucks shall be licensed in accordance with OSHA.

B. Weight Handling Equipment

1. Cranes and derricks shall be equipped as specified in EM 385-1-1, Section 16.

2. The Contractor shall comply with the crane manufacturer's specifications and limitations for erection and operation of cranes and hoists used in support of the work. Erection shall be performed under the supervision of a designated person (as defined in ASME B30.5). All testing shall be performed in accordance with the manufacturer's recommended procedures.

3. The Contractor shall comply with ASME B30.5 for mobile and locomotive cranes, ASME B30.22 for articulating boom cranes, ASME B30.3 for construction tower cranes, and ASME B30.8 for floating cranes and floating derricks.

4. Under no circumstance shall a Contractor make a lift at or above 90% of the cranes rated capacity in any configuration.

5. When operating in the vicinity of overhead transmission lines, operators and riggers shall be alert to this special hazard and shall follow the requirements of USACE EM 385-1-1 Section 11 and ASME B30.5 or ASME B30.22 as applicable.

6. Crane suspended personnel work platforms (baskets) shall not be used unless the Contractor proves that using any other access to the work location would provide a greater hazard to the workers or is impossible. Personnel shall not be lifted with a line hoist or friction crane.

7. Portable fire extinguishers shall be inspected, maintained, and recharged as specified in NFPA 10, Standard for Portable Fire Extinguishers.

8. All employees shall be kept clear of loads about to be lifted and of suspended loads.

9. The Contractor shall use cribbing when performing lifts on outriggers.

10. The crane hook/block must be positioned directly over the load. Side loading of the crane is prohibited.

11. A physical barricade must be positioned to prevent personnel from entering the counterweight swing (tail swing) area of the crane.

12. Certification records which include the date of inspection, signature of the person performing the inspection, and the serial number or other identifier of the crane that was inspected shall always be available for review by Engineer and Owner personnel.

13. Written reports listing the load test procedures used along with any repairs or alterations performed on the crane shall be available for review by Engineer personnel.

14. Certify that all crane operators have been trained in proper use of all safety devices (e.g. anti-two block devices).

3.03 WORK IN CONFINED SPACES

A. The Contractor shall comply with the requirements in Section 06.I of USACE EM 385-1-1, OSHA 29 CFR 1910.146 and OSHA 29 CFR 1926.21(b) (6). Any potential for a hazard in the confined space requires a permit system to be used.

1. Entry procedures. Prohibit entry into a confined space by personnel for any purpose, including hot work, until the qualified person has conducted appropriate tests to ensure the confined or enclosed space is safe for the work intended and that all potential hazards are controlled or eliminated and documented. (See Section 06.I.06 of USACE EM 385-1-1 for entry procedures.) All hazards pertaining to the space shall be reviewed with each employee during site safety meetings.

2. Forced air ventilation is required for all confined space entry operations and the minimum air exchange requirements must be maintained to ensure exposure to any hazardous atmosphere is kept below its' action level.

-END OF SECTION-

SECTION 01 29 00

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 SUMMARY

A. This section includes requirements to be used for the basis of measurement and payment. The Contractor shall receive and accept the compensation provided in the Bid Schedule as full payment for furnishing all materials, labor, tools and equipment for performing all operations necessary to complete the Work under the Agreement. Payment for all loss or damages arising from the nature of the Work, or from the action of the elements or any unforeseen difficulties, encountered during the Work until final acceptance by the Department is also included in the compensation provided in the Bid Schedule.

B. Bid prices for the various work items are to establish a total price for completing the project in its entirety. The Contractor shall include in the Bid, any item for which a separate pay item has not been established in the Bid Schedule, to reflect the total price for completing the project in its entirety, as depicted on the Project Drawings and specified herein. Unless there is a specific line item for administrative costs, such as Project Management, Quality Control and Safety, allocate such costs proportionally across all line items. The Contractor must include all costs for this project to complete all work, in total, designated in the project drawings, specifications, and bid schedule.

C. Work to be measured is described in specification sections listed for each Line Item. Measurement procedures for payment, required quantity survey or procurement documentation and payment restrictions are described in applicable specification sections.

D. Capitalized terms herein are as defined in the Agreement between the Florida Department of Environmental Protection (Owner) and Contractor or as outlined within the Project Drawings and Specifications.

1.02 SUBMITTALS

The following submittals shall be submitted in accordance with SECTION 01 33 00 SUBMITTAL PROCEDURES. The Contractor shall bring the following administrative submittal items to the Pre-Construction Meeting:

A. Schedule of Values

1. To approve the schedule of values and pay application format, the Contractor will submit a printed schedule on Contractor's standard form in electronic printout for review and approval by the Department Project Manager and Consultant at least fifteen (15) calendar days prior to the first Payment Application. List payment items sequentially in the same order as they appear in the Bid Schedule.

2. Lump sum items are to have adequate breakdown of components to facilitate evaluating completeness for payment. Breakdown components shall appear directly under the payment item heading to which they apply.

3. The Contractor will revise the schedule to list approved Change Orders, with each Application for Payment. The Contractor will submit revised Schedule of Values as necessary in accordance with this specification.

B. Construction Schedule

1. At least five (5) days prior to the pre-construction conference, submit a Construction Schedule meeting the requirements stated in the Agreement.

C. Revised Construction Schedules

1. Submit copies of the updated construction schedule to the Department Project Manager and Consultant with each Payment Application. Changes that have occurred since the last update shall be clearly marked.

1.03 BATHYMETRIC AND TOPOGRAPHIC SURVEYS

A. With each Payment Application where the Contractor requests payment for rock placement, dredging or other excavation or fill activities, the Contractor shall submit both hard and digital copies of pre-construction and post-construction topographic and bathymetric surveys to the Department Project Manager and Consultant for review and approval. See the subsequent Hydraulic Dredging and Stone Placement sections for survey requirements.

B. For each Payment Application where the Contractor requests payment for sheet pile walls and/or caps, the Contractor shall submit both hard and digital copies of post-construction topographic surveys to the Department Project Manager and Consultant for review and approval. See the subsequent Sheet Piling and Cast-in-Place Concrete sections for survey requirements.

1.04 MEASUREMENT

A. Measurement for Payment for this Project is based upon completion of the Work in accordance with the Project Drawings and Specifications for each of the items. Field measurements will determine the percent or quantity complete of work components when listed on the approved Schedule of Values. Measurements will be made using linear, area, volumetric units, or by units quantity counts, as listed on the Bid Schedule for unit quantity items and at the Department's sole discretion for lump sum items.

B. The Contractor will take all measurements and compute quantities. The Department and/or its Consultant may verify measurements and quantities as appropriate.

C. The Contractor will assist the Department and/or its Consultant by providing necessary equipment, workers, and survey personnel as required.

D. Measurement Devices:

1. Weigh Scales: Inspected, tested, and certified by the applicable State Weights and Measures Department within the past year.

2. Platform Scales: Of sufficient size and capacity to accommodate the conveying vehicle.

3. Metering Devices: Inspected, tested, and certified by the applicable State department within the past year.

E. Linear Measurement: Measured by linear dimension, at the item centerline or mean chord, in feet and tenths of a foot.

F. Measurement by Area: Measured by square dimension using mean length and width or radius, in feet and tenths of a foot.

G. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness, in feet or yard and tenths of a foot or yard.

H. Stipulated Sum/Price Measurement: Items measured by weight, volume, area, or linear means or combination, as appropriate, as a completed item or unit of the Work.

1.05 TOTAL COMPENSATION

A. Unless indicated on the Agreement, all work indicated on the Project Drawings and specified in the Bid Documents and Agreement shall be included in the Total Compensation indicated on the Bid Schedule.

B. Prices stated in the Bid Schedule shall include all costs and expenses for taxes, labor, equipment, materials, commissions, transportation charges and expenses, patent fees and royalties, labor for handling materials during inspection, together with any and all other costs and expenses for performing and completing the Work as depicted on the Project Drawings and specified herein. The basis of payment for an item in the amount shown in the Bid Schedule shall be in accordance with the description of that item provided in this Section.

C. The Contractor's attention is again called to the fact that the quotations for the various items of work are intended to establish a total price for completing the Work in its entirety. Should the Contractor feel that the cost for any item of work has not been established by the Bid Schedule or Payment Items, the Contractor shall include the cost for that work in another applicable bid item, in order that the Proposal for the project reflects the total price to be paid by the Owner for completing the Work in its entirety.

D. Changes in the Total Compensation and Completion Date require prior authorization in writing from the Owner and the Engineer, in the form of a Change Order or Work Change Directive. The Contractor is responsible for verification of all bid quantities and to report to the Department and Consultant any discrepancies found prior to ordering materials and/or equipment for construction. Refer the Agreement for specific conditions.

1.06 BASIS FOR PAYMENTS

A. The various major items of Work will be paid as follows:

1. For those items including units and unit costs on the bid schedule: by the quantity of the actual Work complete by the Contractor and accepted by the Department and Consultant multiplied by the unit cost

2. For those items listed at lump sum (LS) on the bid schedule: by the lump sum amount indicated for each bid schedule Item.

The Work shall include all miscellaneous and ancillary items necessary to construct a complete and functional Project.

1.07 SCHEDULE OF VALUES

A. The below descriptions generally outline the scope of work required for those elements of the Work to be paid for under each item listed in the Schedule of Bid Items. The Contractor shall submit a Schedule of Values per and consistent with SECTION 01 33 00 SUBMITTAL PROCEDURES.

1.08 PAYMENT ITEMS

A. Basis of Payment for Lump Sum Items

1. Payment for lump sum items — denoted as LS in the units column of the Bid Schedule — for this Project will be made at the lump sum price named in the Agreement. The Agreement price shall constitute full compensation for each item, including all required labor, products, tools, equipment, plant, transportation, services and incidentals, erection, application or installation of an item of the Work, overhead and profit as required to complete the item as indicated in the Project Drawings and Specifications. All costs for items of work, which are not specifically mentioned to be included in a particular lump sum or unit price payment item, shall be included in the listed lump sum item most closely associated with the work involved.

B. Basis of Payment for Unit Price Items

1. Quantities indicated in the Bid Schedule are for bidding and Agreement purposes only. Quantities and measurements supplied or placed in the Work and verified by the Consultant determine payment.

2. If the actual Work requires more or fewer quantities than those quantities indicated, the Contractor will provide the required quantities at the unit prices agreed to.

3. If the actual Work requires a Twenty percent (20%) or greater change in quantity than those quantities indicated, the Owner or Contractor may claim for a unit price adjustment for that item.

C. Progress Payments

1. Up to six progress payments will be made upon completion of various stages of mobilization and construction at the site.

2. For lump sum items, progress payments will be made based upon the estimated percentage of completion for each pay item requested by the Contractor and field verified by the Engineer. The Contractor shall not request payment for any lump sum items in a progress payment that is less than ten percent (10%) complete. Each subsequent request for payment of lump sum items must be at least an additional ten percent (+10%) or greater.

3. For unit price items, progress payments will be made upon receipt and acceptance of surveys used for progress payments. Surveys will be evaluated based on the linear, aerial, or volumetric change for each specific payment item. The Contractor is required to have all surveys performed and certified by a Florida licensed professional surveyor.

4. Final payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities accepted by the Department Project Manager and Consultant multiplied by a unit price of the item. Final payment for unit price Work will be accomplished by reconciliation Change Orders, if required, to adjust quantities at the end of the Project.

5. No payment, partial or complete, will be made for defective or rejected Work.

6. No separate payment will be made for additional labor and materials required for accomplishing the Project in its entirety. All labor, materials, and incidental costs shall be included for payment as part of the Proposal and the Agreement, under the several scheduled items of the Project.

1.09 DESCRIPTION OF WORK ITEMS AND SCHEDULE OF VALUES

A. The following Work items are described in order to assist the Contractor in the preparation of the Proposal and to assist the Consultant in the evaluation of progress payments during construction. The Contractor shall submit a Schedule of Values containing the work components of each Bid Item of the Proposal for approval prior to the first Payment Application for work in progress.

B. Submittals are considered part of the Contractor's administrative and overhead costs. The Contactor will not be compensated separately for submittals required by these specifications or those listed on the Project Drawings.

C. Separate payment will not be made for providing and maintaining an effective Quality Control program, and all costs associated shall be included in the applicable unit prices or lump-sum prices contained in the Bid Schedule.

D. For the purpose of the work items listed below, complete installation will mean the inclusion of demolition work, site restoration to existing or better conditions, and testing, all included in the cost to complete the work item (as applicable).

E. All work shall be completed in accordance with all applicable permits and Owner requirements.

F. Bid Item Descriptions – Unless otherwise stated, payment for all bid items will be made for furnishing and installing all materials, labor, and equipment required to complete each bid item. Each bid item shall include costs to transport the material to the Work site unless otherwise stated. The intent of the Bid Schedule described herein, is to establish a total price for completing the Work in its entirety.

G. Below is a description of the Work listed in the Bid Schedule Items. This description is not intended to be a complete and all-inclusive record of the required work items. Work includes but is not limited to the following:

1. **Section A: General Items:**

a. Item 01 - Contractor's Bonds and Insurance

1) Payment shall be made as a lump sum for this item. Seventy percent (70%) of the lump sum shall be payable upon complete mobilization of the first equipment type to the Work site.

2) The remaining portion of the lump sum (30%) shall be payable upon mobilization of the last equipment type to the Work site.

b. Item 02 - Mobilization and Other General Conditions

1) Payment will be made as follows (not necessarily in sequential order) subject to other terms of this specification:

a) Fifteen percent (15%) of the lump sum payment for Mobilization will be payable to the Contractor upon complete mobilization of necessary sheet piling installation equipment to the Work site.

b) An additional fifteen percent (15%) will be payable upon successfully installing the first 600 square feet of sheet piling in compliance with applicable Project Drawings and these Specifications.

c) Fifteen percent (15%) of the lump sum payment will be payable to the Contractor upon complete mobilization of necessary rock placement equipment to the Work site.

d) An additional fifteen percent (15%) will be payable upon installing the first 25-linear foot run of rock structure.

e) Twenty percent (20%) of the lump sum payment will be payable to the Contractor upon completion of necessary dredging equipment mobilization at the Work site.

f) An additional twenty percent (20%) will be payable upon dredging at least 4,000 cubic yards of material from the dredging area.

2) The Department may require the Contractor to furnish cost data to justify this portion of the bid. Failure to justify such price to the satisfaction of the Department Project Manager will result in payment, as determined by the Department Project Manager, for the actual cost of complete mobilization, with the remainder of this item being payable in the final application for payment. The Engineer's determination of the actual costs for this item is not subject to appeal.

3) The Owner shall bear no additional costs incurred by the Contractor due to demobilization and/or remobilization due to severe storm events which may occur during construction. Should the contractor demobilize with portions of the work remaining incomplete, payment will only be made for those portions of the work that have been completed and approved by the Department Project Manager per the specifications.

c. Item 03 - Construction Layout and As-Built Surveys

1) The Contractor shall provide a breakdown of the construction layout and as-built survey fees with the Schedule of Values submittal. Payment will be made as follows (not necessarily in sequential order) subject to other terms of this specification:

a) Payment for Construction Layout and intermediate As-Built Surveys will be payable to the Contractor in equal monthly payments, up to twenty percent (20%) of the scheduled value each month for the duration of the Work. The Contractor may request an increase in the monthly payable amount with sufficient justification for review and approval by the Engineer.

b) The Owner shall withhold up to ten percent (10%) of the scheduled value until approval of the final as-built survey by the Engineer.

d. Item 04 - Construction Quality Control Testing

1) Payment will be made as a lump sum for quality control testing as required by the Specifications. This includes, but is not limited to, rock testing, concrete sampling and testing, and dredged material sampling.

2) Payment for intermediate construction quality control testing will be payable to the Contractor in equal monthly payments, up to twenty percent (20%) of the scheduled value each month for the duration of the Work. The Contractor may request an increase in the monthly payable amount with sufficient justification for review and approval by the Engineer.

3) The Owner shall withhold up to ten percent (10%) of the scheduled value until approval of the final testing data by the Engineer.

e. Item 05 – Demobilization

1) Payment will be made as follows (not necessarily in sequential order) subject to other terms of this specification:

a) Thirty percent (30%) of the lump sum payment will be payable to the Contractor upon complete demobilization of necessary sheet piling installation equipment from the Work site and following final acceptance of sheet piling by the Department and/or Consultant.

b) Thirty percent (30%) of the lump sum payment will be payable to the Contractor upon complete demobilization of necessary rock placement equipment from the Work site and following final acceptance of the rock placement by the Department and/or Consultant.

c) Forty percent (40%) of the lump sum payment will be payable to the Contractor upon completion of final grading, site cleanup, final acceptance, and necessary dredging equipment demobilization from the Work site.

2) The Department may require the Contractor to furnish cost data to justify this portion of the bid. Failure to justify such price to the satisfaction of the Department will result in payment, as determined by the Department and/or Consultant, for the actual cost of complete demobilization, with the remainder of this item being payable in the final application for payment. The Department's determination of the actual costs for this item is not subject to appeal.

3) The Owner shall bear no additional costs incurred by the Contractor due to demobilization and/or remobilization due to severe storm events which may occur during construction. Should the contractor demobilize with portions of the work remaining incomplete, payment will only be made for those portions of the work that have been completed and approved by the Department and/or Consultant per the specifications.

2. **Section B: Sheet Piling Structures**

a. Item 06 - Mandrel Fabrication and Mobilization for Heavy Composite Sheet Piling

1) Payment shall be based on fabricating and mobilizing a mandrel, suitable for Heavy Fiber Reinforced Polymer (FRP) Composite sheet pile installation, and maintaining the presence of the mandrel at the project site. The Contractor shall mobilize the mandrel upon mobilization of the Heavy FRP Composite

sheet piling, and shall keep the mandrel at the site through the installation period, unless otherwise approved by the Department and/or Consultant.

b. Item 07 - Mandrel Mobilization for Light Composite Sheet Piling

1) Payment shall be based on mobilizing a mandrel, suitable for Light Fiber Reinforced Polymer (FRP) Composite sheet pile installation, and maintaining the presence of the mandrel at the project site. The Contractor shall mobilize the mandrel upon mobilization of the Light FRP Composite sheet piling, and shall keep the mandrel at the site through the installation period, unless otherwise approved by the Department and/or Consultant.

c. Item 08 - Heavy Composite Sheet Piling

1) Payment will be made as a unit price (Square Foot) for costs associated with or incidental to sheet piling wall installation for the Heavy FRP Composite sheet pile wall sections as shown in the Project Drawings and described in the Specifications. Specifically, this includes but is not limited to material purchase and delivery, labor, and equipment required to install the sheet piling. However, this item does not include the additional cost of installing sheet piling with a mandrel where necessary.

2) Payment shall be based on the square footage of sheet piling wall as determined by wall feature survey (installed wall length), recorded installation depth, and approved by the Department and/or Consultant. The Contractor will not receive payment for defective sheet pile or materials placed outside of the proposed structure area.

d. Item 09 - Mandrel Driving for Heavy Composite Sheet Piling (Additional Labor for Installation Only)

1) Payment shall be made as a unit price (Square Foot) of Heavy FRP Composite sheet piling wall installed with the aid of the mandrel if and as necessary only. This item defines payment for only ***additional labor*** required to install Heavy RFP Composite sheet piling using mandrels, as payment for equipment and material is covered under Items 6 and 8.

2) The Contractor shall document the driving records as required by SECTION 31 41 16 – Sheet Piling and shall track the square footage of mandrel driving for the additional payment.

e. Item 10 - Concrete Cap for Heavy Composite Sheet Piling

1) Payment shall be made as a unit price (Cubic Yards) for constructing the concrete cap structures associated with the Heavy FRP Composite sheet piling walls as shown in the Project Drawings.

2) This item includes full compensation for material purchasing; transportation of materials to the project area; formwork, reinforcing, concrete, concrete cap construction, equipment and operations; submittals; surveys; and all other appropriate costs and operations necessary to properly construct the concrete cap as shown in the Project Drawings and in accordance with the Contract Documents.

3) Payment shall be based on the cubic yardage of concrete cap as determined by wall feature surveys (length of cap) and approved by the Engineer. Payable segments shall meet the structure requirements (cap section

dimensions, etc.) outlined in SECTION 03 30 00 – Cast-in-Place Concrete and as shown in the Project Drawings. The Contractor will not receive payment for defective cap materials or materials placed outside of the proposed structure area.

f. Item 11 - Timber Cap for Heavy Composite Sheet Piling

1) Payment shall be made as a unit price (Linear Feet) for constructing the timber cap associated with the Heavy FRP Composite sheet piling walls as shown in the Project Drawings. Quantities for the double-sided timber cap shall be measured as a unit of 1 linear foot along the center of the sheet piling wall per every 2 linear feet of double-sided timber cap. For example, the Bid Item includes 300 linear feet (measured along the sheet piling wall centerline) which equates to 600 linear feet of timber cap.

2) This item includes full compensation for material purchasing; transportation of materials to the project area; cap installation; submittals; surveys; and all other appropriate costs and operations necessary to properly construct the timber cap as shown in the Project Drawings and in accordance with the Contract Documents.

3) Payment shall be based on the linear feet of timber cap as described above and determined by wall feature surveys (wall length) and approved by the Engineer. Payable segments shall meet the structure requirements outlined in SECTION 31 41 16 – Sheet Piling. The Contractor will not receive payment for defective cap materials or materials placed outside of the proposed structure area.

g. Item 12 - Light Composite Sheet Piling

1) Payment will be made as a unit price (Square Foot) for costs associated with or incidental to Light FRP Composite sheet piling wall installation as shown in the Project Drawings and described in the Specifications. Specifically, this includes, but is not limited to, material purchase and delivery, labor, and equipment required to install the sheet piling. However, this item does not include the additional cost of installing sheet piling with a mandrel.

2) Payment shall be based on the square footage of sheet piling wall as determined by wall feature surveys (wall length) and recorded installation depths, and approved by the Engineer. The Contractor will not receive payment for defective sheet pile or materials placed outside of the proposed structure area.

h. Item 13 - Mandrel Driving for Light Composite Sheet Piling (Additional Labor for Installation Only)

1) Payment shall be made as a unit price (Square Foot) of Light FRP Composite sheet piling wall installed with the aid of the mandrel, if and as necessary only. This item defines payment for only ***additional labor*** required to install sheet piling using mandrels, as payment for equipment and material is covered under Items 7 and 12.

2) The Contractor shall document the driving records as required by SECTION 31 41 16 – Sheet Piling and shall track the square footage of mandrel driving for the additional payment.

i. Item 14 - Concrete Cap for Light Composite Sheet Piling

1) Payment shall be made as a unit price (Cubic Yards) for constructing the concrete cap structures associated with the Light FRP Composite sheet piling walls as shown in the Project Drawings.

2) This item includes full compensation for material purchasing; transportation of materials to the project area; concrete cap construction, formwork, reinforcing, concrete, equipment and operations; submittals; surveys; and all other appropriate costs and operations necessary to properly construct the concrete cap as shown in the Project Drawings and in accordance with the Contract Documents.

3) Payment shall be based on the cubic yardage of concrete cap as determined by wall feature surveys (wall length) and approved by the Engineer. Payable segments shall meet the structure requirements (cap section dimensions, etc.) outlined in SECTION 03 30 00 – Cast-in-Place Concrete and as shown in the Project Drawings. The Contractor will not receive payment for defective cap materials or materials placed outside of the proposed structure area.

3. **Section C: Rock Stabilization Structures**

a. Item 15 - Marine Mattress

1) Payment will be made as a unit price (Square Footage) for Work associated with the marine mattress placement. Payment shall include costs associated with all required materials (e.g., marine mattress geogrid container, geotextile underlayment, stone fill, etc.), mattress unit assembly, transportation of materials to the Work site, excavation and foundation preparation, and placement of marine mattress units as shown in the Project Drawings and in accordance with the Contract Documents.

2) Payment shall be based on the square footage of marine mattresses successfully installed as determined by feature surveys and approved by the Engineer. Payable area shall meet the marine mattress requirements outlined in SECTION 35 31 17 – STONE PLACEMENT (required excavation/depth, slopes, allowable tolerances, etc.). The Contractor will not receive payment for defective materials or materials not installed in accordance with the contract documents.

b. **Item 16 – Stone (Core Stone and Armor Stone)**

1) Payment will be made as a unit price (Tons) for Work associated with all core and armor stone placement. Payment shall include costs associated with various core and armor stone materials, transportation of materials to the Work site, and placement of stone as shown in the Project Drawings and in accordance with Contract Documents.

2) Payment shall be based on the volume of rock placed as determined by bathymetric and topographic surveys and approved by the Department and/or Consultant. Payment quantities shall be determined by the Contractor and verified by the Department's Consultant using average end area method of calculation, or other method as approved by the Department and/or Consultant, a standard structure porosity of 35%, and unit weight/specific gravity as specified in the Contractor's Stone Product Data submittal. The Department may also approve alternative methods of payment such as certified weight tickets of stone delivered to the site. Payable volume shall meet the structure requirements outlined in SECTION 35 31 17 – STONE PLACEMENT (structure limits, required excavation/depth, slopes, allowable

tolerances, rock size gradation, etc.). The Contractor will not receive payment for rock materials placed outside of the proposed structure footprints or areas.

4. **Section D: Dredging and Earthwork**

a. Item 17 - Upland Excavation and Grading

1) Payment will be as a lump sum (LS) for full compensation for upland excavation and establishing final grading as shown in the Project Drawings and as described in the Specifications.

2) The lump sum payment will be payable as the estimated percentage of completion requested by the Contractor and field verified by the Engineer. Payable volume shall meet the requirements outlined in Section 31 23 00 Excavation and Grading. The Contractor will not receive payment for materials placed outside of the allowable tolerances or outside of the proposed placement areas.

b. Item 18 - Dredging, Beach Fill & Grading

1) Payment will be made as a unit price (Cubic Yards) for all costs associated with or incidental to hydraulic dredging, beach fill placement and grading, as shown in the Project Drawings and described in the Contract Documents.

2) Payment shall be full compensation for dredging, beach fill placement and grading operations. This shall include operation of the dredge; operation of support vessels and tugs; transport and movement of pipeline; dredged sand placement and grading within the project area; environmental protection; and all other operations necessary to properly dredge and fill the areas shown in the Project Drawings and Specifications.

3) Payment shall be based on the volume of excavation cut below the existing grade as determined by pre-dredging and post-dredging bathymetric surveys and accepted by the Department. Payable volume shall meet the spatial and depth requirements outlined in SECTION 35 20 23 – HYDRAULIC DREDGING AND BEACH FILL (limits of dredging, required depth, allowable overdepth, and side slopes). The Contractor will not receive payment for materials dredged outside of these limits.

1.10 DEFECTIVE WORK

A. The Contractor shall replace the Work, or portions of the Work, not conforming to specified requirements as directed by the Engineer.

B. If, in the opinion of the Department, it is not practical to remove and replace the Work, the Department or Consultant will direct one of the following remedies:

1. The defective Work may remain, but the unit or lump sum price for the item will be adjusted to a new price. The adjustment will be performed at the sole discretion of the Department. The determination for the adjustment will be made by the Department, whose determination will be final.

2. The defective Work will be partially repaired to the instructions of the Department or its Consultant, and the unit or lump sum price will be adjusted to a new price at the sole discretion of the Department. The determination for the adjustment will be made by the Department or Consultant, whose determination will be final.

C. The individual specification sections may modify these options or may identify a specific formula or percentage sum/price reduction.

D. The authority of the Department to assess the defect and identify payment adjustment is final.

E. Payment will not be made for any of the following:

1. Products wasted or disposed of in a manner that is not acceptable.

2. Products determined as unacceptable before or after placement.

3. Products damaged in transit, during handling, or due to improper storage.

4. Products not completely unloaded from the transporting vehicle.

5. Products placed and work performed beyond the lines and levels of the required Work.

6. Products remaining on hand after completion of the Work.

7. Removing, demolishing, and disposing of rejected Work.

8. Loading, hauling, and disposing of rejected Products.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.01 PAYMENT PROCEDURES

A. Requesting Progress Payment

1. Provide hard copies of supporting invoices and quantity measurements to support all requested earnings. Ensure that sum of payment activities do not exceed the Total Compensation.

2. Payment applications shall also meet all requirements of the Agreement between the Contractor and Department.

B. Options and Modification

1. When additional work is added by modification, existing funding amounts must be updated, or new line items for modification will be created. If Agreement has option line item not yet awarded, option line item will appear as zero dollars until option is awarded by modification. No payment may be requested for Options or Modification until a Change Order has been funded and signed.

--END OF SECTION--

SECTION 01 31 00

PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.01 SUMMARY

A. The Contractor shall manage the project and coordinate all activities of own employees, subcontractors, suppliers and offsite fabricators. The Contractor shall use computers, e-mail, and internet resources for administrative work and notify Engineer of important meetings, schedule events, and activities. The Contractor shall furnish labor, materials, and equipment required to plan and execute project management functions.

B. The Contractor shall coordinate activities and manage resources to construct the Project conforming to the Contract Documents, on time and within budget.

1.02 SUBMITTALS

The following submittals shall be submitted in accordance with SECTION 01 33 00 SUBMITTAL PROCEDURES. Bring the following administrative submittal items to Preconstruction Meeting:

A. List of Subcontractors

1. Submit a list of proposed subcontractors with company name, person to contact, street address, mail address, email address, phone number, type of specialty and estimated subcontract quote.

B. Signature of Authority

1. Furnish a power of attorney or a notarized letter of authority from Contractor identifying local representatives authorized to sign contract documents.

1.03 COORDINATION OF PUBLIC INFORMATION

A. The Contractor shall provide schedule and progress information to the Owner and Engineer for dissemination to the public throughout the project.

1.04 PROJECT COORDINATION

A. Coordinate scheduling, submittals, and Work to ensure efficient and orderly sequence of installation of interdependent construction elements.

B. Coordinate completion and cleanup of Work of separate sections in preparation for Substantial Completion and for portions of Work designated for Owner’s partial occupancy.

C. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

D. Work by Others

1. During construction period, others may perform construction or maintenance work within construction limits. The Contractor shall coordinate work by others with Engineer and the Owner and schedule activities to avoid problems at no additional cost.

1.05 PROJECT MEETINGS

A. The Engineer and the Owner require the following types of project meetings, all of which are described below:

1. Pre-Construction Meeting

2. Coordination Meeting

3. Construction Progress Meetings

B. Preconstruction Meeting

1. The Engineer will conduct a Preconstruction Meeting for this project. The Preconstruction Meeting will occur after Notice of Award (NOA) but prior to Notice to Proceed (NTP). (Refer to subparagraph "Preconstruction Meeting Submittals" below.) The Engineer will notify Contractor of time, place, and agenda. Contractor shall notify key subcontractors and suppliers to attend. The Engineer will discuss contract "ground rules" and general issues including:

a. Lines of Engineer authority

b. Lines of Contractor authority

c. Agreement Administration

d. Agreement Terms and Conditions

e. Supplemental Instructions

f. Construction Administration

g. Progress Payment

h. Correspondence Procedures

i. Project Schedule

j. Submittal Register

k. General Site Safety

2. Preconstruction Meeting Attendees

a. Permit Authority Representatives

b. Engineer Representatives

c. Owner Representatives

d. Contractor Representatives

3. Preconstruction Meeting Minutes

a. The Engineer will take detailed minutes of the Pre-Construction Meeting and may use an audio or video tape. Copies of typed minutes will be provided to the Contractor within five working days after the meeting. Audio or video tapes if used will be made available for the Contractor to review and for the permanent file.

4. Preconstruction Meeting Submittals

a. The timing of submission of submittals and completion of the Pre-Construction Meeting is intended to allow the Contractor, Engineer, and the Owner adequate time to prepare for commencement of work. However, should the Contractor fail to submit required items within the times stated, the Owner may issue NTP prior to receipt of submittals and prior to the Pre-Construction Meeting. If the NTP is issued prior to the Contractor's compliance with submittal requirements and prior to the Pre-Construction Meeting, the Contractor will not be permitted to commence work until these requirements have been satisfied. Any delays attributable to the Contractor's failure to comply with these pre-work requirements shall be at the Contractor's expense and may be cause for remedial action by the Engineer or Owner. Submittals required by this Section are described in paragraph SUBMITTALS above.

5. Division 01 Submittals required before or during Pre-Construction Meeting:

a. The Contractor shall review the submittal register (SECTION 01 33 00A) and provide all required Pre-Construction submittals before or during the Pre-Construction Meeting. The Contractor shall also review all applicable sections to confirm the required composition and transmittal of submittal items.

6. Divisions 02 through 35 Submittals

a. In addition to the above, bring submittal items for materials, workmanship, plans, or events required early in project schedule that are ready for transmittal to Engineer. Prepare transmittal of submittal items in accordance with SECTION 01 33 00 SUBMITTAL PROCEDURES.

7. Notice To Proceed (NTP)

a. NTP will be issued according to the Contract Documents and Agreement. If the Contractor has failed to submit specified pre-construction submittals or plans, or has not yet received the Engineer's conditional approval to work under an interim plan, the Contractor shall not proceed with the work and shall consider the work to be suspended in accordance with the Agreement. While the Contractor is working under a conditionally accepted interim plan, funds may be retained from progress payments in accordance with the Agreement and Contract Documents until the Contractor submits an acceptable plan. If the Contractor does not submit an acceptable plan within a reasonable time, as determined by the Engineer, the Engineer may order the Contractor to suspend work. Any suspension order issued for the Contractor's failure to submit an acceptable plan will not constitute unreasonable delay under the Agreement and the Contractor will not be entitled to an equitable adjustment of either performance period or contract price.

C. Coordination Meeting

1. The Coordination Meeting is scheduled, convened, and conducted by Engineer after a Pre-Construction Meeting and prior to starting physical construction. Draft plans submitted after

NOA (e.g., Construction Schedule, Submittal Register, Environmental Protection Plan, and Quality Control Plan) will have been reviewed. Coordination Meeting is primarily for on-site Contractor Quality Control staff, including subcontractor and supplier employees performing quality control, to meet and discuss the project in detail. Purposes of Coordination Meeting are:

a. Achieve mutual understanding with Contractor of required Quality Control

b. Jointly review submitted draft plans; resolve issues of concern

c. Discuss project plans and specifications, schedule, documentation

d. Establish a good working relationship between the Contractor's Quality Control Staff and Quality Assurance Representatives

D. Construction Progress Meetings

1. Construction progress meetings will occur on-site in the job-trailer provided by the Contractor or another near-site location agreed to by all parties. The Engineer will schedule the frequency, day of the week and time of the meetings. Meetings will generally occur once every two weeks. As project activities increase ("ramp up"), a minimum of one construction progress meeting per week is typical of a project of this scope. The Engineer will notify the Contractor when and if construction progress meetings will convene weekly. The Contractor will attend additional meetings as required, or when requested by Engineer.

2. The Contractor will preside over construction progress meetings and will notify any persons who need to be present to discuss agenda issues. Engineer may request Contractor to coordinate attendance by key Contractor suppliers, or fabricators as needed. A sample meeting agenda is provided in paragraph "GENERAL MEETING REQUIREMENTS" below.

3. The Contractor will take detailed minutes of each Construction Project Meeting and may use an audio or video tape. Copies of typed minutes will be provided to the Engineer to review within three working days of each meeting. Audio or video tapes if used will be made available for the Engineer to review and for the permanent file.

4. Progress Meeting Participants typically include:

a. Engineer

b. Owner Representatives

c. Contractor's Site Superintendent

d. Contractor's Quality Control Manager

e. Contractor's Safety Coordinator

f. Subcontractors, as appropriate to the agenda

g. Suppliers, as appropriate to the agenda

h. Others as appropriate to the agenda

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.01 GENERAL MEETING REQUIREMENTS

A. Contractor is responsible for phase and construction progress meetings to include:

1. Meeting notification to participants
2. Prepare agenda for meetings
3. Physical arrangements for meetings
4. Preside at meetings
5. Record minutes to document proceedings and decisions
6. Copy and send minutes to:
    a. Meeting participants
    b. Project parties affected by decisions
    c. Engineer (No later than 3 working days after meeting occurs)

B. PROGRESS MEETING AGENDA

Modify agenda as needed for on-going work.

1. Review key issues from previous progress meetings
2. Review work progress since previous meeting
3. Review current definable features of work:
    a. Identify phases of current features of work
    b. Identify pending phase changes
    c. Identify features for discussion in next scheduled meeting
4. Discuss problem prevention:
    a. Field observations
    b. Deficiencies and tracking
    c. Procedures working well
    d. Problems, conflicts
    e. Methods to improve

5. Review construction schedule:
    a. Identify delays
    b. Discuss proposed corrective actions to regain schedule
6. Submittals and Requests for Information (design interpretation):
    a. Review submittal register
    b. Identify submittals to expedite as required
7. Review off-site activities:
    a. Fabrications
    b. Material and equipment delivery schedule
8. Review Testing:
    a. Type, Schedule
    b. Received Results
9. Review changes to construction schedule:
    a. Planned progress during succeeding work period
    b. Coordination of various schedules
    c. Effect of changes on construction and completion date
10. Review site safety
11. Discuss maintaining contract quality for materials and workmanship
12. Discuss pending modifications, changes and substitutions
13. Discuss other business, as appropriate

-- END OF SECTION --

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

A. This section includes additional requirements and procedures for submittals including shop drawings, product data, samples, or other submittals relating to products, and as specified in individual sections and General Conditions, Article 24.

B. The Contractor shall submit all items listed in this and other Sections of these Specifications. The Department or its Consultant may request submittals in addition to those listed when deemed necessary to adequately describe the Work covered in the respective sections. Units of weights and measures used on all submittals shall be the same used in the Project Drawings. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with Contract requirements. Prior to submittal, all items shall be checked and approved by the Contractor's Quality Control (CQC) representative and each item shall be stamped, signed, and dated by the CQC representative indicating action taken. Proposed deviations from the Contract requirements shall be clearly identified. Submittals shall include items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves; test reports; test cylinders; samples; Operation and Maintenance manuals including parts list; certifications; warranties and other such required submittals. Submittals requiring Department and /or Consultant's review and acceptance shall be scheduled and made prior to the acquisition of the material or equipment covered thereby.

1.02 DEFINITIONS

A. Manufacturer's Instructions: Instructions, stipulations, directions, and/or recommendations issued in printed form by the manufacturer of a product addressing handling, installation, erection, and application of the product; Manufacturer's Instructions are not prepared especially for the Work.

B. Shop Drawings: 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. Shop drawings should provide the appropriate level of detail for the Contractor's field or fabrication shop personnel to use as the sole reference in building the referenced piece of the Work.

C. Product Data: Standard printed information on materials, products and systems; illustrations, standard schedules, performance charts, brochures, diagrams and other information to illustrate materials or equipment for some portion of the Work.

D. Samples: Physical examples, which illustrate materials, equipment, or workmanship and established standards by which the Work will be judged. Included are both fabricated and un-fabricated physical examples as complete units or as smaller portions of units available for either limited visual inspection or (where indicated) for more detailed testing and analysis.

E. Special Samples: Physical examples that illustrate materials, equipment, or workmanship and establish standards by which the Work will be judged, and will be incorporated in the Work.

F. Miscellaneous Submittals: Technical reports, administrative submittals, certificates, and guarantees not defined as shop drawings, product data, or samples.

1. 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.

2. Administrative Submittals are those nontechnical submittals required by the Contract Documents or deemed necessary for administrative records. These Submittals include statements of applicability, copies of industry standards, as-constructed data, security/protection/safety data, and similar type Submittals.

3. 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.

4. Reports as required by Contractor describing Contractor's means and methods for items such as dewatering, earth and water retaining, and erosion control.

1.03 SUBMITTALS

A. Final Submittal Register

1. Submit final submittal register in accordance with this specification for Department and Consultant's acceptance.

1.04 PROCEDURES

A. Before commencing work, the Contractor will review the Draft Submittal Register attached to this specification. The Contractor will review the Submittal Register and note any discrepancies or required additions. The reviewed Submittal Register will serve only as a guidance document for submission as the project proceeds. Optional submittals or other submittal requirements not listed on the Submittal Register but described in the rest of the Specifications may be required, and the Contractor shall provide these upon request of the Department or its Consultant.

B. Unless specifically required to deliver hard copies, Contractor shall deliver all submittals to the Department's Consultant in electronic format via email at the email addresses provided on the Project Drawings or during the bidding or pre-construction phase.

C. For submittal files too large to send via email, the Consultant will provide the Contractor with an ftp site to upload the electronic submittal.

D. For submittals that require the seal of a Professional Engineer or Professional Surveyor, the seal and signature shall be clearly visible, and stamped seals shall be preferable to embossed seals as they are more visible on digital documents.

E. When immediate contact is required herein, the Contractor shall contact the Consultant by telephone, unless otherwise instructed. A telephone record will be kept by the Consultant of all calls between the Contractor and Consultant and a copy provided to the Department's Project Manager and Contractor on a weekly basis.

F. Submit submittals in ample time, no less than 10 days, for review and response.

G. Submit submittals specified or reasonably required for construction, operation, and maintenance of the Work.

H. Deliver submittals under acceptable transmittal form which identifies:

1. Submittal date.

2. Project and Contractor.

3. Subcontractor and major supplier, when appropriate.

4. Reference submittal to Contract Documents by Drawing, detail, and/or Specification section numbers, as appropriate.

5. Variations from Contract Documents when variations are included in submittal.

6. Whether submittal requires review and acceptance or is for information only.

1.05 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

A. Submit Shop Drawings, Product Data, Samples, and other pertinent information in sufficient detail to show compliance with specified requirements.

B. Check, verify, and revise submittals as necessary to bring them into conformance with Contract Documents and actual field conditions.

1. Determine and verify quantities, dimensions, specified design and performance criteria, materials, catalog numbers, and similar data.

2. Coordinate submittal with other submittals and with the requirements of the Contract Documents.

C. After completion of checking, verification, and revising, sign and date submittals indicating review and approval, and submit to Engineer.

1. Signature indicates Contractor has satisfied shop drawing review responsibilities and constitutes Contractor's written approval of shop drawing.

2. Shop drawings without Contractor's written approval will be returned for resubmission.

D. Shop Drawings: Submit one (1) electronic copies. Consultant will return one (1) electronic copy with reviewer's comments and stamp.

E. Product Data and Manufacturer's Instructions: Excise or cross out non-applicable information and clearly mark applicable information with citations to and terminology consistent with Contract Documents. Consultant will return one (1) electronic copy with reviewer's comments and stamp.

F. Samples: Submit one (1) physical sample (unless otherwise directed) labeled with reference to applicable Contract Documents. Samples will not be returned unless return is requested in writing and an additional sample is submitted.

G. Special Samples: Submit one (1) sample for each proposed product labeled with reference to applicable Contract Documents. Sample will be returned for installation in the Work.

H. See Article 24, Paragraph 24.02 General Conditions

1.06 MANUFACTURER'S INSTRUCTIONS

A. Submit manufacturer's instructions whenever available and when installation, erection, or application in accordance with manufacturer's instructions is required by the Specifications.

B. Submit manufacturer's instructions prior to installation, erection, or application of equipment and other project components. Submit manufacturer's instructions in accordance with requirements for Product Data.

1.07 DEPARTMENT AND/OR CONSULTANT'S REVIEW (SEE ARTICLE 24 GENERAL CONDITIONS)

A. Except as may be provided in these specifications, a submittal will be returned within 10 business days. When a submittal cannot be returned within that period, Engineer will, within a reasonable time after receipt of the submittal, give notice of the date by which that submittal will be returned.

B. For submittals returned Accepted – No further action is required by the Contractor for this submittal; Contractor shall pursue with the Work described by this submittal.

C. For submittals returned Rejected – See All Comments, Contractor shall develop a new submittal package with materials, equipment, methods, etc. that meet the requirements of the Contract Documents.

D. For submittals returned Revise and Resubmit – Make Corrections Noted / See All Comments, Contractor shall incorporate the review comments into a complete revised package, and resubmit it for review.

E. For submittals returned Accepted as Noted – No further action is required by the Contractor for this submittal; however, Contractor shall incorporate comments into the Work described by this submittal.

F. For submittals returned Resubmittal Not Required – Make Corrections Noted / See all Comments, Contractor shall incorporate all review comments into the work, but resubmittal of an amended submittal package is not required.

G. For submittals returned Submittal Not Required – Returned without Review, File for Record, no further action is required by the Contractor for this submittal.

H. For submittals returned Submittal Received, for Information Only – File for Record, no further action is required by the Contractor for this submittal.

I. For submittals returned Submit Specified Item – Contractor shall develop a new submittal package with the specified item.

J. Department's Consultant will be entitled to rely upon the accuracy or completeness of designs, calculations, or certifications made by licensed professionals accompanying a particular submittal whether or not a stamp or seal is required by Contract Documents or Laws and Regulations.

K. For submittals returned Rejected or Revise and Resubmit, the Contractor shall submit the subsequent submittal in its entirety to ultimately create one accepted submittal document. Submitting partial submittal data as a response to specific questions/comments will not be acceptable, and the Department or its Consultant reserves the right to reject such partial submittals.

L. Subsequent submittals shall contain the same submittal number as the original submittal; however, the Contractor shall append a suffix number or letter to the subsequent submittal number to identify it as subsequent to the original submittal.

M. Costs incurred by Department as a result of additional reviews of a particular submittal after the third time it has been reviewed, shall be borne by Contractor at a rate of $500.00 per subsequent submittal review or the Consultant's actual time spent reviewing the submittal, whichever is greater. Reimbursement to Department will be made by deducting such costs from Contractor's subsequent payments.

1.07 MINOR OR INCIDENTAL PRODUCTS AND EQUIPMENT SCHEDULES

A. Shop Drawings of minor or incidental fabricated products will not be required, unless requested.

B. If requested by the Department or its Consultant, submit tabulated lists of minor or incidental products showing the names of the manufacturers and catalog numbers, with Product Data and Samples as required to determine acceptability.

1.08 SCHEDULING

A. Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. Certifications to be submitted with the pertinent Project Drawings shall be so scheduled. Adequate time, a minimum of ten (10) calendar days, shall be allowed on the Submittal Register for review and acceptance. No delays, damages, or time extensions will be allowed for time lost in late submittals.

1.09 DEVIATIONS

A. The Contractor shall set forth in writing the reason for any deviations and annotate such deviations on the submittal. The Department reserves the right to rescind inadvertent approval or acceptance of submittals containing unnoted deviations.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.01 SUBMITTAL REGISTER

A. A Draft Submittal Register listing each item of material or equipment for which submittals are required by the Specifications is appended to this Section. The list may not be all-inclusive and additional submittals may be required. The Contractor shall complete and return an electronic copy of the Submittal Register to the Department and its Consultant for review and acceptance within ten (10) business days after the Notice to Proceed has been issued. The approved Submittal Register will become the scheduling document and will be used to control submittals throughout the life of the Contract. The register and the progress schedules shall be coordinated. After initial acceptance of the Contractors' Submittal Register, the Contractor shall submit an electronic copy of the revised and/or updated Submittal Register, as part of the monthly payment application to the Department and its Consultant as necessary. The appended Submittal Register is an Excel-based spreadsheet. The Department's Consultant will provide an electronic version of this document to the Contractor upon request.

3.02 SUBMITTALS KNOWN TO BE UNACCEPTABLE

A. The Contractor shall contact the Department and its Consultant immediately regarding construction/testing submittals that have failed tests criteria or are otherwise unacceptable.

-- END OF SECTION --

PROJECT NAME: Norriego Point Stabilization and Restoration Project													CONTRACTOR:
			TYPE			CONTRACTOR ACTION/SCHEDULE DATES				ENGINEER ACTION		REMARKS	
TRANSMITTAL NO	SPEC. SECTION NO.	DESCRIPTION OF ITEMS SUBMITTED	PRECONSTRUCTION SUBMITTAL	ENGINEER ACCEPT.	INFORMATION ONLY	REVIEWER	SUBMISSION DATE	APPRV NEEDED BY	MATL NEEDED BY	DATE	APPROVAL CODE	APPROVAL CODES: AP- *APPROVED AS SUBMITTED* AC- *APPROVED AS CORRECTED* RR- *REVISE AND RESUBMIT, MAKE CORRECTIONS NOTED* *RJ - REJECTED, DEVELOP REPLACEMENT* NR- SUBMITTAL NOT REQUIRED-RETURNED WITHOUT REVIEW IO - SUBMITTAL RECEIVED FOR INFORMATION ONLY SI - SUBMIT SPECIFIED ITEM	
SECTION 00 73 19 SAFETY AND OCCUPATIONAL HEALTH													
01	00 73 19	Accident Reports (if required)			X								
SECTION 01 29 00 MEASUREMENT AND PAYMENT													
02	01 29 00	Schedule of Values	X	X									
03	01 29 00	Construction Schedule	X	X									
04	01 29 00	Revised Construction Schedules		X									
SECTION 01 31 00 PROJECT MANAGEMENT AND COORDINATION													
05	01 31 00	List of Subcontractors	X		X								
06	01 31 00	Signature of Authority	X		X								
SECTION 01 33 00 SUBMITTAL PROCEDURES													
07	01 33 00	Submittal Register	X	X									
SECTION 01 35 43 ENVIRONMENTAL PROTECTION													
08	01 35 43	Environmental Protection Plan	X	X									
09	01 35 43	Erosion and Turbidity Control Plan	X		X								
10	01 35 43	Copy of Project Permits	X		X								
11	01 35 43	Project Environmental Summary Report/Sheet			X								
SECTION 01 45 16 CONTRACTOR QUALITY CONTROL													
12	01 45 16	Quality Control Plan	X	X									
13	01 45 16	Registered Surveyor/Mapper's Qualifications	X	X									
14	01 45 16	Geotechnical/Construction Materials Testing Company Qualificiations	X	X									
15	01 45 16	Preparatory and Initial Phase Checklists			X								
16	01 45 16	Quality Control Logs			X								
SECION 01 50 00 TEMPORARY FACILITIES AND CONTROLS													
1	01 50 00	Moblization / Demolization Plan	X		X								
02	01 50 00	Security Plan	X		X								
03	01 50 00	Hurricane and Severe Storm Plan	X		X								
04	01 50 00	Temporarty Facility Shop Drawings	X	X									
SECTION 01 77 00 PROJECT CLOSEOUT													
17	01 77 00	Record Drawings		X									
18	01 77 00	As-Built Drawings		X									
19	01 77 00	Request for Inspection			X								

PROJECT NAME: Norriego Point Stabilization and Restoration Project													CONTRACTOR:
			TYPE			CONTRACTOR ACTION/SCHEDULE DATES				ENGINEER ACTION		REMARKS	
TRANSMITTAL NO	SPEC. SECTION NO.	DESCRIPTION OF ITEMS SUBMITTED	PRECONSTRUCTION SUBMITTAL	ENGINEER ACCEPT.	INFORMATION ONLY	REVIEWER	SUBMISSION DATE	APPRV NEEDED BY	MATL NEEDED BY	DATE	APPROVAL CODE	APPROVAL CODES: AP- *APPROVED AS SUBMITTED* AC- *APPROVED AS CORRECTED* RR- *REVISE AND RESUBMIT, MAKE CORRECTIONS NOTED* *RJ - REJECTED, DEVELOP REPLACEMENT* NR- SUBMITTAL NOT REQUIRED-RETURNED WITHOUT REVIEW IO - SUBMITTAL RECEIVED FOR INFORMATION ONLY SI - SUBMIT SPECIFIED ITEM	
SECTION 03 30 00 CAST-IN-PLACE CONCRETE													
20	03 30 00	Cast-in-Place Concrete Mixture Design	X	X									
21	03 30 00	Concrete Mix Materials	X	X									
22	03 30 00	Concrete Curing Materials and Methods	X	X									
23	03 30 00	Steel Reinforcement and Shop Drawings	X	X									
24	03 30 00	Ancillary Materials	X	X									
25	03 30 00	Concrete Testing Reports			X								
26	03 30 00	Notice Ready for Inspection			X								
SECTION 31 41 16 FRP (FIBER REINFORCED POLYMER) SHEET PILING													
27	31 41 16	Sheet Piling Installation Method and Equipment	X	X									
28	31 41 16	Sheet Piling Material Data	X	X									
29	31 41 16	Driving Records		X	X								
30	31 41 16	As-Built Survey of Sheet Piling Walls		X									
SECTION 35 20 23 HYDRAULIC DREDGING AND BEACH FILL													
31	35 20 23	Hydraulic Dredging and Material Transfer Plan	X	X									
32	35 20 23	Maintenance of Marine Traffic Plan	X	X									
33	35 20 23	Notice to Mariners	X		X								
34	35 20 23	Notification of Aids to Navigation Relocation/Dredging Aids	X		X								
35	35 20 23	Pre-Dredging Bathymetric Survey	X	X									
36	35 20 23	Daily Dredging Report of Operations			X								
37	35 20 23	Notification of Discovery of Historical Resources			X								
38	35 20 23	Equipment Inventory Record			X								
39	35 20 23	Notice of Misplaced Material			X								
40	35 20 23	Post-Construction Bathymetric Survey		X									
41	35 20 23	Quality Control Sand Samples			X								
SECTION 35 31 17 STONE PLACEMENT FOR SHORELINE STABILIZATION													
42	35 31 17	Stone Product Data	X	X									
43	35 31 17	Geotextile Underlayment Product Data	X	X									
44	35 31 17	Stone Placement Plan	X	X									
45	35 31 17	Marine Mattress Geogrid Material and Shop Drawings	X	X									
46	35 31 17	Alternate Marine Mattress Geogrid Material and Shop Drawings (if required)	X	X									
47	35 31 17	Armor Stone Weight Test	X	X									
48	35 31 17	Restoration Plan (as necessary)		X	X								
49	35 31 17	Certified Rock Quantity			X								
50	35 31 17	As-Built Survey		X									

SECTION 01 35 43

ENVIRONMENTAL PROTECTION

PART 1 GENERAL

1.01 SUMMARY

A. This section covers prevention of environmental pollution and damage as the result of construction operations under this contract and for those measures set forth in other Technical Requirements of these specifications. For the purpose of this specification, environmental pollution and damage are defined as the presence of hazardous, physical, chemical, or biological elements or agents, which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species, biological communities, or ecosystems of importance to man; or degrade the utility or quality of the environment for aesthetic, cultural, and/or historical purposes. The control of environmental pollution and damage requires consideration of air, water, and land, and includes management of visual aesthetics, noise, solid waste, radiant energy and radioactive materials, as well as other pollutants.

1.02 QUALITY CONTROL

A. The Contractor shall establish and maintain quality control for environmental protection of all items set forth herein. Contractor shall record on daily quality control reports or attachments thereto, any problems in complying with permits, laws, regulations and ordinances, and corrective action taken.

1.03 REFERENCES

A. Miscellaneous Environmental Laws and Regulations

There are numerous environmental laws and regulations. At the Federal level, the applicable laws and regulations include compliance with the Clean Water Act (CWA); Clean Air Act (CAA); Coastal Zone Management Act (CZMA); Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); Endangered Species Act (ESA); Fish and Wildlife Coordination Act (FWCA); Marine Protection, Research, and Sanctuaries Act (MPRSA); Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA); National Environmental Policy Act (NEPA); National Historic Preservation Act (NHPA); National Pollution Discharge Elimination System (NPDES); Research and Sanctuaries Act; Native American Graves Protection and Repatriation Act (NAGPRA); Resource Conservation and Recovery Act (RCRA); Rivers and Harbors Act (R&H); Safe Drinking Water Act (SDWA); Toxic Substance Control Act (TSCA); Wild and Scenic Rivers Act (WSRA); Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA); Marine Mammal Protection Act (MMPA); Code of Federal Regulations (CFRs); Executive Orders; and, Environmental Protection Agency (EPA) requirements. NEPA compliance measures specified in an Environmental Assessment (EA), Biological Opinion (BO), or Environmental Impact Statements (EIS) are also applicable with regard to compliance.

B. Publication Reference(s)

The publication(s) listed below form(s) a part of this specification to the extent referenced. The publication(s) are referred to in the text by basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	U.S. Army Corps of Engineers Safety and Health Requirements Manual

1.04 PERMITS AND AUTHORIZATIONS

A. Contractor shall comply with all requirements under the terms and conditions set forth in the following environmental permits and authorizations and related documents for this project:

Norriego Point Stabilization (Appendix A)

- Florida Department of Environmental Protection Permit No. 0175572-003-JC, permit drawings, subsequent modifications, and notice to proceed
- U.S. Army Corps of Engineers Department of Army Permit No. SAJ-2-12-00702, permit drawings, and attachments

East Pass and Destin Harbor Maintenance Dredging (Appendix B)

- Florida Department of Environmental Protection Permit No. 0288799-003-JC, permit drawings, sediment quality control / quality assurance plan, variance, and subsequent modifications and attachments
- U.S. Army Corps of Engineers Department of Army Permit No. SAJ-2007-04911, permit drawings and attachments

B. Copies of these environmental permits and associated documents are appended to these Contract Documents. The Contractor shall familiarize himself and his personnel with these and any other permits required for this project and comply with all requirements under the terms and conditions set forth therein, including attached environmental protection conditions. The contractor shall be responsible for any fines resulting from violations of construction conditions set forth in the environmental permits. The Contractor shall include all costs for preparation and submittal of required reporting within each relative bid item.

C. It is the Contractor's responsibility to obtain any and all other relevant Federal, State and local permits at no cost to the Owner. The Contractor shall be responsible for any delays and costs resulting from failure to comply with these and all federal, state and local environmental protection laws and regulations.

D. The Contractor will be required to keep copies of all permits, complete with all conditions, attachments, modifications, and time extensions, as well as the plans and specifications at the project site(s) for the duration of the project.

1.05 SUBMITTALS

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

A. Environmental Protection Plan

Within 30 calendar days after the date of Notice of Award and at least 15 calendar days prior to the pre-construction conference, the Contractor shall submit in writing an Environmental Protection Plan. The Owner may, at its discretion, consider an interim plan for the first 30 days of operations. However, the Contractor shall furnish an acceptable final plan no later than 30 calendar days after receipt of Notice to Proceed. Acceptance of the Contractor's plan shall not

relieve the Contractor of its responsibility for adequate and continuing control of pollutants and other environmental protection measures. Acceptance of the plan is conditional and predicated on satisfactory performance during construction. The Department reserves the right to require the Contractor to make changes to the Environmental Protection Plan or operations if the Department or its Consultant determines that environmental protection requirements are not being met. No physical work at the site shall begin prior to acceptance of the Contractor's Plan or an interim plan covering the work to be performed. The Environmental Protection Plan shall include but not be limited to the following:

a. A list of federal, state, and local laws, regulations, and permits concerning environmental protection, pollution control, and abatement that are applicable to the Contractor's proposed operations and requirements imposed by those laws, regulations, and permits.

b. Methods for protection of features and resources to be preserved within authorized work areas. The Contractor shall prepare a list of methods to protect as appropriate resources needing protection, (including but not limited to) landscape features, surface and groundwater quality, air and water quality, submerged natural resources, fish and wildlife, historical, archeological, and cultural resources.

c. Procedures to be implemented to provide the required environmental protection and to comply with the applicable laws and regulations. This will include preventative actions and emergency compliance procedures in the event of an accident, spill, or other non-compliance event that occurs during the project period. The Contractor shall provide written assurance that immediate corrective action will be taken to correct pollution of the environment due to accident, natural causes, or failure to follow the procedure set out in accordance with the environmental protection plan.

d. Methods for protection of Endangered, Threatened, Protected, or other listed Species, including but not limited to marine sea turtles, manatees, smalltooth sawfish, gulf sturgeon, and nesting shorebirds.

e. Methods for protecting surface and ground water during construction activities.

f. A permit or license for (if required) and the location of the solid waste disposal area or facilities the contractor will use for disposal of solid wastes.

g. Drawings showing locations of any proposed temporary excavations or embankments for haul roads, stream crossing, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials (as applicable).

h. Traffic control plan (if applicable).

i. Spill Prevention Plan. The Contractor shall specify all potentially hazardous substances to be used on the job site and intended actions to prevent accidental or intentional introduction of such materials into the air, ground, water, wetlands, or drainage areas. The plan shall specify the Contractor's provisions to be taken to meet Federal, State, and local laws and regulations regarding labeling, storage, removal, transport, and disposal of potentially hazardous substances.

j. Spill Contingency Plan for hazardous, toxic, or petroleum materials.

k. Operational Plan to achieve protection of endangered species during dredge operations. The plan shall also detail any required daily/weekly submittals for endangered species or protection of submerged aquatic resources (e.g., seagrasses).

l. A statement identifying the Contractor's personnel who shall be responsible for implementation of the Environmental Protection Plan. The Contractor's personnel responsible shall report directly to the Contractor's top management and shall have the authority to act for the Contractor in all environmental protection matters.

m. Environmental monitoring plans for the job site, including land, water, air, and noise monitoring. Plans will include (but will not be limited to) descriptions of specific equipment, tools and instruments used to perform the monitoring, monitoring schedules, any subcontractors used for monitoring activities and any certifications, approval letters or other required documents for execution of specific monitoring activities.

n. Contractor must prepare and sign a Certification Letter acknowledging the Contractor has a copy of all environmental permits applicable to the project and understands the conditions in the permits. The Certification Letter shall be attached to the Environmental Protection Plan.

B. Erosion and Turbidity Control Plan

1. The Contractor shall submit an erosion and turbidity control plan a minimum of fourteen (14) days prior to start of construction

2. The plan shall include a general summary of the proposed measures (including construction sequencing) to control erosion of the existing shoreline or placed materials, and any turbidity resulting from construction activities. Plan components may include construction sequencing and best management practices such as the use of shore parallel dikes during dredge spoil discharge to control placed sediments and turbidity. The Contractor shall also address measures to reduce erosion and sedimentation into the Destin Harbor entrance channel, or other adjacent navigable waters, during construction operations. All proposed control measures shall be in accordance with permit conditions and requirements.

3. If it has been determined that any environmental resources have been damaged due to the lack of proper erosion control measures, the Contractor shall repair any damage and pay any fines at no additional cost to the Owner.

C. Copy of Project Permits

1. Submit a copy of each of the permits sought and received by the Contractor (if required).

D. Project Environmental Summary Report/Sheet

1. Within thirty (30) days of project completion, the Contractor shall submit a written report of the absence or occurrence of environmental incidents, including but not limited to endangered species encounters/sightings, fuel spills, discovered contaminants, etc. The purpose of this summary is to demonstrate compliance — as well as to summarize any deviations — from the conditions and requirements set forth in the project's environmental resource permits and these specifications.

1.06 SUBCONTRACTORS

A. Assurance of compliance with this section and all sections by subcontractors will be the responsibility of the Contractor.

1.07 TRAINING OF CONTRACTOR PERSONNEL IN POLLUTION CONTROL

A. Contractor shall train his personnel in all phases of environmental protection. The training shall include methods of detecting and avoiding pollution, familiarization with pollution standards, both statutory and contractual, and careful installation and monitoring of the project to ensure adequate and continuous environmental pollution control. Quality Control and supervisory personnel shall be thoroughly trained in the proper use of monitoring devices and abatement equipment, and shall be thoroughly knowledgeable of federal, state, and local laws, regulations, and permits as listed in the Environmental Protection Plan submitted by Contractor. Quality Control personnel will be identified in the Quality Control Plan submitted in accordance with SECTION 01 45 16 Contractor Quality Control.

1.08 NOTIFICATION OF NONCOMPLIANCE

A. The Department or its Consultant will notify the Contractor in writing of any observed noncompliance with the aforementioned federal, state, or local laws or regulations, permits and other elements of the Contractor's Environmental Protection Plan. The Contractor shall, after receipt of such notice, inform the Engineer of proposed corrective action and take such action as may be approved. If the Contractor fails to comply promptly, the Engineer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions shall be granted or costs or damages allowed to the Contractor for any such suspension.

B. Monitoring of permit and/or regulation compliance by the Engineer is for the sole benefit of the Owner and shall not relieve the Contractor of the responsibility of knowing and complying with all local, state, and federal laws and regulations concerning the protection of the environmental resources, nor does it relieve the Contractor of the responsibility of ensuring that all environmental permit requirements governing the project work are met.

C. The Contractor shall notify the Department immediately, in writing, of the occurrence of environmental incidents and shall take immediate corrective action to manage and remedy the incident.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.01 PROTECTION OF ENVIRONMENTAL RESOURCES

A. General

1. The Contractor shall comply with all applicable federal, state, and local laws and regulations. The environmental resources within the project boundaries and those affected outside the limits of permanent work under this contract shall be protected during the entire period of this contract. Contractor shall confine his activities to areas defined by the drawings and specifications. Deviations from drawings or specifications (e.g., proposed alternate borrow areas, disposal areas, and staging areas) could result in the need for the Owner to reanalyze and re-approve the project from an environmental standpoint. Environmental protection shall be as stated in the following paragraphs. Failure to meet the requirements of these Specifications for environmental protection may result in Work stoppages or termination for default. No part of the time lost due to any such Work stoppages shall be made the subject of claims for extensions of time or for excess costs or damages by Contractor. If Contractor fails or refuses to promptly repair any damage caused by violation of provisions of these Specifications, the Department may have the necessary Work performed and charge the cost thereof to Contractor.

B. Protection of Land Resources

1. Before beginning any construction, Contractor shall identify all land resources to be preserved within Contractor's work area. Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and landforms without special permission from Engineer. Contractor shall engage a qualified tree surgeon to perform all tree surgery, and shall repair injuries to bark, trunk, branches, and roots of protected trees by dressing, cutting, and painting as specified for Class I Fine Pruning, of the National Arborist Association Pruning Standards for Shade Tree or as per State's Agricultural Extension Agency Guidelines, immediately as occurrences arise. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. Where such special emergency use is permitted, Contractor shall provide effective protection for land and vegetation resources at all times as defined in the following subparagraphs.

   a. Work Area Limits

      1) The Contractor’s field offices, staging areas, stockpile storage, and/or temporary buildings shall only be placed in approved areas shown on the Project Drawings. Temporary movement or relocation of the Contractor facilities shall be made only upon approval by the Department’s Project Representative.

      2) Prior to any construction, the Contractor shall mark the areas that are not required to accomplish all work to be performed under this contract. Isolated areas within the general work area that are to be saved and protected shall also be marked or fenced. Monuments and markers shall be protected before construction operations commence. Where construction operations are to be conducted during darkness, the markers shall be visible. The Contractor shall convey to his personnel the purpose of marking and/or protection of all necessary objects.

2. Protection of Landscape

   a. The Contractor shall protect from damage all existing trees and their roots, shrubs, vines, grasses, land forms, and other landscape features (indicated, defined, or delineated on the Drawings to be preserved) within or adjacent to the proposed work area. The Contractor shall preserve and protect any area(s) outside the immediate work area not defined as preservation or for work. Preserved areas shall be clearly identified and protected by fencing or any other approved techniques. Place landscape protection fencing before construction commences and maintain in place until construction is complete. Protection of tree and landscape roots shall be provided against noxious materials in solution caused by run-off or spillage. No materials, trailers, or equipment shall be stored within the drip line of any protected tree.

   b. The Contractor will be responsible for the replacement of any damaged landscape feature marked for preservation.

3. Unprotected Erodible Soils

   a. Earthwork brought to final grade shall be finished as indicated in the contract drawings. Side slopes and back slopes shall be protected as soon as practicable upon completion of grading. All earthwork shall be planned and conducted to minimize the duration of exposure of unprotected soils. Excavation and associated earthwork shall progress in reasonably sized increments as needed to use the areas developed as approved by the Engineer.

b. The contractor shall excavate, grade, and/or place dredge spoil within the project area as shown in the construction drawings in such a manner to minimize the potential for any re-entry or re-entrainment back into the inlet or the federal navigation channels of East Pass or Destin Harbor. The Contractor may be required to remove any materials eroded from the project area and deposited within the federal navigation channels, resulting from unprotected erodible soils or improper construction scheduling or planning, at no cost to the Owner.

4. Disturbed Areas

a. The Contractor shall effectively prevent erosion and control sedimentation through approved methods include, but are not limited to, the following:

1) Retardation and Control of Runoff: Runoff from the construction site or from storms shall be controlled, retarded, and diverted to protected drainage courses by means of diversion ditches, benches, and by any other erosion control measures necessary.

2) The Contractor shall select, implement, and maintain erosion and sediment control measures as required by local, state, and federal laws and regulations.

5. Contractor Facilities and Other Work Areas

a. Locate facilities, staging and other work areas as indicated in Section 01 50 00 TEMPORARY FACILITIES AND CONTROLS, and in compliance with regulatory permits for performance of work. Dredge areas shall be managed to minimize erosion and to prevent sediment from entering nearby watercourses, wetlands, or protected areas. Spoil areas shall be managed and controlled to limit spoil intrusion beyond the proposed fill or restoration areas designated on the drawings and to prevent erosion of soil or sediment from entering nearby watercourses, navigation channels, or protected areas. Spoil areas shall be developed in accordance with the grading plan indicated on the drawings. Temporary excavation and embankments for plant and/or work areas shall be controlled to protect adjacent areas from despoilment. If there is suspicion that sediment may be unsuitable for disposal at a specified location, the Contractor shall immediately take measures to contain the suspect sediment and notify the Department's Consultant.

6. Disposal of Solid Wastes

a. Solid wastes (excluding clearing debris) shall be placed in containers that are emptied on a regular schedule. All handling and disposal shall be conducted to prevent contamination. The Contractor shall transport all solid waste off the properties within the project limits and dispose of it in compliance with federal, state, and local requirements for solid waste disposal. Discarded materials other than those that can be handled in the solid waste category will be handled as directed by the Department's Project Representative..

7. Fuel, Oil, and Lubricants

a. Fuel, oil, and lubricants shall be managed so as to prevent spills and evaporation. At a minimum, environmental protection design requirements of storage tanks and equipment shall include the following: 1) stationary tanks and piping shall have secondary containment features; 2) corrosion protection; 3) system leaks shall be readily detected and contained without human intervention; and, 4) overfill containment systems shall be provided.

b. To prevent spills, dispensers shall have a 4-foot square, 16-gauge metal pan with borders banded up and welded at corners right below the bib. Edges of the pans shall be 8-inch minimum in depth to ascertain that no contamination of the ground takes place. Pans shall be cleaned by an approved method immediately after every dispensing of fuel and wastes disposed of offsite in an approved area. Should any spilling of fuel occur the Contractor shall immediately recover the contaminated ground and dispose of it offsite in an approved area. Petroleum waste generated shall be stored in marked corrosion-resistant containers and recycled or disposed of in accordance with 40 CFR 279, State, and local regulations.

8. Hazardous Materials and Waste

a. Hazardous wastes are defined in 40 CFR 261. The Contractor shall ensure that hazardous wastes are stored and disposed of in accordance with 40 CFR 261 and State and local regulations. The Contractor shall ensure that hazardous materials are packed, labeled, stored, and transported in accordance with 49 CFR 173 and State and local regulations.

b. Chemical waste shall be stored in corrosion resistant containers, removed from the work area and disposed of in accordance with Federal, State, and local regulations.

9. Disposal of Discarded Materials

a. Discarded materials other than those that can be included in the solid waste category shall be handled as directed by the Department or its Consultant.

C. Preservation and Recovery of Historic, Archeological, and Cultural Resources

1. Applicable Law

a. A number of Federal laws require protection of cultural resources. Two laws, in particular, can be potentially involved with dredging and coastal excavation activities: (1) the National Historic Preservation Act, as amended; and, (2) the Abandoned Shipwreck Act.

2. Known Resources

a. If known historic, archeological and cultural resources within the Contractor’s work area(s) are present, it will be designated as a "potentially significant cultural resource" 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.

3. Inadvertent Discoveries

a. If, during construction activities, the Contractor observes items that may have historic or archeological value, such observations shall be reported immediately to Engineer so that the appropriate authorities may be notified and a determination made as to their significance and 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 his employees from trespassing on, removing, or otherwise damaging such resources.

b. The possibility of encountering submerged cultural resources is inherent in dredging, underwater or nearshore excavation, and snagging operations. Such findings could include shipwrecks, shipwreck debris fields (such as steam engine parts), prehistoric watercraft (such as log "dugouts"), and other structural features intact or displaced. The materials may be deeply buried in sediment, resting in shallow sediments or above them, or protruding into water. Suspected cultural materials inadvertently gathered from a water-saturated context should be kept moist by re-immersion, spraying, or some other expedient means of wetting until the appropriate staff provide further directives. No interviews or other contact with media shall occur without clear authorization from the Department or the appropriate historic preservation representative.

c. The Contractor shall comply with all regulatory conditions related to inadvertent discoveries of potential cultural or historic resources, including the following conditions:

1) General Condition 10 of FDEP Permit No. 0288799-003-JC and 0175572-003-JC

2) General Condition 3 and Special Condition 8 and 9 of DOA Permit No. SAJ-2007-04911

3) General Condition 3 and Special Condition 10 of DOA Permit No. SAJ-2012-00702

4. Claims for Downtime due to Inadvertent Discoveries

a. 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 coordinated with the Department. Contract adjustments resulting from compliance with this paragraph shall be determined in accordance with the Contract Documents.

D. Protection of Water Resources

1. The Contractor shall keep construction activities under surveillance, management, and control to avoid pollution of surface and ground waters. The Contractor shall conduct his operations in a manner to minimize turbidity and erosion, and shall conform to all water quality standards as prescribed by Chapter 63-302 of the Florida Administrative Code. Special management techniques as set out below shall be implemented to control water pollution by the listed construction activities that are included in this contract. The Contractor's construction methods shall protect wetland and surface water areas from damage due to dredging, mechanical grading, erosion, sedimentation and turbid discharges. There shall be no storage or stockpiling of equipment, tools, or materials within wetlands or along the shoreline within the littoral zone unless specifically authorized.

2. Washing and Curing Water

a. Waste waters directly derived from construction activities shall not be allowed to enter surface water areas. These wastewaters shall be collected and placed in retention ponds where suspended materials can be settled out or the water evaporates so that pollutants are separated from the water.

3. Intertidal Areas and Crossings

a. Intertidal areas and crossings shall be controlled and protected from turbidity runoff during construction. Crossings, to allow for upstream discharge, shall provide movement of water without violating water pollution control standards of the Federal, State, and local government.

4. Monitoring of Water Areas

a. Monitoring of water areas affected by construction activities shall be the responsibility of the Contractor. The Contractor shall monitor all water areas affected by construction activities.

5. Turbidity

a. The Contractor shall conduct his operations in a manner to minimize turbidity and shall conform to all water quality standards as prescribed by Chapter 62-302, State of Florida, Department of Environmental Protection (FDEP) and regulatory authorizations.

b. Refer to Section 3.02 TURBIDITY CONTROL and Section 3.03 EROSION AND SEDIMENT CONTROL below for further instructions.

6. Oil, Fuel, and Hazardous Substance Spill Prevention and Mitigation

a. The Contractor shall prevent oil, fuel, or other hazardous substances from entering the air, ground, drainage, local bodies of water, or wetlands. This shall be accomplished by design and procedural controls. The Contractor shall provide containment, diversionary structures, or equipment to prevent discharged oil or other hazardous material from reaching a watercourse. In the event that a spill occurs despite the design and procedural controls, the following shall occur:

1) Immediate action shall be taken to contain and cleanup any spill of oil, fuel oily substances, petroleum products, or other hazardous substance.

2) Spills shall be immediately reported to the Engineer.

3) Spill contingency planning shall be strictly in accordance with the criteria of 40 CFR, Part 109.

4) To control the spread of any potential spill, absorbent materials shall be readily available and capable of absorbing the contents of the single largest tank.

5) To control the spread of any potential spill, the Contractor shall provide a written certification of commitment of manpower, equipment, and materials required to expeditiously cleanup and dispose of spill materials.

b. Petroleum storage tanks shall meet the requirements of these specification and any additional requirements within the Agreement.

c. The Contractor shall provide one or more of the following preventive systems at each oil storage site. The provision of such preventive systems shall be approved by the Engineer prior to tank installation and use.

1) Dikes, berms, retaining walls, culverting, curbing, guttering, or other similar structures shall be capable of containing 110% of the contents of the largest single tank.

2) Spill diversion ponds shall be capable of containing 110% of the contents of the largest single tank.

3) Absorbent materials shall be capable of absorbing 110% of the contents of the largest single tank.

d. Oil Storage Tank Installation: All oil storage tank installation shall be constructed so that a secondary means of containment is provided for the entire contents of the largest single tank. Dikes and other structures shall be positioned or located so as to provide a secondary containment identical to that required for non-mobile storage tanks. Storage tanks shall be located where they will not be subject to flooding or washout. When it is determined that the installation of containment structures or equipment to prevent discharged oil from reaching a watercourse is not practicable, a clear demonstration of such impracticability shall be submitted to the Engineer for approval prior to installation or use of the storage tank. The following shall also be provided to the Engineer for approval prior to installation use of the storage tank.

1) An oil spill contingency plan.

2) A written certification of commitment of manpower, equipment, and materials required to expeditiously control and remove the discharge oil.

e. Pumping of Bilges: Contractors are warned that pumping oil or bilge water containing oil into navigable waters, or into areas which would permit the oil to flow into such waters, is prohibited by Section 13 of the River and Harbor Act of 1899, approved 3 March 1899 (30 Stat. 1152; 33 U.S.C. 407). Violation of this prohibition is subject to penalties provided under the referenced Act.

f. Liabilities: Contractor shall be liable for the damage caused by oil, fuel or hazardous substance spills when it can be shown that the hazardous material was discharged as a result of willful negligence or willful misconduct. The penalty for failure to report such discharges shall be in accordance with state and federal laws.

7. Wetlands Protection

a. The Contractor shall determine the location of wetlands within the project area and adjacent to the project areas from the information contained in the contract documents and site visits. The Contractor shall instruct all personnel associated with the project of the presence of wetlands within 500 feet of staging areas, access roads or any other areas used during construction activities.

b. All construction personnel shall be advised that there are civil and criminal penalties for harming or destroying wetlands beyond actions specifically identified, anticipated, and authorized in these specifications and associated drawings and environmental documents. The Contractor shall erect suitable erosion control barriers along wetland and any other natural areas as necessary. In the event of unforeseen conditions, the Engineer may require the use of control features or methods other than those indicated or proposed by the Contractor.

c. Any adjacent/off-site wetland areas around the perimeter of the site that may be impacted during construction operations shall be protected from construction activities and construction-related runoff through the use of siltation screening and straw bales. The erosion protection devices shall be placed before the initiation of any ground-disturbing activities and shall remain in place until all ground disturbing activities within the project have concluded, and the site has stabilized, at which time the screening or hay bales shall be removed completely from the site.

d. The contractor shall excavate, grade, and/or place dredge spoil within the project area as shown in the construction drawings in such a manner to minimize the potential for any re-entry or re-entrainment back into the inlet or the federal navigation channels of East Pass or Destin Harbor. The Contractor may be held responsible for negligent or willful sedimentation impacts to the navigation channel(s) result of the construction. The Contractor may be required to remove any materials eroded from the project area and deposited within the federal navigation channels, resulting from unprotected erodible soils or improper construction planning, at no cost to the Department.

e. The Contractor shall, at his expense, provide routine maintenance of permanent and temporary erosion control features until the project is completed and accepted. If such erosion control features must be reconstructed due to the Contractor's negligence, carelessness, or in the case of temporary erosion control features, failure by the Contractor to install permanent erosion control features as scheduled, such replacement shall be on the Contractor's expense.

f. If the Contractor through any construction activity degrades, destroys, or impacts the ground cover on any adjoining property including rights-of-way, effected area shall be fully repaired and re-vegetated at the Contractor's expense. Where the area affected is undeveloped with no maintained stand of grass, the area shall be sodded with Bahia or other vegetative cover as approved by the Department and/or its Consultant, and where affected areas are grassed, the sod shall match the applicable vegetative cover.

g. The Contractor shall not anchor, place pipelines, or stage equipment in a manner that will cause any damage to wetlands beyond those specifically identified, anticipated, authorized in these specifications and associated drawings and environmental documents. Anchoring, placing pipeline, or staging equipment shall be avoided in wetland areas. If such activities cannot be done without affecting sensitive areas outside the construction area identified in the contract documents, the activities shall cease, and the Engineer shall be immediately notified. Any actual incident involving damage to, or disturbance of, wetlands shall be reported immediately to the Department's Project Representative.

h. The Contractor shall provide turbidity curtains, siltation fences, hay bales, and other means and materials to prevent the pollution of any offsite streams, intertidal areas and crossings, lakes, ditches, rivers, and other water improvements including on-site retention areas from siltation from erosion, run off, concrete truck wash, mortar mixer cleanout, and other construction activities.

E. Protection of Wildlife Resources

1. The Contractor shall keep construction activities under surveillance, management, and control to minimize interference with, disturbance to, and damage of fish and wildlife. Species that require specific attention along with measures for their protection will be listed in the Contractor's Environmental Protection Plan prior to the beginning of construction operation.

2. In the event that a threatened, endangered, or protected species is harmed because of construction activities, the Contractor shall cease all work and notify the Department's Project Representative and any other parties specified in, and in accordance with, the FDEP and USACE DOA regulatory permits.

F. Endangered Species Protection

1. The Contractor shall instruct all personnel associated with the project of the potential presence of endangered species such as manatees, sea turtles, Gulf sturgeon, and nesting

shorebirds in the area, both on land and in water, and the need to avoid collisions with and harming these animals. All construction personnel shall be advised that there are civil and criminal penalties for harming, harassing, or killing species which are protected under the Marine Mammal Protection Act of 1972, the Endangered Species Act of 1973, and/or the Florida Manatee Sanctuary Act. The Contractor shall be held responsible for any endangered, protected, or threatened species harmed, harassed, or killed as a result of construction activities. The Contractor is not authorized to harm, harass, kill or take any endangered species. The following outlines special operating conditions for endangered species protection:

2. Sea Turtles, Manatees, Smalltooth Sawfish, and Gulf Sturgeon: The Contractor shall follow all endangered species protection measures and conditions in the regulatory authorizations, attached protection measures, and biological opinion documents. All on-site personnel are responsible for familiarizing themselves with these documents and implementing these conditions and measures throughout construction operations.

    a. Civil and Criminal Penalties: All construction personnel shall be advised that there are civil and criminal penalties for harming, harassing, or killing manatees, marine turtles, Gulf Sturgeon, or smalltooth sawfish which are protected under the Marine Mammal Protection Act of 1972, the Endangered Species Act of 1973, and the Florida Manatee Sanctuary Act. The Contractor may be held responsible for any animal harmed, harassed, or killed as a result of construction activities.

    b. Siltation Barriers: If siltation barriers are used, they shall be made of material in which species cannot become entangled, are properly secured, and are regularly monitored to avoid animal entrapment. Barriers must not block species entry to or exit from essential habitat.

    c. Vessel/Boat Operation: All vessels associated with the project shall operate at "Idle Speed/No Wake" speeds at all times while in waters where the draft of the vessel provides less than a four-foot clearance from the bottom, and vessels shall follow routes of deep water whenever possible. Boats used to transport personnel shall be shallow-draft vessels, preferably of the light-displacement category, where navigational safety permits. Mooring bumpers shall be placed on all barges, tugs, and similar large vessels wherever and whenever there is a potential for manatees to be crushed between two moored vessels. The bumpers shall provide a minimum stand-off distance of 4 feet.

    d. Sighting: All on-site project personnel are responsible for observing water-related activities for the presence of manatees, sea turtles, and other endangered species. On-site project personnel shall also actively monitor the beach for potential nesting sea turtles. If an animal is sighted within 100 yards of the project area, all appropriate precautions shall be implemented by the Contractor to ensure protection of the animal. These precautions shall include the operation of all moving equipment no closer than 100 feet of an animal. If a manatee or turtle is closer than 50 feet to moving equipment or the project area, the equipment shall be shut down and all construction activities shall cease within the waterway to ensure protection of the animal. Construction activities shall not resume until the animal has departed the project area. If construction activity shall cease, notify the Engineer. Animals shall not be herded away or harassed into leaving.

    e. Signs: Prior to commencement of construction, each vessel involved in construction activities shall display at the vessel control station or in a prominent location, visible to all employees operating the vessel, a temporary sign at least 8-1/2" x 11" reading, "CAUTION: BOATERS – WATCH FOR MANATEES AND SEA TURTLES." A second sign measuring at least 8 ½" x 11" explaining the requirements for "Idle Speed/No Wake" and the shutdown of in-water operations must be posted in a location

prominently visible to all personnel engaged in water-related activities. In the absence of a vessel, a temporary 3' x 4' sign reading "CAUTION: MANATEE AREA" shall be posted adjacent to the issued construction permit. The Contractor shall remove the signs upon completion of construction. Sample signs can be viewed at www.MyFWC.com/manatee.

f. Sighting Reports: Any collisions with a manatee or turtle or sighting of any injured or incapacitated manatee, turtle, or other endangered species shall be reported immediately to the Department's Project Representative and proper regulatory agencies as required by regulatory authorizations. A copy of the incidental take report shall be provided within 24 hours of the incident. The Contractor shall also immediately report any collision with and/or injury to an endangered species to the Florida Wildlife Conservation Commission "Manatee Hotline" 1-888-404-FWCC (3922), the U.S. Fish and Wildlife Service, Jacksonville Field Station at 904-731-3336, National Marine Fisheries Service's Protected Resource Division at 727-824-5312, FWC at imperiledspecies@myFWC.com, and all other required agencies.

g. Reporting: The Contractor shall maintain a log detailing sightings, collisions, or injuries to manatees, turtles, or other endangered or protected species occurring during the contract period. The data shall be recorded daily on the Contractor's daily reports. All data in original form shall be forwarded weekly to the Engineer within 7 days of collection and copies of the data shall be supplied to the required regulatory agencies, if required.

h. If a sea turtle or Gulf Sturgeon is taken by the dredge (live or dead), the Contractor shall immediately cease operations, notify the Department's Project Representative and email a PDF version of the incidental take report to NOAA-Fisheries Southeast Region at the following email address within 24 hours of the take - takereport.nmfsser@noaa.gov also providing a cc copy to the Department and its Consultant. The Chief, Special Projects and Enforcement Branch will notify the Department and Contractor when to resume dredging.

i. The Contractor's Environmental Protection Plan shall contain the steps to be taken to construct the project in such a manner as not to impact endangered or protected species such as sea turtles, manatees, or the Gulf sturgeon.

3. Protection of Migratory Bird Species

a. The Contractor shall keep construction activities under surveillance, management, and control to prevent impacts to migratory birds and their nests. All construction personnel shall be advised that migratory birds are protected by the Florida Endangered and Threatened Species Act of 1977, Title XXVIII, Chapter 372.072, and the U.S. Fish and Wildlife Service pursuant to the Migratory Bird Treaty Act of 1918 and the Endangered and Threatened Species Act of 1982, as amended. The Contractor may be held responsible for activities which harm or harass the birds, their eggs or their nests as a result of the construction.

b. Monitoring of Construction Area: The Department and/or its Consultant shall conduct monitoring of the construction area beginning February 15 through September 1, or similar time as mandated by FDEP, if construction activities occur during that period. Daily monitoring shall be conducted during the dawn or dusk time frames by a bird monitor approved by the regulatory authorities. The bird monitor(s) shall maintain a daily log detailing monitoring and nesting activity and shall coordinate daily with the Contractor regarding the results of the daily surveys (e.g., lack of nesting activity, nests observed and location, etc.).

c. Nesting Activity Notification: Any nesting activity observed by the bird monitor(s) shall be reported immediately to the Engineer and Contractor, who in consultation with the U.S. Fish and Wildlife Service and the FF&WCC, shall order any work stoppages, creation of required buffer areas, or restart of construction activities.

d. Nesting Within Construction Area: Should nesting begin within the construction area, a temporary, 200-foot buffer shall be created around the nests and marked to avoid entry (the bird monitor will provide signs). The area shall be left undisturbed until nesting is completed or terminated, and the chicks fledge. The decision to allow construction in a former nesting site will be determined by the Engineer in consultation with the U.S. Fish and Wildlife Service and the FF&WCC. Access to the nesting sites by humans (except limited access when accompanied by the bird monitor or Engineer), equipment or pets under control of the Contractor is prohibited.

e. If nesting occurs within the construction area, a bulletin board shall be placed and maintained by the Contractor in the contracting shed with the location map of the construction site showing the bird nesting areas and a warning, clearly visible, stating that "BIRD NESTING AREAS ARE PROTECTED BY THE FLORIDA THREATENED AND ENDANGERED SPECIES ACT AND THE FEDERAL MIGRATORY BIRD TREATY ACT".

f. Birds will find the top of the dike or the flat shoreline areas desirable nesting habitat. If construction activity ceases for any period of time, nesting may occur before work can resume. Any stoppage of activity could induce nesting, subsequently, construction could be altered or stopped to avoid impacting the nesting birds. Areas which are potentially suitable for nesting can be altered to make the area undesirable. One approved method is the placement of stakes at 10- to 15-foot intervals with flagging tied between the stakes in a web fashion. This may dissuade bird nesting until construction can be resumed. In addition, the Contractor shall avoid extended periods of inactivity that could induce nesting.

g. The Contractor's Environmental Protection Plan shall contain the steps to be taken to construct the project in such a manner as not to impact migratory birds or induce their nesting.

h. Work Delay: Delays in work due to the fault or negligence of the Contractor or the Contractor's failure to comply with this specification shall not be compensable. Any adjustments to the contract performance period or price that are required as a result of compliance with this section shall be made in accordance with the Contract Documents.

G. Beach Placement Restrictions

1. Equipment Lighting: Direct lighting of the beach and near shore waters shall be limited to the immediate construction area and shall comply with safety and permit requirements. Lighting on offshore or onshore equipment shall be minimized through reduction, shielding, lowering, and appropriate placement to avoid excessive illumination of the water's surface, beach area, and neighboring properties while meeting all Coast Guard, EM 385-1-1, and OSHA requirements. Light intensity of lighting plants should be reduced to the minimum standard required by OSHA for General Construction areas, in order not to misdirect sea turtles or impact neighboring properties. Shields should be affixed to the light housing and be large enough to block light from all lamps from being transmitted outside the construction area. Refer to Beach Lighting Schematic contained within FDEP Permit No. 0288799-003-JC.

2. Pipeline Placement: Any construction pipes placed parallel to the shoreline shall be placed as far landward as possible without impacting the vegetated dune line.

3. The Contractor shall not store or stockpile tools, equipment, materials, etc. within littoral zones or elsewhere within surface waters of the State without prior written approval from the Department and applicable regulatory agencies. Storage, stockpiling or access of equipment on, in or over or through wetlands or any other resources is prohibited unless it occurs within a work area or ingress/egress corridor that is specifically approved by the Department and regulatory authorizations.

4. The Contractor shall not conduct project operations or store project-related equipment in, on or over dunes, or otherwise impact dune vegetation, outside the approved staging, beach access and dune restoration areas designated in the Project Drawings.

H. Escarpments

1. The Contractor shall perform daily visual surveys for escarpments along finished sections of the nourished beach area that have not been accepted by the Department's Consultant as complete. Escarpments that exceed 18 inches in height for a distance of 100 feet or more shall be mechanically leveled by the Contractor to the natural beach contour or as directed by the Department's Consultant.

I. Submerged Resource Protection

1. The Contractor is not authorized to impact submerged resources including but not limited to, submerged aquatic vegetation (SAV) or seagrasses, hardbottom, natural reefs, or artificial reefs. The Contractor shall be responsible for any delays and costs resulting from failure to comply with this condition and all federal, state and local environmental protection laws and regulations.

2. Existing areas of submerged resources within the Contractor's work area will be so designated on the contract drawings and precaution will be taken to preserve these resources as they existed prior to construction. The Contractor shall install and/or implement all protection measures necessary for these resources and shall be responsible for their preservation and maintenance during this contract.

3. Storage, stockpiling, or access of equipment on, in, over or through beds of submerged aquatic vegetation or other submerged resources is prohibited unless it occurs within a work area or ingress/egress corridor that is specifically approved by this permit. Anchoring or spudding of vessels and barges within beds of aquatic vegetation, hardbottom or other submerged resources is also prohibited.

4. The Consultant performed a pre-dredge SAV survey in October 2015 and this report is included within Appendix B-1. The Appendix includes a copy of the SAV survey report, maps showing the SAV distribution, and the approximate boundaries of the resources and proposed work areas. The Consultant will provide the Contractor with digital files of the SAV survey data (e.g., GPS coordinates or a geo-referenced Auto-CAD file of the SAV boundary) and any future surveys that may occur prior to project construction. The Contractor shall utilize this data to avoid any impacts to this area resulting from project construction. The Contractor is advised that the distribution of seagrasses may change between the time of the previous or future surveys and the time of construction.

5. The Contractor shall implement, at a minimum, the following measures to avoid potential impacts to known submerged resources:

    a. Dredging shall not occur wherever the top of the adjusted channel side slopes (as documented by the pre-construction survey) would come within 15 meters (approx. 50 feet) of seagrass resources.

b. Pipelines shall only be placed in approved areas. The centerline of the proposed pipeline corridor shall remain as close to the dredging area as practical and shall avoid seagrasses and macroalgae by at least 15 meters (approx. 50 feet) on each side.

c. The pipeline shall be continually monitored during dredging activities to avoid impacts due to leaks or ruptures. Any leaks that develop shall be repaired immediately. Dredging and discharge operations shall be shutdown until repairs are completed.

d. Utilizing the results of the most recent submerged resources survey, the Contractor shall keep all construction operations confined to as small an area and as far away as practical from submerged resources.

e. The Contractor shall anchor in sandy areas only at least 15 meters (approx. 50 feet) outside of seagrass beds.

f. The Contractor shall visually inspect (from the vessel) the area prior to anchoring to confirm the absence of seagrass resources.

g. When dredging occurs within 50 meters (approx. 164 feet) of seagrass resources, the Contractor shall record and report the coordinates of all dredge anchor drop points. The anchor drop points shall be recorded using DGPS technology with an accuracy of no less than 2 meters (approx. 6.6 feet). A summary of the anchor drop points shall be provided to the Engineer daily as an attachment to the daily construction report.

6. The Contractor shall report any potential impacts to submerged resources, or violations of these conditions, or those within the regulatory authorizations, to the Department's Project Representative and FDEP (by emailing the Engineer and FDEP JCP Compliance Officer at JCPCompliance@dep.state.fl.us) within 24 hours of the incident.

7. If a leak or rupture is detected within 150 meters (approx. 490 feet) of seagrass resources, the Contractor shall implement corrective actions immediately to minimize impacts to seagrass resources. The Contractor shall survey the area within 21 days of the incident to assess impacts to seagrass resources. The survey shall follow the general survey guidelines within the FDEP authorization and shall be coordinated with the Department, Consultant, FDEP permit processor and FDEP biologist. The Contractor shall provide a summary report to the FDEP within 60 days of completing the survey. The report shall include a summary describing the leak or rupture, survey methods, corrective actions taken to remediate the situation, and the results of the impact assessment. The Contractor will also be required to perform an assessment survey if unauthorized anchoring occurs

J. Protection of Air Resources

1. The Contractor shall keep construction activities under surveillance, management, and control to minimize pollution of air resources. All activities, equipment, processes and work operated or performed by the Contractor in accomplishing the specified construction shall be in strict accordance with the applicable air pollution standards of the State of Florida (Florida Statue, Chapter 403 and others) and all Federal emission and performance laws and standards, including the U.S. Environmental Protection Agency's Ambient Air Quality Standards.

2. Particulates, such as dust, shall be controlled at all times, including weekends, holidays, and hours when work is not in progress. The Contractor shall maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and work areas within or outside the project boundaries free from particulates that would cause air pollution standards to be exceeded or that would cause a hazard or nuisance. The Contractor shall have the necessary equipment and approved methods to control particulates as the work proceeds and before a problem develops.

3. Odors shall be controlled at all times for all construction activities.

K. Protection from Sound Intrusions

1. The Contractor shall keep construction activities under surveillance and control to minimize damage to the environment by noise and to comply with all federal, state, and local noise ordinances. The use of horns, bells or the use of whistle signals shall be held to a minimum necessary in order to ensure as safe and as quiet an operation as possible.

3.02 TURBIDITY CONTROL

A. The Contractor shall keep construction activities under surveillance, management, and control to prevent impacts to water quality resulting from increased turbidity. Special management techniques as set out below shall be implemented to control increased turbidity and water pollution by the listed construction activities which are included in this contract. All construction personnel shall be advised of these specific water quality standards and the requirements of these specifications and regulatory authorizations. The Contractor may be held responsible for negligent or willful impacts to water quality as a result of the construction.

B. The Contractor shall plan his operation and shall conduct his operations in a manner to minimize turbidity and shall conform to all water quality standards as prescribed by Chapter 62-302 of the Florida Administrative Code and FDEP regulatory authorizations. Specifically, the Contractor shall comply with Specific Condition 28 of Permit Number 0288799-003-JC and Specific Condition 13 of Permit Number 0175572-007-JN.

C. Monitoring of Construction Area: The Department or its Consultant shall conduct turbidity monitoring of the dredging and disposal areas during dredging operations in accordance with the FDEP regulatory authorizations. Daily monitoring shall be conducted during daylight hours. The turbidity monitor(s) shall maintain a daily log detailing turbidity monitoring activity and shall coordinate daily with the Contractor regarding the results of the turbidity sampling (e.g., compliant samples, potential exceedances, etc.). The turbidity shall be measured in Nephelometric Turbidity Units (NTU) using a standard Nephelometer or other approved device.

D. Turbidity Compliance Limits: Along the western side of East Pass (within the Outstanding Florida Water [OFW] boundary), the turbidity level at the compliance site shall not exceed 3.0 or 6.2 NTUs above background (depending on the dredge and discharge locations), or 29 NTUs above the corresponding background turbidity levels outside the OFW.

E. Turbidity Exceedances: Should turbidity levels exceed the compliance limits, the turbidity monitor(s) will notify the Contractor and the Contractor shall immediately cease all construction activities related to the exceedance and shall implement corrective measures. Construction activities shall not resume until corrective measures have been taken and turbidity levels have returned to acceptable levels. Corrective measures may include moving the discharge pipeline further landward (away from the shoreline), modifying the work procedures that were responsible for the exceedance, or increasing the length of shore parallel dikes in the vicinity of the discharge to promote settlement of suspended sediment. Turbidity monitors shall continue to monitor turbidity following the exceedance and will notify the Contractor once turbidity has returned to acceptable levels.

F. Turbidity Best Management Practices: When discharging slurried sand onto the beach from a pipeline, the Contractor shall employ best management practices (BMPs) to reduce turbidity. At a minimum, these BMPs shall include the following:

1. Use of shore-parallel sand dikes to promote settlement of suspended sediment on the beach before return water from the dredged discharge reenters open waters; and,

2. Locate the discharge pipeline as far landward as possible to maximize settlement of suspended sediment on the beach before the return water reaches open water.

G. The Contractor's Environmental Protection Plan shall contain the steps to be taken to construct the project in such a manner as not to impact water quality and reduce the potential for increased turbidity.

H. Work Delay: Delays in work due to the fault of negligence of the Contractor or the Contractor's failure to comply with this specification shall not be compensable. Any adjustments to the contract performance period or price that are required as a result of compliance with this section shall be made in accordance with the Contract Documents.

3.03 POST CONSTRUCTION CLEANUP

A. The Contractor shall clean up any area(s) used for construction and return these areas to their pre-construction condition or better.

3.04 PRESERVATION AND RESTORATION OF LANDSCAPE AND SUBMERGED RESOURCES

A. The Contractor shall restore all landscape features and submerged resources damaged or destroyed during construction operations outside the limits of the approved work areas. Such restoration shall be a part of the Environmental Protection Plan as defined in subparagraph "Environmental Protection Plan" of paragraph SUBMITTALS above. This work shall be accomplished at the Contractor's expense.

3.05 DELAYS IN WORK

A. Delays in work due to the fault or negligence of the Contractor or the Contractor’s failure to comply with this specification shall not be compensable. Any adjustments to the contract performance period or price that are required as a result of compliance with this section shall be made in accordance with the provisions of the Agreement.

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SECTION 01 45 16

CONTRACTOR QUALITY CONTROL

PART 1 GENERAL

1.01 SUMMARY

A. This section covers the establishment and operation of the Contractor's Quality Control (CQC) system.

1.02 REFERENCES

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

A. American Society For Testing and Materials (ASTM)

ASTM D 3740	Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
ASTM E 329	Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

1.03 SUBMITTALS

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

A. Quality Control Plan

1. Within twenty (20) calendar days of Notice of Award, the Contractor shall submit the Contractor Quality Control (CQC) Plan for review and acceptance by the Department prior to the pre-construction meeting. The Department will consider an interim plan for the period ending thirty (30) days prior to mobilization to the site. However, the Contractor shall furnish, no later than forty (40) calendar days prior to mobilization to the site, an acceptable final CQC Plan. The plan shall identify personnel, procedures, control, instructions, tests, records, and forms to be used.

2. If the Contractor fails to submit an acceptable CQC Plan within the time prescribed, construction shall not start until an acceptable plan is approved by the Department and Consultant. The Contractor shall not be eligible for any payment of funds under this contract until an acceptable CQC Plan is approved by the Department. If an acceptable final plan is not submitted within the time stated the above paragraph, the Department may order the Contractor to stop work until such time as a plan has been submitted, reviewed and accepted. Any such stop work order shall not be considered a suspension of Work for an unreasonable period of time and the Contractor shall not be entitled to pay adjustments as a result of the stop work order.

3. Failure to comply with the above requirements within the time prescribed will be considered a condition endangering the performance of the Contract and may be considered grounds for termination of the Contract.

B. Registered Surveyor/Mapper's Qualifications

1. Within 10 calendar days after date of receipt of Notice to Proceed, the Contractor shall submit the qualifications of all Registered Surveyor/Mappers for the project in resume format for Department's acceptance.

C. Geotechnical/Construction Materials Testing Company Qualifications

1. Within 10 calendar days after date of receipt of Notice to Proceed, the Contractor shall submit the qualifications of the construction materials testing company(s) for the project in resume format for Department's acceptance.

D. Preparatory and Initial Phase Checklists

1. For each definable feature of work (see SECTION 01 11 00 – SUMMARY OF WORK), the Contractor shall submit the Preparatory and Initial Phase Checklists to the Department a minimum of fifteen (15) calendar days prior to the start of each Phase.

E. Quality Control Logs

1. Submit weekly (or daily if requested by Department) a continuous running log (in Excel Spreadsheet format) of quality control testing and quality control actions taken by Contractor and the results of those tests or actions. Quality control log should document subsequent corrective actions taken for failing tests.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.01 GENERAL

A. The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in accordance with these specifications. The quality control system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the contract documents and requirements. The system shall cover all construction operations, both onsite and offsite, and shall be keyed to the proposed construction sequence. The project superintendent will be held responsible for the quality of work on the job and is subject to removal by the Department for non-compliance with quality requirements specified in the contract. The project superintendent in this context shall mean the individual with the responsibility for the overall management of the project including quality and production.

3.02 QUALITY CONTROL PLAN

A. Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover all construction operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, and purchasing agents:

1. A description of the quality control organization. The staff shall include a CQC System Manager who shall perform his duties in tandem with those of the Project Superintendent and with direct reporting responsibility to an officer of the prime Contractor and/or an individual not directly responsible for production. The Project Manager/Superintendent may have dual roles as CQC System Manager or Safety Officer, but may not fulfill all three duties. Additionally, a qualified Florida Licensed Professional Land Surveyor is required for all surveys.

2. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.

3. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures shall establish verification that identified deficiencies have been corrected.

4. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with SECTION 01 33 00 Submittal Procedures.

5. A list of the definable features of work. A definable feature of work is a task that is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable feature under a particular section. This list will be agreed upon during the Coordination Meeting.

6. Reporting procedures, including proposed reporting formats.

7. A sample of the proposed Quality Control Log.

B. Acceptance of CQC Plan

1. Acceptance of the Contractor's CQC plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Department reserves the right to require the Contractor to make changes to his CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

C. Failure to Submit Acceptable CQC Plan

1. If the Contractor fails to submit an acceptable CQC plan within the time prescribed, construction SHALL NOT start unless an acceptable interim plan is submitted. If an acceptable final plan is not submitted within a reasonable time, as determined by the Department, the Department may order the Contractor to stop work until such time as an acceptable plan has been submitted. Any such stop work order shall not be considered a suspension of work and the Contractor shall not be entitled to pay adjustments as a result of the stop work order. Failure to comply with the above requirements within the time prescribed will be considered a condition endangering the performance of the Contract and may be considered grounds for termination of the Contract.

D. Notification of Changes

1. After acceptance of the CQC Plan, the Contractor shall notify the Department in writing a minimum of seven (7) calendar days prior to any proposed change. Proposed changes are subject to acceptance by the Department.

3.03 COORDINATION MEETING

A. As part of the review and acceptance by the Department of the CQC Plan, the Contractor shall meet with the Department's Project Manager and its Consultant at a mutually agreed time and location to discuss the Contractor's quality control system and any questions that may have resulted from the initial review. During the meeting, a mutual understanding of the system details will be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with Owner's Quality Assurance. There may also be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

3.04 QUALITY CONTROL ORGANIZATION

A. General

1. The requirements for the CQC organization are a CQC System Manager and sufficient number of additional qualified personnel to ensure contract compliance. The Contractor shall provide a CQC organization which shall be at the site at all times during progress of the work and with complete authority to take any action necessary to ensure compliance with the contract. All CQC staff members shall be subject to acceptance by the Department. The organization shall designate a Safety Officer who will serve as a member of the CQC staff and designate a qualified surveyor for quantity measurement.

B. CQC System Manager

1. The Contractor shall identify as CQC System Manager an individual within the onsite work organization who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System Manager shall be a construction person with a minimum of eight (8) years of experience in related work. This CQC System Manager shall be on the site at all times during construction and shall be employed by the prime Contractor. The CQC System Manager shall be assigned as System Manager but may have duties as project superintendent in addition to quality control. An alternate for the CQC System Manager, containing a minimum of three (3) years of experience, shall be identified in the plan to serve in the event of the System Manager's absence.

C. CQC Personnel

1. A staff shall be maintained under the direction of the CQC System Manager to perform all CQC activities. The staff must be of sufficient size to ensure adequate CQC coverage of all work phases, work shifts, and work crews involved in the construction. These personnel may perform other duties, but must be fully qualified by experience and technical training to perform their assigned CQC responsibilities and must be allowed sufficient time to carry out these responsibilities. The CQC plan will clearly state the duties and responsibilities of each staff member.

D. Registered Professional Surveyor/Mapper

1. A licensed Professional Surveyor/Mapper registered in the State of Florida shall perform all layouts of the work and quantity surveys required to carry out the project work. The Professional Surveyor/Mapper shall certify all drawings, computations, and all other records relating to surveys or layouts of the work.

2. The Registered Professional Surveyor/Mapper must have appropriate equipment (e.g., heave, pitch, and roll compensator) to be able to work within inclement weather conditions.

E. Geotechnical Construction Testing Company

1. Construction testing shall be performed by personnel working under the supervision of a Registered Professional Geotechnical Engineer or Geologist.

F. Organizational Changes

1. The Contractor shall maintain the CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff, the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the Department for acceptance.

3.05 CONTROL

A. The Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control shall be conducted by the CQC System Manager for each definable feature of work as follows:

1. Preparatory Phase

This phase shall be performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase shall include, but not be limited to:

a. A review of each paragraph of applicable specifications.

b. A review of the Project Drawings

c. A check to assure that all materials and/or equipment have been tested, submitted, and approved.

d. Review of provisions that have been made to provide required control inspection and testing.

e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.

f. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.

g. Reviews of the appropriate activity hazard analysis to assure safety requirements are met.

h. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for the feature of work.

i. A check to ensure that the portion of the plan for the work to be performed has been accepted by the Engineer.

j. Review requirements under permits, environmental protection, and protection of environmental species.

k. Discussion of the initial control phase (workmanship).

l. The Department and its Consultant shall be notified at least 24 hours in advance of beginning the preparatory control phase. This phase shall include a meeting conducted by the CQC System Manager and attended by superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. The results of the preparatory phase actions shall be documented by separate minutes, worksheets or checklists prepared by the CQC Systems Manager and attached to the daily CQC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

2. Initial Phase

This phase shall be accomplished at the beginning of a definable feature of work. The following shall be accomplished:

a. A check of work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.

b. Verify adequacy of turbidity monitoring and survey controls to ensure full contract compliance. Verify required control inspection and testing.

c. Establish a level of workmanship and verify that it meets minimum acceptable workmanship standards and review allowable tolerances. Compare with required sample panels as appropriate.

d. Resolve all differences.

e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.

f. The Department and its Consultant shall be notified at least 24 hours in advance of beginning the initial phase. Separate minutes or other documents of this phase shall be prepared by the CQC Systems Manager and attached to the daily CQC report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases; and

g. The initial phase should be repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

3. Follow-up Phase

Daily checks shall be performed to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Final follow-up checks shall be conducted and all deficiencies corrected prior to the start of additional features of work which may be affected by the deficient work. The Contractor shall not build upon nor conceal non-conforming work.

4. Additional Preparatory and Initial Phases

Additional preparatory and initial phases shall be conducted on the same definable features of work if the quality of on-going work is unacceptable; there are changes in the applicable CQC staff, onsite production supervision or work crew; work on the definable feature is resumed after a substantial period of inactivity; when other problems develop.

3.06 TESTS

A. Testing Procedure

1. The Contractor shall perform specified tests to verify that control measures are adequate to provide an end product which conforms to contract requirements. Upon request, the Contractor shall furnish to the Department's Consultant duplicate samples of test specimens for possible testing by the Department or its Consultant. Testing includes operations and/or acceptance tests when specified. The Contractor shall procure the services of a Department-approved testing laboratory or establish an approved testing laboratory at the project site. The Contractor shall perform the following activities and record and provide the following data:

    a. Verify that testing standard or procedures comply with contract requirements

    b. Verify that facilities and testing equipment are available and comply with testing standards.

    c. Check test instruments calibration data against certified standards

    d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.

    e. Results of tests and monitoring instruments, both passing and failing, shall be recorded on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test shall be given. If approved by the Department and/or its Consultant, actual test reports may be submitted later with a reference to the test number and date taken. An information copy of test performed by an offsite or commercial test facility shall be provided directly to the Department and its Consultant. Failure to submit timely test reports as stated or maintain adequate monitoring testing may result in nonpayment for related work performed and disapproval of the test facility for this contract.

3.07 TESTING LABORATORIES

A. Capability Check

1. The Department reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel shall meet criteria detailed in ASTM D3740 and ASTM E329 or shall be FDOT certified.

B. Capability Recheck

1. If the selected laboratory fails the capability check, the Contractor will be assessed a charge to reimburse the Department for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the contract amount due the Contractor.

C. Onsite Laboratory

1. The Department reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests and to check Contractor's testing procedures, techniques, and test results at no additional cost to the Owner.

D. Furnishing or Transportation of Samples for Testing

1. Costs incidental to the transportation of samples or materials shall be borne by the Contractor. Samples of materials for test verification and acceptance testing by the Department shall be delivered to Department-approved laboratory. Coordination for each specific test, exact delivery location, and dates will be made with the Department and its Consultant.

3.08 COMPLETION INSPECTION

A. See SECTION 01 77 00 PROJECT CLOSEOUT for Completion Inspection requirements.

3.09 DOCUMENTATION AND REPORTS

A. The Contractor shall maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the following information:

1. Contractor or subcontractor or testing agency performing quality control work.

2. Description of quality control test or work performed that day.

3. If lab testing is required, submit documentation that lab tests are forthcoming. Once lab tests are available, append lab results to that day's quality control work.

4. List deficiencies noted along with corrective action.

5. Instructions given/received and any conflicts in Drawings and/or Specifications.

6. Contractor's verification statement.

B. Submit weekly (or daily if requested by Department) a continuous running log (in Excel Spreadsheet format) of quality control testing and quality control actions taken by Contractor and the results of those tests or actions. Quality control log should document subsequent corrective actions taken for failing tests.

3.10 NOTIFICATION OF NONCOMPLIANCE

A. The Department or its Consultant will notify the contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Department may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

--END OF SECTION--

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SUMMARY

A. In addition to temporary construction facilities, this section covers site security, temporary utilities, vehicular access and parking, and project identification. The Contractor is responsible for adherence to and reporting requirements for all applicable permit conditions.

B. See SECTION 01 35 43 ENVIRONMENTAL PROTECTION for requirements including silt control, trailer placement, fueling restrictions, dust control, solid waste, and clean-up. Upon completion of project, clean-up and restore area in accordance with SECTION 01 77 00 – PROJECT CLOSEOUT.

C. Construction facilities include, but are not limited to, the following:

a. Contractor's Field Offices

b. Information Bulletin Board

c. Material and Equipment Storage Area

d. Fueling Area

e. Secured Storage Area

f. Employee Parking Area

g. Debris Container (Dumpster)

h. Construction Signage to include Project Sign; Safety Sign; and Construction Warning Signs

D. Temporary utilities include, but are not limited to, the following:

a. Water

b. Electric

c. Sewage

d. Communications

e. Lighting

PART 2 REFERENCES

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

A. American National Standards Institute (ANSI)

ANSI C2	(1997) National Electrical Safety Code

B. National Fire Protection Association (NFPA)

NFPA 70	(1999) National Electrical Code

C. U.S. Army Corps of Engineers (USACE)

USACE CESAJR 385-1-1	(1998) Safety and Occupational Health Program
USACE EM 385-1-1	(2003) U.S. Army Corps of Engineers Safety and Health Requirements Manual

2.02 SUBMITTALS

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

A. Mobilization/Demobilization Plan

1. Prior to construction, the Contractor shall submit a Mobilization/Demobilization Plan. This plan shall be submitted within 20 calendar days of Notice of Award. The Contractor may prepare a single Plan covering the separate mobilization and demobilization activities. The Mobilization/Demobilization Plan shall include, but not be limited to, the following:

   a. Mobilization Requirements:

      1) Methods, equipment and materials;

      2) Connection of utilities;

      3) Site Access;

      4) Placement of site facilities and temporary controls; and

      5) Construction of facilities

   b. Demobilization Requirements (methods, equipment, and materials required to clean-up and restore site at project conclusion):

      1) Collection, recycle and disposal of solid waste

      2) Contract-generated material

      3) Utility disconnection

      4) Removal of Contractor facilities

5) Repair and restoration of site (i.e., fences, roads, or permanent facilities)

B. Security Plan

1. At or before the scheduled pre-construction conference, the Contractor shall prepare a Security Plan for the Engineer describing site security as follows:

a. Day and night security

b. Weekend and holiday security

c. General security duties (including disposal area security)

C. Hurricane and Severe Storm Plan

1. The Contractor shall prepare a Hurricane and Severe Storm Plan for the Engineer describing the following:

a. A description of the contractor's chain of command for implementing the Hurricane and Severe Storm Plan;

b. Types of storms anticipated (winter storm, hurricane, tornado, etc.);

c. Time intervals before storms when action will be taken, details of the actions taken, and estimates of time until construction operations may commence;

d. List of equipment to be used on the job and its ability to handle adverse weather;

e. List of safe harbors and the distances from the work area to these harbors and the time and equipment required to move the equipment to these harbors. Copies of letters of approval for the use of these safe harbors (local authorities, U.S. Coast Guard, etc.) where applicable;

f. Methods for securing construction equipment (within safe harbor or on-site), temporary facilities, construction materials, and constructed items;

g. Plan of evacuation to include interim measures, i.e., immediate reaction plans to be taken for all storm occurrences, particularly sudden/flash storms; and

h. A description of the contractor's insurance coverage for damage due to severe weather

D. Temporary Facility Shop Drawings

1. Within 10 calendar days after date of receipt of Notice to Proceed, the Contractor shall submit a general layout sketch of the Contractor's temporary site facilities which shall include, but not be limited to, the following:

a. Traffic control plan (with adjacent landowner at site access point)

b. Parking areas

c. Material storage

d. Equipment lay down area

e. Fuel areas

f. Supplemental or other staging areas

g. Temporary well, water supply

h. Septic field or holding tanks, port-a-lets

i. Fences -- location and dimensions, entrance and exit points, and details of installation

j. Project sign

2.03 EXISTING AND TEMPORARY UTILITIES (REFER TO GENERAL CONDITIONS B-27 UTILITY CONNECTIONS)

PART 3 PRODUCTS

3.01 STORAGE CONTAINERS

A. Provide welded steel construction, locking, shipping containers or equal.

B. Fuel sled - ensure double containment for fuel tank, and electrically grounded and have fire extinguisher station.

3.02 FIELD OFFICE (REFER TO SECTION F SAMPLE CONTRACT PARAGRAPH 4.16.12 CONTRACTOR'S FIELD OFFICE)

PART 4 EXECUTION

4.01 GENERAL REQUIREMENTS

A. Identification of Employees

1. Contractor and Subcontractor personnel shall wear identifying markings on hard hats, safety vests, and shirts clearly identifying the company for whom the employee works.

B. Employee Parking (Refer to Section F Sample Agreement Paragraph 4.16.07 Parking)

C. Onsite Information

1. Keep copy of Project Drawings, specifications, and other contract documents at Contractor's Field Office, available for use at all times.

4.02 AVAILABILITY AND USE OF UTILITY SERVICES

A. Install temporary facilities and utilities in accordance with ANSI C2, USACE CESAJR 385-1-1, USACE EM 385-1-1, and NFPA 70. Obtain necessary construction, building, zoning, or soil erosion and sediment control approvals required by local authorities, and utility companies.

Equip trailer(s) with wind tie downs in accordance with local wind and building code requirements.

B. Fire Extinguisher

1. Refer to USACE EM 385-1-1. Non-toxic, dry chemical, fire extinguisher meeting Underwriters Laboratories, Inc., approval for Class A, Class B, and Class C fires with a minimum rating of 2A; 10B; and 10C.

C. Utility Lines

1. Install, connect, and modify temporary lines (if required) as coordinated with the Engineer and with local utility approval. Conform to requirements in accordance with ANSI C2 and NFPA 70 for Temporary Electric Lines.

2. Remove all temporary utilities at completion of project and restore the areas where temporary utilities existed to the pre-construction condition or better.

4.03 PROJECT INFORMATION SIGNS (REFER TO SECTION F SAMPLE AGREEMENT PARAGRAPH 4.16.10 PROJECT BOARD AND SIGNS)

4.04 PROTECTION AND MAINTENANCE OF TRAFFIC

A. During construction, the Contractor shall provide access and temporary roads, as necessary, to maintain traffic. The Contractor shall maintain and protect traffic on all affected roads during the construction period. Measures for the protection and diversion of traffic, including the provision of watchmen and flagmen, erection of barricades, placing of lights around and in front of equipment and the work, and the erection and maintenance of adequate warning, danger, and direction signs, shall be as required by the State and local authorities having jurisdiction. The traveling public shall be protected from damage to person and property. The Contractor's traffic, on roads selected for hauling material to and from the site, shall interfere as little as possible with the adjacent landowner(s). The Contractor shall investigate the adequacy of existing roads and the allowable load limit on these roads. The Contractor shall be responsible for the repair of any damage to roads caused by construction operations.

B. Barricades

1. The Contractor shall erect and maintain temporary barricades to limit public access to hazardous areas. Such barricades shall be required whenever safe public access to paved areas such as roads, parking areas or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic. Barricades shall be securely placed, clearly visible with adequate illumination to provide sufficient visual warning of the hazard during both day and night.

4.05 CONTRACTOR'S TEMPORARY FACILITIES

A. Waste Storage

1. Provide dumpsters or suitable debris containers. Prevent wind-blown trash; cover as needed. Dispose of offsite when needed. Refer to SECTION 01 35 43 ENVIRONMENTAL PROTECTION.

B. Fuel Storage and Fueling Operations

1. Refer to SECTION 01 35 43 ENVIRONMENTAL PROTECTION. Provide light when fueling at night.

4.06 SITE SECURITY (ALSO REFER TO SECTION F SAMPLE CONTRACT PARAGRAPH 4.16.13 SITE SECURITY)

A. Secure the project site at all times both during and after working hours as described below.

1. During working hours, limit vehicular access to authorized vehicles and personnel only.

2. During working hours, maintain a sign-in log documenting visitors, deliveries, and security incidents.

3. Check fenced areas, equipment, trailers on a daily basis. If damage is observed or vandalism is found report to the Engineer.

4. On non-workdays, secure site perimeter with measures sufficient to ensure no unauthorized access into work areas.

5. No visitors will be allowed on site without knowledge of Contractor and permission of the Owner. Direct visitors to report upon arrival to Contractor's Field Office for site safety and accident prevention briefing. Provide visitors appropriate protective equipment (i.e., earplugs, safety glasses, etc.).

4.07 TEMPORARY PROJECT SAFETY FENCING

A. As soon as practicable, but not later than 15 days after the date established for commencement of work, the Contractor will furnish and erect temporary project safety fencing at the work site. The safety fencing will be a high visibility orange colored, high density polyethylene grid or approved equal, a minimum of 42 inches high, supported and tightly secured to steel posts located on maximum 10 foot centers, constructed at the approved location(s). The safety fencing will be maintained by the Contractor during the life of the contract and upon completion and acceptance of the work, will become the property of the Contractor, and then will be removed from the work site.

4.08 CONTRACTOR-FURNISHED BOAT AND MARINE RADIOS FOR OWNER PERSONNEL

A. The Contractor shall furnish crew boat transportation and marine radios as needed. The boat shall be properly outfitted to meet all safety requirements of the U.S. Coast Guard. The Contractor shall also provide an operator who possesses an appropriate U.S. Coast Guard operator’s license for carrying passengers on board.

4.09 PLANT COMMUNICATION

A. Whenever the Contractor has the individual elements of its plant so located that operation by normal voice between these elements is not satisfactory, the Contractor shall install a satisfactory means of communication, such as telephone or other suitable devices. The devices shall be made available for use by the Department and its Consultant’s personnel.

4.10 CLEANUP

A. Construction debris, waste materials, packaging material, and the like shall be removed from the work site daily. Any dirt or mud that is tracked onto paved or surfaced roadways shall be cleaned away. Materials resulting from demolition activities that are salvageable shall be stored within the fenced area described above or at the supplemental storage area. Stored material not in trailers, whether new or salvaged, shall be neatly stacked when stored. Refer to Section 01 35 43 ENVIRONMENTAL PROTECTION for solid waste and post construction clean-up.

4.11 RESTORATION OF STAGING AND STORAGE AREA

A. Upon completion of the project and after removal of trailers, materials, and equipment from within the fenced area, the fence shall be removed and will become the property of the Contractor. Areas used by the Contractor for the storage of equipment or material, or other use, shall be restored to the original or better condition. Gravel used to traverse grassed areas shall be removed as required and the area restored to its original condition, including topsoil and seeding as necessary.

-End of Section-

SECTION 01 77 00

PROJECT CLOSEOUT

PART 1 GENERAL

1.01 SUMMARY

A. This section includes administrative and procedural requirements for contract closeout including, but not limited, the following:

1. Preliminary and inspection substantial completion procedures

2. Preliminary and re-inspection closeout completion procedures

3. Record Document submittal

4. Inspection procedure

5. Final cleaning and site restoration

B. Closeout requirements for specific construction activities are included in the appropriate sections of this specification.

1.02 SUBMITTALS

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

A. Record Drawings (Refer to General Conditions Article 37 Record Drawings)

B. Request for Inspection (Refer to General Conditions Article 33 Substantial Completion and Punch List)

1. The Contractor shall notify the Engineer in writing when ready for the substantial completion inspection and the final acceptance inspection. The Owner and Engineer will then set up an appropriate time for inspection.

1.03 PROJECT RECORD DOCUMENTS

A. Record Drawings (Also Refer to General Conditions Article 37 Record Drawings)

1. Throughout the project, maintain at least one clean, undamaged full-size hard copy set of Project Drawings for submittal as Record Drawings for Engineer review. Do not use Record Drawings for construction purposes.

2. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the Work.

3. Where Shop Drawings are used, record a cross-reference of the Shop Drawings submittal number at the corresponding location on the Record Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

4. Mark new information that is important to the Engineer and Owner but was not shown on the Project Drawings or Shop Drawings.

5. Note related Change-Order numbers where applicable.

6. All changes due to field Request for Information (RFI) process, shop drawings reflecting modified data due to submittal and approval process, and contract field and design modifications shall be incorporated in the Record Drawings.

7. Record Drawings shall be kept current on a weekly basis and at least one set shall be available on the jobsite at all times. Changes from the contract plans that are made in the work or additional information which might be uncovered in the course of construction shall be accurately and neatly recorded as they occur by means of details and notes.

8. The Engineer and the Contractor will jointly review the Record Drawings for accuracy and completeness prior to submission of each monthly pay estimate.

9. The Owner and Engineer reserves the right to reject any drawing files it deems incompatible with the Engineer's AutoCAD system. Paper prints, drawing files and storage media submitted will become the property of the Owner upon final approval. Failure to submit final As-Built Drawing files and marked prints as specified shall be cause for withholding any payment due the Contractor under this contract.

B. Final Record Drawings (Specifics):

Within fifteen (15) days of completion of the Project, the Contractor shall complete an as-built survey and submit an As-Built Drawing set including all constructed elements of the Project (rock and sheetpile wall structures, dredging, upland grading, etc.) and other construction items as deemed necessary by the Department. The as-built survey shall show plan location and elevations of all constructed features..

The The Final Record Drawing set shall display the constructed rock and sheetpile wall structure cross sections as well as the dredging cross sections superimposed on the Project Drawing sheets displaying these planned cross sections. Linework for the constructed features should be bold and easily distinguishable from linework for the designed features. Linework for the designed features shown in the Project Drawings shall be made to plot faded and in the background of the constructed features. Where the specifications list required tolerances, the As-Built Drawings shall clearly indicate if the constructed item is out of tolerance.

The Final Record Drawing set shall display as-built elevations and contours of the completed upland grading overlaid atop the proposed grading shown on the Project Drawings for comparison. The Final Record Drawing shall also clearly display the locations and elevations of all upland sheet pile walls and cap elevations (buried or exposed).

For unit price bid items determined by survey, the As-Built Survey Drawing set shall show a table with the final construction quantities of each unit price item using the same unit as indicated on the Bid Schedule.

1.04 SUBSTANTIAL COMPLETION (REFER TO GENERAL CONDITIONS ARTICLE 33 SUBSTANTIAL COMPLETION AND PUNCH LIST)

A. The Contractor shall notify the Engineer and Owner in writing when it considers the Work to be Substantially Complete. The Contractor shall follow the procedures required by the Contract Documents.

1.05 FINAL ACCEPTANCE (REFER TO GENERAL CONDITIONS ARTICLE 38 FINAL PAYMENT AND FORMS REQUIRED)

A. The Owner will consider the project complete upon completion of the following:

1. All punchlist items

2. Submittal and acceptance of all construction records and documentation

B. Before requesting inspection for Certification of Final Acceptance, complete the following:

1. Submit all outstanding submittals.

2. Submit final pay application reflecting all changes in the contract price.

3. Submit final release of liens

C. Inspection Procedures

1. Preliminary Procedures: When requesting final inspection, include exceptions in the request. Before requesting final inspection of the Work for certification of final acceptance and final payment, complete the following:

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

b. Submit an updated final statement, accounting for final additional changes to the Contract Sum.

c. Submit a certified copy of the Engineer's final inspection list of items to be completed or corrected, endorsed and dated by the Engineer. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance and shall be endorsed and dated by the Engineer.

d. Submit Consent of Surety to final payment.

e. Submit a final liquidated damages settlement statement.

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

2. Re-inspection Procedure: The Department and/or its Consultant will re-inspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances acceptable to the Department and/or its Consultant.

a. Upon completion of re-inspection, the Consultant will prepare a certificate of final acceptance. If the Work is incomplete, the Consultant will advise the Contractor of

Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.

b. If necessary, re-inspection will be repeated.

PART 2 PRODUCTS

2.01 AUTOCAD DRAWINGS

A. The Contractor will be furnished AutoCAD design files. The Contractor shall use the electronic design files provided by the Department's Consultant to prepare changes and additions to the electronic As-Built Drawings.

PART 3 EXECUTION

3.01 COMPLETION INSPECTION

A. Punch-Out Inspection

1. Near the completion of all work or any increment thereof, the CQC System Manager shall conduct an inspection of the work and develop a "punch list" of items which do not conform to the approved drawings and specifications. Such a list of deficiencies shall be included in the CQC documentation and shall include the estimated date by which the deficiencies will be corrected. The CQC System Manager or staff shall make a second inspection to ascertain that all deficiencies have been correct. Once this is accomplished, the Contractor shall notify the Department that the facility is ready for "Pre-Final" inspection.

B. Substantial Completion Inspection

1. The Department and/or its Consultant may perform a Pre-Final Inspection to verify that the Work is complete. The Contractor shall provide transportation as necessary to the Department and Consultant Personnel to inspect any component of Work that is readily accessible. The Contractor's CQC System Manager shall ensure that all items identified as needing completion or corrections have been addressed before requesting a final inspection. Any items noted on the Pre-Final Inspection shall be corrected in a timely manner. These inspections and any deficiency corrections required by this paragraph shall be accomplished within the time slated for completion of the entire work or any particular increment thereof if the project is divided into increments by separate completion dates.

C. Final Completion Inspection

1. The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, Department's Project Manager and Consultant shall attend this inspection. Additional Owner Representatives may also be in attendance. The final acceptance inspection will be formally scheduled by the Department's Project Manager based upon results of the Pre-Final inspection. Notice shall be given to the Department at least seven (7) days prior to the final acceptance inspection and shall include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of Contractor to have all contract work acceptably complete for this inspection will be cause for the Department to bill the Contractor for the additional inspection cost. In addition to the Owner, other agencies may attend.

3.02 FINAL SITE CLEANUP (REFER TO GENERAL CONDITIONS ARTICLE 34 CLEANING)

-- END OF SECTION --

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SUMMARY

A. The Work specified in this section includes furnishing all labor, equipment and materials required for the cast-in-place concrete caps on sheet pile wall and all ancillary concrete items. This Work shall be accomplished in complete and strict accordance with the Specifications and the applicable Project Drawings and shall be subject to the terms and conditions of the Contract.

1.02 GENERAL

A. The Contractor is responsible for the mix design and shall proportion the concrete mix for specific project requirements such as travel time, workability, curing methods, pumpability, weather conditions, expected field strength, etc. The Contractor shall notify the Engineer in writing if any of the concrete requirements herein inhibit or prevent the satisfactory installation or strength requirements of the concrete.

B. All concrete work shall comply with ACI 318 Building Code Requirements for Structural Concrete.

C. Concrete work shall comply with ACI 301 Specifications for Structural Concrete including the following, except as modified herein and in the contract documents.

1. General requirements including quality assurance, acceptance of structure, and protection of in-place concrete.

2. Formwork and form accessories.

3. Steel reinforcement and supports.

4. Concrete mixtures.

1.03 REFERENCES

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

A. American Concrete Institute (ACI)

ACI 117	Specifications for Tolerances for Concrete Construction and Materials & Commentary
ACI 301	Specifications for Structural Concrete
ACI 305R	Hot Weather Concreting
ACI 304.2R	Placing Concrete by Pumping Methods
ACI 304R	Guide for Measuring, Mixing, Transporting, and Placing Concrete
ACI 306.1	Standard Specifications for Cold Weather Concreting
ACI 308.1	Standard Specifications for Curing Concrete
ACI 309R	Guide for Consolidation of Concrete
ACI 318	Building Code Requirements for Structural Concrete and Commentary

ACI 347R	Guide to Formwork for Concrete

B. American Society for Testing and Materials (ASTM)

ASTM A615	Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM C31	Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C33	Standard Specification for Concrete Aggregates
ASTM C39	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C94	Standard Specification for Ready-Mixed Concrete
ASTM C143	Standard Test Method for Slump of Hydraulic Cement Concrete
ASTM C150	Standard Specification for Portland Cement
ASTM C173	Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
ASTM C231	Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C260	Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C309	Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C494	Standard Specification for Chemical Admixtures for Concrete
ASTM C618	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete
ASTM C989	Standard Specification for Slag Cement for Use in Concrete and Mortars
ASTM C1064	Standard Test Method for Temperature of Freshly Mixed Portland Cement Concrete
ASTM C1240	Standard Specification for Silica Fume Used in Cementitious Mixtures

1.04 DEFINITIONS

1. Cementitious Material: As used herein shall include portland cement, pozzolan, fly ash, ground granulated blast-furnace slag, and silica fume.

2. Engineer: The Engineer as designated by the owner in charge of construction oversight.

3. Engineer of Record: The Engineer whose signature and seal is affixed to the Drawings and Specifications.

4. Pozzolan: A silicious or aluminous material, which in itself possesses little or no cementitious value but will, in finely divided form and in the presence of moisture, chemically react with calcium hydroxide at ordinary temperatures to form compounds possessing cementitious properties.

5. Compressive Strength: Compressive strength of concrete at 28 days per ASTM C39 using standard cylinders.

1.05 PRECONSTRUCTION SUBMITTALS

The Contractor shall provide the following submittals for Engineer approval at least 14 days (unless otherwise noted) prior to ordering materials or casting concrete:

A. Cast-in-Place Concrete Mixture Design

1. Submit a detailed design of all concrete mixtures showing the amounts and types of cement, water, fly ash, pozzolans, corrosion inhibitor, slag, aggregates, admixtures, and other components of the mix for each mix required.

B. Concrete Mix Materials

Submit manufacturer's information or test reports demonstrating that materials meet referenced ASTM specifications and that the mix design will be suitable for the job conditions. Submittals shall include the following where applicable:

1. Fly Ash: Submit manufacturer's data or certification demonstrating that fly ash and pozzolans comply with ASTM C618 type F.

2. Silica Fume: Submit manufacturer's data or certification demonstrating that silica fume complies with ASTM C1240.

3. Blast Furnace Slag: Submit manufacturer's data or certification demonstrating that blast furnace slag complies with ASTM C989.

4. Aggregates: Submit manufacturer's data or certification that aggregates comply with ASTM C33.

5. Admixtures, Air-Entraining Agents, and Corrosion Inhibitors: Submit manufacturer's data or certification that concrete admixtures comply with ASTM C494 and that the air-entraining agents comply with ASTM C260. Submit manufacturer's literature and test reports for corrosion inhibitors and anti-washout admixtures.

6. Cement: Submit manufacturer's data or certification that Portland cement complies with ASTM C150.

C. Concrete Curing Materials and Methods

1. Submit proposed materials and methods for curing concrete member types including the water source. If silica fume is required in the mix design, specify the methods that will be used to ensure proper curing and prevent plastic shrinkage cracking. Also describe how finishing methods will be adjusted or modified for silica fume concrete. If a curing compound will be used, submit manufacturer's information for approval.

D. Steel Reinforcement and Shop Drawings

1. Submit manufacturer's certification and mill test reports that reinforcement meets ASTM A615 Grade 60 requirements. Provide reinforcement shop drawings showing bending details, lap lengths, bar sizes, and other details of reinforcement placement.

E. Ancillary Materials

1. Submit manufacturer's information on joint material, joint sealant, backer rods, bearing pads, shims, mechanical connections, form ties, chairs, spacers, sealers, epoxy anchors, epoxy adhesive for dowels, grout, patching material, crack repair material, and other items used for concrete and installation of concrete.

1.06 CONCRETE CONSTRUCTION SUBMITTALS

A. Concrete Testing Reports

Sample and test the fresh concrete for slump, temperature, air content, and compressive strength. Collect samples of fresh concrete to perform tests specified in accordance with ASTM C31 for making test specimens. Sample and test concrete a minimum of once each day and at least once every 20 cubic yards thereafter. Sample and test any concrete where field or plant personnel add more than 2 gallons of water or add water in excess of the allowable water quantity shown on the batch ticket. The following testing results shall be submitted within 3 business days of test results:

1. Delivery Certification: The Contractor shall ensure that an electronic delivery ticket is furnished with each batch (truckload) of concrete before unloading. The delivery ticket shall include the mix number.

2. Slump Test Results: Perform slump tests in accordance with ASTM C143.

3. Temperature Test Results: Perform temperature tests in accordance with ASTM C1064. The temperature of concrete at time of placement shall not exceed 95 degrees F.

4. Air Entrainment Test Results: Test Concrete for air content in accordance with ASTM C231 or ASTM C173.

5. Compressive Strength Test Results: Sample and conduct strength tests in accordance with ASTM C39.

B. Notice of Ready for Inspection

Submit notice to the Engineer at least 48 hours in advance of concrete placement that formwork and reinforcement is ready for inspection.

PART 2 PRODUCTS

2.01 CONCRETE MIX

A. Cement: Cement shall comply with ASTM C150, Type II

B. Fly Ash: Fly Ash shall be a by-product produced from the combustion of coal or powdered coal (not petroleum coke) and shall comply with ASTM C618, Type F.

C. Slag: Slag material shall comply with ASTM C989, Grade 120.

D. Silica Fume: Silica fume material shall comply with ASTM C1240.

E. Water: Water shall comply with the requirements of ASTM C94.

F. Aggregates: Material shall comply with ASTM C33

G. General Admixtures: Air entraining admixtures shall conform to ASTM C260.

H. Water reducing/retarding admixtures shall comply with ASTM C494, Type D.

I. Water reducing admixtures shall comply with ASTM C494, Type A.

J. High range water reducer (HRWR) material shall comply with ASTM C494, Type I,II, F, or G. The use of a high range water reducer is mandatory if silica fume is specified.

2.02 CONCRETE MATERIALS

A. Reinforcement: Reinforcing Bars shall be deformed bars and shall comply with ASTM A615 Grade 60.

B. Chairs and supports shall be constructed of non-corrosive material such as plastic or stainless steel.

C. Form ties or wall ties shall be non-metallic.

D. Grout shall be non-shrink grout conforming to ASTM C1107. Unless otherwise specified, grout shall have a minimum compressive strength of 5000 psi at 28 days.

E. Joint filler shall be closed cell neoprene rubber conforming to AASHTO M153 Type I.

F. Joint Sealants: Joint sealants shall be a single or multipart polysulfide or polyurethane sealant recommended by the manufacturer for concrete expansion joints ¾ of an inch wide or wider and meeting the specifications below. Submit manufacturer's information to the Engineer for approval.

1. Horizontal surfaces, 3 Percent Slope, Maximum. Material shall comply with ASTM C920, Type S or M, Class 35 or greater.

2. Vertical Surfaces or horizontal surfaces with greater than 3 Percent Slope. Material shall comply with ASTM C920, Type S or M, Grade NS, Class 35 or greater.

3. Examples of suitable sealants for vertical or sloping joints (non-sag sealant) are Vulkem 921 and Sikaflex 15LM.

G. Backing rods shall be the closed cell polyethylene type complying with ASTM C1330.

H. Bearing pads shall be closed cell neoprene AASHTO grade with a shore durometer hardness of 60. Thickness shall be 1/2 inch unless specified otherwise on the drawings.

I. Steel shims for shimming beam bearing locations and other structural members shall be 316 stainless steel. Shimming shall be limited to 3/8 of an inch in total height unless otherwise approved by the Engineer.

2.03 CONCRETE MIX DESIGN FOR SHEET PILE CAPS

A. Concrete Mix Design for the Sheet Pile Caps shall be as follows:

Minimum Compressive Strength:	5,500 psi
Minimum Cementitious Materials Content:	658 lb/cy
Maximum Water-to-Cement Ratio:	0.40
Fly Ash Content:	18-25%
Silica Fume Content:	7-10%

Corrosion Inhibiting Admixture:	None required
Max Aggregate Size:	1 inch (#57 stone acceptable)
Air Content:	3-6%
Slump:	2-4 inches (if high range water reducer used then 4-8 inches)
High Range Water Reducer Required Yes/No	Yes, brand and amount per Contractor
Max Temperature at Time of Placement	95 degrees

2.04 CONCRETE MIX DESIGN FOR ANCILLARY CONSTRUCTION ITEMS

A. Concrete Mix Design for all other concrete construction items shall be as follows:

Minimum Compressive Strength:	3,000 psi
Minimum Cementitious Materials Content:	470 lb/cy
Maximum Water-to-Cement Ratio:	0.53
Fly Ash Content:	None Required
Silica Fume Content:	None Required
Corrosion Inhibiting Admixture:	None Required
Max Aggregate Size:	1 inch (#57 stone acceptable)
Air Content:	1-6%
Slump:	3-4 inches
High Range Water Reducer Required Yes/No	No
Max Temperature at Time of Placement	95 degrees

PART 3 EXECUTION

3.01 GENERAL CONCRETE NOTES

A. Concrete work shall comply with ACI 318 and local municipal and state building codes. The Contractor shall be responsible for coordinating with local code officials regarding inspection and other requirements including special inspection requirements. The Engineer shall observe all formwork and reinforcement before concrete placement unless otherwise approved by the Engineer in written correspondence (e-mail is acceptable). The Contractor shall coordinate with the Engineer regarding expected evaluation times and shall give at least 2 full days notice when “ready for evaluation.”

B. Formwork for concrete shall be designed by the Contractor and shall comply with ACI 347R.

C. Reinforcement bending, placement, and detailing shall conform to ACI 318 and CRSI's “Manual Of Standard Practice”.

D. Reinforcement Bar Splicing

1. Unless noted otherwise, minimum lap splices for reinforcing bars shall be:

#3 to #6 bars

Bottom bars:	34 bar diameters
Top, side, and all other bars:	44 bar diameters

#7 and Larger Bars

Bottom bars:	55 bar diameters
Top, side, and all other bars:	72 bar diameters

E. Cover: Concrete cover for reinforcement shall be 3 inches clear from the outer most piece of reinforcement (including stirrups) unless noted otherwise.

F. Chamfer all exposed concrete edges 3/4 inch unless otherwise shown on the Drawings.

G. All concrete shall be placed monolithically unless an expansion or construction joint is clearly shown on the drawings.

3.02 PLACING CONCRETE

A. General

1. Concrete shall be placed within 90 minutes of batching or before the truck mounted mixer drum has revolved 300 revolutions unless otherwise approved by the Engineer. Placing of concrete shall be in accordance with the applicable requirements of Chapter 5 of ACI 304R, ACI 304.2R and the requirements of this section.

B. Jobsite Addition of Water

1. Jobsite addition of water to the concrete mix is strictly forbidden unless agreed upon by the Engineer in writing prior to placement. Approval by the Engineer (for adding water) does not guarantee or imply final acceptance of the concrete.

2. Unauthorized jobsite additions of water may result in the concrete being rejected and may require demolition of the concrete at no expense to the Owner or Engineer.

3. If agreed upon by the Engineer, the Contractor shall ensure the following:

a. The Contractor shall hold a pre-concreting conference to establish proper procedures for jobsite addition of water as well as to determine who is authorized to request a jobsite water addition.

b. Jobsite addition of water shall comply with ASTM C94.

c. A minimum of 4 concrete sample cylinders shall be taken and tested after the addition of water to the concrete. The amount of water added and the estimated remaining

cubic yardage of concrete in the truck shall be recorded. This information and the sample (cylinder) numbers shall be supplied to the Engineer within 48 hrs.

d. The addition of water shall not result in exceedance of the maximum w/c ratio or maximum slump.

e. The suppliers batch ticket shall indicate the w/c ratio as batched and clearly indicate the volume of water withheld at the batch plant

f. The ready-mix truck shall contain a visible water meter to accurately quantify the volume of water added at the jobsite

g. The ready-mix truck shall provide an additional 30 revolutions of the mixer drum after the addition of water.

h. When water is added to the concrete at the jobsite, the Contractor's geotechnical/material testing technician in charge of overseeing concrete testing (or the Contractor's geotechnical/material testing engineer) shall be present on the job site and shall record all data as required herein.

C. Transfer from Truck to Forms

1. Transfer concrete from the mixer to the forms as rapidly as practical. Prevent segregation or loss of ingredients. Clean concrete transfer equipment thoroughly before each batch. Do not use aluminum pipe or aluminum chutes. Remove concrete which has segregated during transfer and dispose of as directed.

D. Vibration

1. Comply with the requirements of ACI 309R using vibrators with a minimum frequency of 9,000 vibrations per minute (VPM). Use only high cycle or high frequency vibrators. Motor-in-head 60 cycle vibrators may not be used. Provide a spare vibrator at the casting site whenever concrete is placed. Place concrete in 18 inch maximum vertical lifts. Insert and withdraw vibrators approximately 18 inches apart. Penetrate at least 8 inches into the previously placed lift with the vibrator when more than one lift is required. Extract the vibrator using a series of up and down motions to drive the trapped air out of the concrete and from between the concrete and the forms.

E. Cold Weather

1. Do not mix concrete when the air temperature is below 45 degrees and falling. Comply with ACI 306.1 for cold weather placement. Do not allow concrete temperature to decrease below 50 degrees F.

F. Hot Weather

1. Hot weather concreting shall be defined as placement of concrete when the forecasted high temperatures are predicted to reach 90 degrees F or above within 72 hours of concrete placement. Placement of concrete in hot weather shall comply with the following and with ACI 305R.except as modified herein:

a. The Contractor shall place concrete within 60 minutes of batching for hot weather concreting.

b. The Contractor shall cool the concrete so that the concrete is below 95 degrees F at time of placement. Concrete exceeding 95 degrees F at time of offloading from the

truck shall be rejected. Cool concrete by the addition of ice, by cooling aggregates before mixing or other suitable means. Start continuous moisture curing as soon as the surface of the fresh concrete is sufficiently hard to permit curing without damage. Provide water hoses, pipes, spraying equipment, and water hauling equipment, where job site is remote to water source, to maintain a moist concrete surface throughout the curing period. For silica fume concrete, the use of high-pressure pressure washers capable of providing an even spray of atomized water over the entire concrete surface during the time from initial set to final set is mandatory. For vertical surfaces, protect forms from direct sunlight, keep forms wet and add water to top of structure once concrete is set.

c. The Contractor shall cure the concrete in accordance with Method 1 or Method 2 in the CURING AND PROTECTION section of this specification.

3.03 CONCRETE FINISHING

A. Unless noted otherwise, concrete finishes shall be as follows:

1. Concrete below grade: rough form finish

2. Formed concrete above grade: smooth form finish

3. Non-formed concrete surfaces: hand troweled finish

4. Walking surfaces (including tops of seawall caps): hand troweled with broom finish

5. Tie-holes and defects: patch with non-shrink grout

3.04 CURING AND PROTECTION

A. General

1. Concrete shall be cured in accordance with the methods listed below. Silica fume concrete shall be cured using method 1 for at least 72 hours followed by method 2 for an additional 4 days. Other methods may be considered by the Engineer if the Contractor provides sufficient documentation that the method has produced good field results. Concrete shall be cured in accordance with ACI 308.1 except as modified herein. The materials and methods of curing shall be subject to approval by the Engineer. The Contractor is advised that concrete containing silica fume is subject to plastic shrinkage cracking. The Contractor shall take whatever precautions are necessary to prevent plastic shrinkage cracking. The presence of plastic shrinkage cracking shall constitute a sole reason for rejection of the concrete and non-acceptance.

B. Method 1 – Fog Spraying Followed by Continuous Moist Curing (Silica Fume Concrete)

1. Fog spraying in accordance with ACI 308.1 shall be utilized between concrete placement and initial set. Install wind breaks before fogging and leave in place until fogging has ceased. As soon as concrete has set sufficiently, apply 72 hours of continuous moist curing by continuous sprinkling (sprinklers or soaker hoses) combined with continuous covering using wet burlap. After 72 hours, continue with sprinkling or cover with plastic sheeting as outlined in section 2 or section 6 of ACI 308.1. Maintain moisture beneath plastic sheeting by re-wetting as necessary. Do not allow surface of concrete to dry out between applications of water. Continue moist curing for an additional 4 days (7 days total). Keep forms wet for 7 days or until removal. Surfaces exposed upon removal of forms shall be cured as previously described. Forms covering the bottom surfaces of members shall stay

in place for a minimum of 7 days or Contractor shall provide an engineer approved acceptable curing method for bottom surfaces.

C. Method 2 – Continuous Moist Curing

1. As soon as concrete has set sufficiently, apply moist curing by continuous sprinkling, covering with burlap or covering with plastic sheeting as outlined in section 2 or section 6 of ACI 308.1. Wet the burlap or plastic sheeting at intervals necessary to maintain moisture over the entire concrete surface (minimum twice daily). Do not allow the concrete surface to dry out between applications of water. Keep forms wet for 7 days or until removal. Surfaces exposed upon removal of forms shall be cured as described above. Forms covering the bottom surface shall stay in place for a minimum of 7 days or Contractor shall provide an engineer approved acceptable curing method for bottom surfaces. Continue moist curing of concrete for a minimum of 7 days.

D. Method 3 - Liquid Membrane-Forming Curing Compounds

1. Note: Do not use this method of curing if the predicted high temperature during the first 3 days of use is greater than 85 degrees.

2. Apply chlorinated-rubber based curing compound meeting the requirements of ASTM C309 immediately after finishing. Use a power sprayer for fast application and apply curing compound in accordance with the manufacturer's instructions. Forms shall be kept wet until removal. Apply curing compound to all areas where formwork is removed before 7 days. Curing compound shall be removed from all visible surfaces or as instructed by the Engineer. Do not remove curing compound for seven days unless otherwise approved by the Engineer.

3.05 FORMWORK REMOVAL

A. The Contractor shall remove formwork according to the following schedule:

1. If hot weather concreting as defined in the PLACING CONCRETE section of this specification applies, remove formwork 7 days following placement.

2. If hot weather concreting as defined in the PLACING CONCRETE section does not apply, remove formwork a minimum of 72 hours following placement, or when the compressive strength of the concrete test cylinders meets 70% of the specified compressive strength.

3.06 CONCRETE ACCEPTANCE

A. Acceptance of the concrete shall be determined solely by the Engineer and shall be based on the following criteria:

1. Concrete meeting the specified minimum strength criteria.

2. The absence of structural cracking and/or plastic shrinkage cracks.

3. Good workmanship and concrete meeting placement tolerances.

4. Proper finishing including the grouting of formwork mounting holes, form-tie holes, etc.

5. Proper curing and formwork removal.

6. Proper installation of expansion and construction joints.

7. Installation in accordance with these specifications.

B. Reasons for Rejection of Concrete: Concrete may be rejected based on inadequacies related to the acceptance criteria listed above as determined by the Engineer.

C. Acceptance of concrete strength tests shall be in accordance with section 5.6 of ACI 318.

D. Rejected concrete shall be demolished in accordance with the Engineer's instructions and disposed of offsite at no cost to the Owner.

3.07 CONCRETE REPAIR

A. Damaged or cracked concrete not rejected by the Engineer shall be repaired in general accordance with ACI 546R. The Engineer shall specify or approve all repair methods and materials.

3.08 CONCRETE CONSTRUCTION TOLERANCES

A. The surface of the concrete seawall caps shall be installed to within plus or minus 1 inch of the specified elevation.

B. Tolerances shall comply with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials" unless otherwise noted herein. Unless noted otherwise, concrete surfaces shall adhere to a Class C finish. Walking surfaces shall be assigned a floor classification of "conventional".

-- END OF SECTION --

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SECTION 31 23 00

EXCAVATION AND GRADING

PART 1 GENERAL

1.01 SUMMARY

A. This section includes requirements for furnishing of labor, materials, and equipment necessary for site excavation, transfer to proposed fill areas, grading, and other earthworks as indicated on the Project Drawings.

1.02 REFERENCES

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

A. Florida Trench Safety Act (90-96, Laws of Florida)

B. OSHA Excavation Safety Standards 29, CFR part 1926.650 Subpart P

1.03 EXCAVATION

1. Excavation operations shall include the removal of material encountered above proposed grade elevations and to lines and dimensions indicated on the Project Drawings.

2. All areas to be excavated shall be in accordance with the Project Drawings and shall not exceed the specific areas and depths indicated on those drawings. The Contractor is not authorized to excavate outside of the area or elevations depicted.

3. Excavation equipment shall be capable of removing material accurately without over excavating or damaging adjacent structures.

4. All excavation operations shall be in accordance with the Florida Trench Safety Act, which establishes the safety standards of OSHA 29 CFR, Part 1926, Subpart P.

5. The Contractor shall be responsible for investigating and verifying the locations and depths of all utility crossings. The Contractor will take precautions against damages which might result from his operations. If any damage occurs because of his operations, the Contractor will be required to suspend excavation or grading operations until the damage is repaired and accepted by the Owner and the Engineer. Costs for such repairs and for the downtime of the equipment and manpower shall be at the Contractor's expense.

6. Damage to structures because of the Contractor's negligence will result in suspension of work and require prompt repair at the Contractor's expense and subject to acceptance by the Engineer as a pre-requisite to the resumption of work.

PART 2 PRODUCTS

2.01 SOIL MATERIALS

A. Material Source: The intent of the project is to obtain all earthwork material from the project areas as shown in the Project Drawings. The Contractor shall base his or her bid accordingly.

B. Suitable Fill Material: Materials meeting the requirements of the Sediment Quality Control / Quality Assurance Plan (see Appendix B-1 – FDEP Permit for East Pass and Destin Harbor Dredging).

C. Unsuitable Material: Materials unsuitable for use beach fill are defined as follows:

a. Materials not meeting the requirements of the Sediment Quality Control / Quality Assurance Plan.

b. Materials containing roots greater than one (1) inch in diameter, logs, scrap lumber, metal objects, plastic and fiberglass objects, concrete construction refuse, and other objectionable debris.

c. Materials containing brush, sod, organic, and other perishable materials.

d. Material containing rocks or rubble greater than ¾ inch in diameter.

PART 3 EXECUTION

3.01 GENERAL

A. The contractor shall conduct all excavation, backfill, grading, and other earthworks as outlined herein, on the Project Drawings.

3.02 UNAUTHORIZED EXCAVATION

A. Unauthorized excavations and related fill activities shall only be performed as directed by the Engineer.

3.03 STORAGE AND PROTECTION OF SOIL MATERIALS

A. Excavated materials shall be transferred to the proposed fill area. The material shall not be stockpiled beyond the proposed fill areas without authorization by the Engineer.

B. Protect newly graded areas from traffic and erosion. Keep free of trash and debris. Repair and reestablish grades to the specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

C. Unless noted or directed otherwise by the Engineer, transport unsuitable soil material offsite and dispose of in accordance with federal, state, and local laws and regulations.

D. The Contractor shall conduct his operations in such a manner that material or other debris is not pushed outside of excavation limits or otherwise deposited in areas outside of approved

placement areas. The Contractor will be required to change his method of operations as required to comply with the above requirements.

3.04 FILL PLACEMENT

A. Following excavation, the contractor shall grade and dress the excavation area and beach fill area. Final dressing shall include the removal of humps, depressions, access ramps, etc. to create smooth and uniform final surface.

3.05 FINISH GRADING AND TOLERANCES

A. Berm tolerances shall be the same as those discussed in Section 35 20 23 – Hydraulic Dredging and Beach Fill of these specifications.

B. The intent is to provide a graded area free of abrupt humps or depressions in surfaces or bulges in the berm embankment.

3.06 ACCEPTANCE OF EXCAVATION AND GRADING

A. Final grades and elevations shall be to the lines and elevations shown on the Project Drawings within the finish grading and tolerances sections of these specifications. At the end of the project, but before substantial completion, the Contractor shall perform an as-built survey of the final grades and elevations. The survey shall be signed and sealed by a professional surveyor licensed in the state of Florida. The Contractor shall submit the final as-built survey to the Engineer for review and acceptance.

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SECTION 31 41 16

FRP (FIBER REINFORCED POLYMER) SHEET PILING

PART 1 GENERAL

1.01 SUMMARY

A. This section includes requirements for furnishing labor, materials, and equipment necessary to install the sheet pile.

1.02 DEFINITIONS

A. Engineer: The Engineer as designated by the owner in charge of construction oversight.

B. Engineer of Record: The Engineer whose signature and seal is affixed to the Drawings and Specifications.

1.03 REFERENCES

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

A. American Society for Testing and Materials (ASTM)

ASTM D638 Standard Test Method for Tensile Properties of Plastics

ASTM D695 Standard Test Method for Compressive Properties of Rigid Plastics

B. American Wood Preservers' Association (AWPA)

AWPA U1 User Specification for Treated Wood

1.04 PRECONSTRUCTION SUBMITTALS

The Contractor shall provide the following submittals for Engineer approval at least 14 days (unless otherwise noted) prior to ordering materials:

A. <u>Sheet Piling Installation Method and Equipment:</u>

1. Submit complete description of sheet piling installation method, including mandrels, hammers, and equipment before mobilizing equipment.

2. Jetting Plan: Before any jetting can be used, the Contractor shall provide a Jetting Plan for Engineer review and acceptance. The jetting plan shall include the number of pumps, estimated pump flow rate, pump pressure, number and diameter of jet pipes, type and diameter of jet nozzles, and equipment used to maneuver and support the jet pipes.

B. Sheet Piling Material Data:

1. Submit sheet piling manufacturer's data for Engineer approval.

2. Certification that the material was produced in accordance with the manufacture's quality control plan in an ISO 9001 certified manufacturing facility.

C. Driving Records

1. The Contractor shall maintain driving records for the sheet pile walls including final toe elevation, whether a mandrel was used, whether jetting was used, whether a vibratory hammer was used, hammer settings, rate of penetration, whether obstructions or hard soil encountered, and production rate each day in square feet of sheet pile and station number. Submit driving records weekly.

D. As-Built Survey of Sheet Piling Walls

1. Submit as-built survey(s) (signed and sealed by a Professional Surveyor/Mapper) upon completion of each sheet piling wall element for verification of installation tolerances.

1.05 DELIVERY, STORAGE AND HANDLING

A. Materials delivered to the site shall be new and undamaged. Material shall be transported, stored and handled in the manner that will prevent permanent deflection, distortion or damage.

PART 2 PRODUCTS

2.01 GENERAL

A. All material shall be new and delivered in undamaged condition. The Contractor shall not install used or damaged material.

2.02 FRP COMPOSITE SHEET PILING

A. FRP composite sheet piling shall consist of either polyester or vinyl ester. Resin shall contain U.V. stabilizers to provide sufficient resistance to ultra violet light degradation. The glass reinforcement shall be in the form of continuous roving, woven roving or stitched fabrics, and surface matting.

B. Material shall be produced in accordance with the manufacture's quality control plan in an ISO 9001 certified manufacturing facility.

C. The FRP sheet pile shall be Z-shaped with a ball and socket interlock and shall be gray or charcoal in color unless otherwise approved by the Owner.

D. Composite sheet piling shall meet the following minimum material properties:

Minimum Tensile Yield Strength (ASTM D638):	58 ksi
Minimum Tensile Modulus (ASTM D638):	3,700 ksi

Minimum Compressive Strength (ASTM D695):	50 ksi
Minimum Compressive Modulus (ASTM D695):	3,200 ksi

E. Composite sheet piling shall meet the following physical properties:

Heavy FRP Composite Sheet Pile Section

Minimum Section Modulus:	38.0 in3/ft
Minimum Moment of Inertia:	266 in4/ft
Minimum depth:	14 in
Minimum Web Thickness:	0.400 in
Minimum Flange Thickness:	0.430 in

Light FRP Composite Sheet Pile Section

Minimum Section Modulus:	13.0 in3/ft
Minimum Moment of Inertia:	52 in4/ft
Minimum depth:	8 in
Minimum Web Thickness:	0.25 in
Minimum Flange Thickness:	0.265 in

F. Timber Cap: Timber for the timber cap shall be pressure treated #2 Southern Pine or better. Timber shall be pressure treated in accordance with AWPA U1 to the requirements for use UC5C marine use in southern waters. Bolts, treaded rods, and fasteners for attaching the timber cap to the sheet pile shall be 316 stainless steel. All bolts and treaded rods shall have a 316 stainless steel washer at the head and nut end.

G. Concrete Cap: Concrete for the concrete cap shall conform to the Construction Drawings and the specification for concrete.

PART 3 EXECUTION

3.01 UNANTICIPATED SOIL CONDITIONS

A. If during the performance of the work, the Contractor notices significantly different soil conditions from those shown in the Construction Drawings or geotechnical report(s), the Contractor shall notify the Engineer immediately.

3.02 INSTALLATION OF SHEET PILING

A. **The Contractor is advised that the geotechnical borings indicate hard driving conditions may exist. The Contractor shall plan for installing FRP composite sections with the aid of a driving mandrel when hard driving conditions are encountered.**

B. **The Contractor shall mobilize a mandrel, suitable for each type of sheet piling, upon mobilization for sheet piling, and associated driving equipment to the project site. The mandrel shall remain at the project site until installation of the sheet pile section is complete unless demobilization is otherwise authorized by the Engineer. See Section 01 29 00 – Measurement and Payment for payment information.**

C. Handle and store all sheet piling in a manner to prevent damage. Handle sheet piling with fabric slings or braided wire rope having sufficient lifting capacity and placed at appropriate lift points as specified by the manufacturer to prevent damage due to excessive bending.

D. Placing and Installation:

1. Installation shall be in accordance with manufacturer's guidelines.

2. The Contractor shall use a vibratory hammer as recommended by the sheet pile manufacturer to install the sheet piling to the minimum tip elevations shown in the Construction Drawings.

3. If required, the Contractor may use a mandrel to assist sheet piling installation. The Contractor shall base his/her bid on the assumption that all sheet piling installation requires the use of a mandrel. See Section 01 29 00 – Measurement and Payment for payment information.

4. Terminal End Walls and T-groin Walls:

   a. Jetting is not allowed unless a jetting plan is submitted, reviewed and accepted in writing by the Engineer. For bidding purposes, the Contractor shall assume no jetting is allowed and a mandrel is used for hard driving conditions. The jetting plan shall ensure that soils are not overly loosened or displaced to the satisfaction of the Engineer.

5. Return Walls and Cross Point Walls:

   a. Jetting is allowed assuming that the Contractor installs these walls after placing fill (i.e. dredged material) as shown in the Construction Drawings.

6. If needed, the Contractor shall provide temporary wales, templates, or guide structures shall be provided to ensure that the pilings are placed and driven to the correct alignment. Use a system of structural framing sufficiently rigid to resist lateral and driving forces and to adequately support the sheet piling until design tip elevation is achieved.

7. Installation Tolerances:

   a. Top of pile at elevation of cut-off: +/- 1 inch vertically of the elevation specified.

   b. Top of concrete cap: +/- 1 inch vertically of the elevation specified.

   c. Horizontal location sheet pile: +/- 12 inches horizontally of the specified location.

   d. Bottom (Tip) elevation of sheet pile: +/- 3 inches of the elevation specified.

E. Inspection of Pilings

1. Perform continuous inspection during piling installation. Inspect all pilings for compliance with tolerance requirements. Bring any unusual problems which may occur to the attention of the Engineer. The Contractor shall inspect the tongue and groove joints of pilings extending above the ground. Pilings found to be out of interlock shall be removed and replaced at the Contractor's expense.

2. Suspected Damage Due to Unusual Installation Conditions

   If hard driving or obstructions are encountered or pilings are installed to refusal, the Contractor shall pull, as directed by the Engineer, selected pilings after driving to determine the condition of the underground portions of pilings. Any piling pulled and found to be damaged, to the extent that its usefulness in the structure is impaired, shall be removed and replaced at the Contractor's expense. Pilings pulled and found to be in satisfactory condition shall be re-installed as directed.

F. Cutting and Drilling

FRP sheet pile shall be cut using carbide edged masonry blades and drilled with carbide or cobalt tipped bits.

G. Repair

For slight damage or gouges, FRP sheet pile may be repaired per the manufacturer's recommendations. If in the opinion of the Engineer the damage is severe, the Contractor shall replace the sheet pile at no cost to the Owner.

3.03 STABILITY AND PROTECTION OF SHEET PILE DURING CONSTRUCTION

A. The Composite sheet pile has been designed to withstand reasonable anticipated forces from wave and current loads based on the proposed Construction sequence shown on the Construction Drawings. The Contractor shall not deviate from the proposed construction sequence except at his/her own risk.

B. The composite sheet pile has been designed to withstand a force from a 3 ft wave after excavation and before installation of the armor stone and dredged material (water depth approximately 15.0 to 15.5 ft deep).

C. The sheet pile has been designed for acceptable material stresses due to placement of armor stone up to within 2 ft of the top of sheet pile along the seaward face during construction assuming careful placement and no impact loading from dropped or rolling stone. Design calculations indicate that deflections after rock placement without bracing will exceed the 6 inch tolerance specified.

D. The Contractor shall shore and/or brace the sheet pile as needed to control deflections to specified tolerances during installation of the armor stone and placement of the dredged material.

E. Tolerances for sheet pile wall deflection during construction shall be 6 inches maximum horizontal deflection measured at the top of wall and no individual section or sections of the wall shall be more than 3 inches out of alignment when a 20 ft long string is pulled along the face of the wall.

3.04 SHEET PILE WALL CAP

A. Install concrete or timber cap as described in the Construction Drawings and Specifications.

3.05 ENGINEER SITE VISITS AND OBSERVATION

A. The Contractor shall coordinate with the Engineer to observe the initial and/or final sheet piling installation before placing formwork and steel reinforcing for the concrete cap.

B. Undamaged sheet piling and components installed in a neat and workmanlike manner and accordance with the Construction Drawings and Specifications shall be accepted.

3.06 AS-BUILT DRAWINGS

A. The Contractor shall submit an as-built survey of the completed sheet piling walls upon completion of the sheet piling installation.

B. The survey shall be submitted for each wall before rock placement or cap construction for verification of installation tolerances unless otherwise approved by the Engineer.

C. Placement of rock and cap construction shall not proceed until the Engineer approves the as-built survey for each sheet piling wall.

-- END OF SECTION --

SECTION 35 20 23

HYDRAULIC DREDGING AND BEACH FILL

PART 1 GENERAL

1.01 SUMMARY

A. The work covered by this section consists of furnishing all labor, materials, equipment, supplies, and performing all operations necessary to:

1. Hydraulically dredge the dredging template within the East Pass Federal Navigation Channel and Destin Harbor Entrance Channel as indicated in the Project Drawings;

2. Transfer all dredged material to the Project Area as shown in the Project Drawings and in accordance with the Contract Documents.

B. Dredging shall be conducted from a vessel, such that the fully loaded draft does not cause bottom scouring. All watercraft associated with the execution of the permitted project shall only operate within waters of sufficient depth so as to preclude bottom scouring, prop dredging, grounding, and damage to the submerged bottom or adjacent submerged aquatic resources. Permanent and temporary impacts to surrounding wetland areas, surface waters, and submerged natural resources are not authorized.

C. The Contractor is advised that the dredging limits and dredging depths are irregular. For this reason, the Engineer will provide the Contractor with a digital survey files from the most recent survey as referenced on the Project Drawings for the Contractor to upload into on-board software (e.g. DREDGEPACK®). The Engineer expects that the Contractor will utilize such software for this project.

D. The proposed navigation channels have been maintained and frequently dredged by the U.S. Army Corps of Engineers (USACE) since the channels were established. Previous studies and past maintenance dredging projects have indicated that the materials that shoal within the navigation channels are clean, beach-quality sand. However, the Contractor is advised that the possibility exists that discrete occurrences of non-beach compatible sediments or debris may exist within the proposed dredging area. The Contractor shall carefully review the post-dredge geotechnical report from the USACE 2009/2010 dredging project (Appendix D-3), prior to selection of dredging and placement means and methods. The Contractor is also encouraged to contact the USACE Panama City Field Office at (850) 784-9780 for additional information regarding past East Pass maintenance dredging projects.

E. Throughout all phases of the project, the Contractor shall remain responsible for ensuring that all work complies with the requirements specified in the regulatory permits and in Section 01 35 43 – ENVIRONMENTAL PROTECTION. Failure to meet the environmental protection requirements of the aforementioned permits or of these Specifications may result in work stoppages or termination for default. The Contractor shall make no part of the time lost due to any such work stoppages the subject of claims for extensions of time or for excess costs or damages. If Contractor fails or refuses to promptly repair any damage caused by violation of the provisions of these permits and/or Specifications, the Owner may have the necessary work performed and charge the cost thereof to the Contractor.

1.02 SUBMITTALS

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

A. Hydraulic Dredging and Material Transfer Plan

1. At least seven (7) calendar days before the scheduled pre-construction conference, the Contractor shall submit a Hydraulic Dredging and Material Transfer Plan to Engineer for review and acceptance. The Engineer reserves the right to reject any plan which, in his opinion, may be detrimental to the stability of the placed fill material, existing structures or navigation channels, which may unduly disrupt access to or use of the navigation channels or project area by the public during placement operations, or for any other credible reason. In reviewing the plan, Engineer may consider how the Contractor intends to address each of the following:

    a. Proposed dredging and support vessel equipment;

    b. Proposed means and methods for ensuring that the dredge cutterhead remains within the specified limits of dredging and within the depth tolerances;

    c. Estimate of daily dredging productivity;

    d. Proposed booster pump locations and noise muffling devices (if necessary);

    e. Proposed in-water pipeline layout demonstrating proposed areas for submerged pipeline and floating pipeline;

    f. Proposed means for securing submerged pipeline to the bottom;

    g. Proposed means for marking floating pipeline and other safety measures;

    h. Proposed work areas and measures for ensuring public safety;

    i. Proposed anchoring areas with specific consideration of submerged natural resources;

    j. Proposed pipeline material data;

    k. Estimate of maximum pipeline pressure;

    l. Turbidity management/monitoring procedures;

    m. Proposed dredging sequence and acceptance sections.

B. Maintenance of Marine Traffic Plan

1. At least seven (7) calendar days before the scheduled pre-construction conference, the Contractor shall submit a Maintenance of Marine Traffic Plan to Engineer for review and acceptance. The plan — addressing traffic within the waterbody — must clearly demonstrate, via narrative and illustrative documentation:

    a. Methodology for avoiding disruption of ongoing marine traffic to the maximum extent possible;

    b. Documentation of Contractor coordination with the U.S. Coast Guard and if possible, local marine industry groups.

C. Notice to Mariners

1. Prior to the commencement of Work on this Contract, the Contractor shall notify the Commander, Eighth Coast Guard District in New Orleans, Louisiana of his intended operations to dredge and request that it be published in the Local Notice to Mariners. This notification must be given in sufficient time so that it appears in the Notice to Mariners at least two weeks prior to the commencement of this dredging or water-dependent mobilization operations. A copy of the notification shall be provided to the Engineer.

D. Notification of Aids to Navigation Relocation/Dredging Aids

1. Unless expressly stated in the Project Drawings, the Contractor shall not remove, change the location of, obstruct, willfully damage, make fast to, or interfere with any aid to navigation without written consent from the U.S. Coast Guard. Within seven (7) calendar days following receipt of the Notice of Award, the Contractor shall notify the Commander, Eighth Coast Guard District in New Orleans, Louisiana of his plan to dredge adjacent to any aids which require relocation to facilitate dredging. This notification must be given immediately so that it appears in the Notice to Mariners at least 14 days prior to the commencement of this operation. This notification shall be immediately followed by formal written request with a copy to the Engineer. The Contractor shall contact the U.S. Coast Guard for information concerning the position to which these aids will be relocated.

2. The Contractor shall include in the notification any intended operations to install lighted aids to navigation, if proposed by the Contractor.

3. The Contractor shall submit verification of approval from the U.S. Coast Guard for all buoys, dredging aid markers, and pipeline makers to be placed in the water.

E. Pre-Dredging Bathymetric Survey

1. At least fifteen (15) days prior to the commencement of dredging activities within an acceptance section as identified with the accepted Hydraulic Dredging and Material Transfer Plan submittal, Contractor shall perform a pre-dredge bathymetric survey of the project dredge area. Submittal shall meet the requirements of the “Surveys” section in this Specification. Note that all dredging surveys used to determine pay quantities shall be conducted by an Engineer-accepted bathymetric surveyor licensed in the State of Florida (See SECTION 01 45 16 – CONTRACTOR QUALITY CONTROL). The Engineer must review and accept the pre-dredge survey prior to any dredging activity.

F. Daily Dredging Report of Operations

1. For each day of dredging operations, the Contractor shall prepare and submit to Engineer one (1) copy of the Daily Report of Operations. Construction forms and details utilized by the Contractor shall be obtained from the construction forms and details provided by the U.S. Army Corps of Engineers provided at the following web address: http://www.saj.usace.army.mil/About/DivisionsOffices/Engineering/DesignBranch/SpecificationsSection.aspx or similar. These reports shall be submitted to the Engineer in Adobe PDF format by 9:00 a.m. on the day following the day covered by the report. Upon completion of the job, Contractor shall summarize the daily reports in a consolidated job report and submit this report to Engineer.

G. Notification of Discovery of Historical Resources

1. Contractor shall immediately notify Engineer if any shipwreck, artifact, or other objects of antiquity that have scientific or historical value, or are of interest to the public, are discovered, located, and/or recovered. Contractor acknowledges that the site(s), articles,

or other materials are the property of the State of Florida, with title vested in the Department of State, Division of Historical Resources.

H. Equipment Inventory Record

1. Contractor shall develop a method of inventory for all anchors, buoys, buoy cables, grade stakes, etc. used in the construction of the project. The record shall include information concerning the location, installation, and recovery of all equipment at the completion of the project. Upon completion, the Contractor shall furnish the log to the Engineer.

I. Notice of Misplaced Material

1. Contractor shall immediately notify the U.S. Coast Guard Marine Safety Office and the Engineer of any misplaced material (e.g., dredge pipe, cable, navigational aids, etc.).

J. Post-Construction Bathymetric Survey

1. Within seven (7) days of the completion of dredging activities within an Acceptance Section, the Contractor shall perform the post-dredge bathymetric survey. Submittal shall meet the requirements of the "Surveys" section in this Specification. Note that all dredging surveys used to determine pay quantities shall be conducted by an Engineer-accepted bathymetric surveyor licensed in the State of Florida (See SECTION 01 45 16 – CONTRACTOR QUALITY CONTROL). The Engineer must review and accept the post-dredge survey prior to any dredging payments.

K. Quality Control Sand Samples

1. Refer to Section 3.08 Quality Control for Beach Placement of Sand.

1.03 DEFINITIONS

A. Limits of Dredging: The areas in which the dredge is free to excavate material as shown in the Project Drawings. The Engineer may approve additional dredging areas within the navigation channels. All vessels and construction equipment, tools, and dredging activities shall maintain the following minimum setback distances unless shown as otherwise in the Project Drawings:

1. Structures and utilities: minimum 25 feet

2. Anchoring, spudding of vessels, storage, stockpiling or access of equipment on, in, over or through submerged aquatic vegetation is strictly prohibited. Contractor shall remain setback from these protected areas the maximum distance practical. See Section 01 35 43 ENVIRONMENTAL PROTECTION.

B. Design Depth: The proposed dredging design depth for the East Pass navigation channel from Station 40+00 to Station 146-00 is -14 feet, Mean Lower Low Water (MLLW). The dredging design depth for the Destin Harbor (Old Pass Lagoon) Entrance Channel from Station 0+00 to Station 13+00 is -12 feet MLLW. The dredging design depth from Station 13+00 to Station 24+00 is -6 feet MLLW.

C. Allowable Overdepth: To provide for tolerances in the dredging process, the permit allows that the Contractor may remove material within the designated areas to a maximum depth of 2 feet below the Design Depth. Contractor WILL NOT RECEIVE PAYMENT FOR ANY AND ALL DREDGING BELOW THIS ALLOWABLE 2 FOOT OVERDEPTH.

D. Side Slopes: The side slopes shown on the drawings are provided for payment purposes only. Side slopes may be formed by box cutting, step cutting, or dredging along the side slope. Material

actually removed, confined by the “Limits of Dredging”, to provide for final side slopes not flatter than that shown on the Project Drawings, but not in excess of the amount originally lying above the limiting side slope, will be measured and paid for in accordance with SECTION 01 29 00 MEASUREMENT AND PAYMENT.

1.04 ORDER OF WORK

A. The Contractor shall follow the proposed order of work unless an alternative plan has been reviewed and accepted by the Engineer. Dredge material shall not be discharged within the project area until the shoreline stabilization structures are constructed to minimize the potential for any re-entry or re-entrainment back into the inlet or the federal navigation channels of East Pass or Destin Harbor. The Contractor may be required to remove any materials eroded from the project area and deposited within the federal navigation channels, resulting from unprotected erodible soils or improper construction scheduling or planning, at no cost to the Owner. The Contractor may propose an alternative construction sequence; however, must first present a proposed construction plan demonstrating consistency with the Contract Documents for Engineer review and acceptance prior to performing the work. At minimum, the Contractor shall clearly identify proposed controls to ensure material losses from the project area or deposition with adjacent navigation channels do not occur, or the proposed sequencing does not result in additional work or extended schedules.

B. The Contractor shall begin dredging operations at the northern proposed dredge area, between Stations 115+00 to Station 146+00 and proceed to the Destin Harbor entrance channel dredging area only after removing all available material within the dredge template from the northern dredge area. Once all available material is removed from the Destin Harbor entrance channel dredge area (between Stations 3+00 and Station 24+00), the Contractor shall proceed to the southern dredging area between Station 40+00 to Station 75+00. In all dredging areas, the Contractor shall commence at the limit of the proposed dredging area and maintain a continuous excavation operation throughout the entire area without any intervening gaps.

1.05 PUMPING OF BILGES

A. Contractors are warned that pumping oil or bilge water containing oil into navigable waters, or into areas which would permit the oil to flow into such waters, is prohibited by Section 13 of the River and Harbor Act of 1899, approved March 3, 1899 (30 Stat. 1152; 33 U.S.C. 407). Violation of this prohibition is subject to the penalties under the referenced acts.

1.06 UTILITY CROSSINGS

A. The Contractor shall be responsible for investigating the locations and depths of all utility crossings. Contractor will take precautions against damages which might result from his operations, especially the sinking of dredge spuds and/or anchors into the channel bottom, in the vicinity of underwater utility crossings. The Contractor assumes all liability for submerged and buried utility facilities. If any damage occurs because of dredging operations, Contractor will be required to suspend dredging until the damage is repaired and accepted by the Owner and Engineer. Costs for such repairs and for the downtime of the dredge and attendant equipment shall be at Contractor’s expense. The Owner or Engineer shall not be responsible for the cost of such damage and repairs regardless of cause – including but not limited to any costs associated with interruption of utility services and delay damages.

1.07 SIGNAL LIGHTS

A. The contractor shall display signal lights and conduct operations in accordance with the general regulations of the Department of the Army and of the U.S. Coast Guard. This includes lights and day signals to be displayed by towing vessels with tows on which no signals can be displayed; vessels working on wrecks, dredges, and vessels engaged in laying cables or pipe or in submarine or bank protection operations; lights to be displayed on dredge pipe lines; day signals to be displayed by vessels of more than 65 feet in length moored or anchored in a fairway or channel; and the passing by other vessels of floating plant working in navigable channels, as set forth in Commandant U.S. Coast Guard Instruction M16672.2, Navigation Rules: International-Inland (COMDTINST M16672.2), or 33 CFR 81 Appendix A (International) and 33 CFR 84 through 33 CFR 89 (Inland) as applicable.

1.08 HISTORICAL PERIOD SHIPWRECK SITES

A. If any shipwreck, artifact, or other objects of antiquity that have scientific or historical value, or are of interest to the public, are discovered, located, and/or recovered, the Contractor acknowledges that:

1. The site(s), articles, or other materials are the property of the State of Florida, with title vested in the Department of State, Division of Historical Resource; and that,

2. The Contractor shall immediately notify the Engineer and all other parties as required by regulatory permits (Appendix A and B).

Refer to subparagraph "Preservation and Recovery of Historic, Archeological, and Cultural Resources" of Section 01 35 43 ENVIRONMENTAL PROTECTION.

1.09 FINAL CLEANUP

A. Final cleanup shall include the removal of all of the Contractor's plant and equipment either for disposal or reuse. Plant and/or equipment to be disposed of shall ONLY be disposed of in a manner and at locations accepted by the Owner and Engineer. Unless otherwise accepted in writing by the Engineer, the Contractor will not be permitted to abandon pipelines, pipeline supports, pontoons, anchors, markers, or other equipment in the dredge area, upland project area, pipeline access areas, water areas, or other areas adjacent to the work site. Pilings and any other debris removed or created as a result of the execution of this contract shall be disposed of in a manner consistent with these specifications.

1.10 CONTRACTOR RESPONSIBILITIES

A. The Contractor shall exclude the public from the work area in the immediate vicinity of his operations. The Contractor shall install warning signs to warn the public and all commercial and recreational boats of all construction activities. The Contractor shall be responsible for providing and maintaining all water and land access routes necessary for his equipment and plant to and from the work sites. The Contractor shall ascertain the environmental conditions which can affect water and land access, such as climate, terrain, winds, current, waves, swells, depths, shoaling, and scouring tendencies.

1.11 ADJACENT PROPERTY AND STRUCTURES

A. The Contractor shall not enter or place beach fill, equipment, or materials on private properties outside of the project area defined in the Construction Drawings. The Contractor is responsible

for locating the property lines defining the project area. The Contractor shall incorporate sufficient means and methods to ensure construction activities, including but not limited to sand placement, access/traversing, staging, storage, etc., do not occur on private lands adjacent to the project area. Any damage to private or public property within the project boundaries, including staging site(s) and work and access areas/roads, shall be repaired promptly by the Contractor. Any damage as a result of the Contractor's operations shall be repaired at no cost to the Owner and Engineer.

1.12 FUEL OIL TRANSFER OPERATIONS

A. In accordance with U.S. Coast Guard regulations (33 CFR 156.120), couplings used in fuel oil transfer operations on any vessel with a capacity of 250 or more barrels of oil shall be either a bolted or full-threaded connection; or a quick-connect coupling approved by the Commandant; or an automatic back-pressure shutoff nozzle used to fuel the vessel. An executed fuel oil transfer (Declaration) form signed by the tanker operator shall be submitted to the Engineer for each refueling operation. The U.S. Coast Guard shall also be notified prior to any refueling.

PART 2 PRODUCTS

2.01 CHARACTER OF MATERIALS

A. The material to be excavated lies within the East Pass federal navigation channel and the Destin Harbor Entrance Channel. From previous coastal studies, the materials that shoal within the navigational channels are beach quality, and past maintenance dredging projects and geotechnical analyses have demonstrated that sand removed from the navigation channel has characteristics similar to the adjacent beach sand (i.e., white, medium to fine quartz sand with trace amounts of silt and shell). Appendix D-3 provides the post-placement sediment testing results from the USACE's 2009/2010 maintenance dredging project. The tested samples contained well-sorted fine sand with 0.2 – 0.4% fines, minimal shell and gravel (less than 1%), mean grain size ranging from 0.26 – 0.35 mm, and moist Munsell color of 10 YR 7/1. The Contractor shall carefully review the post-dredge geotechnical report (Appendix D-3), prior to selection of dredging and placement means and methods. The Contractor is also encouraged to contact the USACE Panama City Field Office at (850) 784-9780 for additional information regarding past East Pass maintenance dredging projects.

PART 3 EXECUTION

3.01 GENERAL

A. Contractor shall dredge within the Limits of Dredging as necessary to complete the Work as defined in the Project Drawings and Specifications and transport the dredged material to the designated placement area. Contractor shall not dredge outside the Limits of Dredging.

B. Schedule and Work Hours

1. Dredging operations shall not occur until the Contractor is substantially complete with the shore protection structures along the perimeter of the project area to avoid uncontrolled losses of material from the project area and increased deposition within adjacent navigation channels. The Contractor may propose an alternate schedule for Engineer acceptance; however, the Contractor shall clearly identify proposed controls to ensure material losses from the project area or deposition with adjacent navigation channels do not occur, or the proposed sequencing does not result in additional work or extended schedules.

2. Dredging operations are allowed 24 hours a day.

C. Access to Dredge and Support Vessels

1. Contractor shall be responsible for providing and maintaining access necessary for his equipment to and from the Work sites.

2. Contractor shall provide, as requested, access to and from the dredge and support vessels for the Owner and the Engineer.

D. Weather

1. The project area is subject to windy and rainy weather, including severe electrical storms and other sudden and locally severe meteorological occurrences that approach hurricane conditions, during any time of the year. Contractor shall maintain full-time monitoring of the NOAA marine weather broadcasts, and avail themselves of such other local commercial weather forecasting services as may be available. It shall be Contractor's responsibility to obtain information concerning rain, wind, tide, and wave conditions that could influence his dredging and placement operations.

E. Noise Control

1. Contractor shall ensure that all possible measures are employed to reduce the amount of noise produced by his operations. Contractor shall conduct his operations to comply with all federal, state and local laws pertaining to noise. Additionally, Contractor shall inform all crewmembers of the need to maintain a professional manner while on the job sites, in radio communications, and in dealing with the public.

2. All hauling and excavating equipment including dredges, dredge/barges, booster pumps, tugs and other support vessels, dozers, loaders, etc. used on this Work shall be equipped with satisfactory mufflers and/or other noise abatement devices.

3. Contractor shall consider the proximity of the dredge operations to residential areas, especially during early evening, night, and early morning hours. Such consideration should include but not be limited to—reducing deck noise, reducing throttle, holding the use of horn and whistle signals to a minimum, and restraining the use of P.A. loudspeaker systems.

F. Light Control

1. Contractor shall ensure that all work lights (as opposed to safety lighting) are shielded to prevent them from shining on neighboring residential areas.

G. Damage to Property

1. Any damages to private or public property (inclusive of utilities) resulting from Contractor's operations shall be repaired and paid for by Contractor.

3.02 NOTIFICATION OF COAST GUARD

A. Commencement of Work

1. Prior to commencement of work on this contract, the Contractor will be required to notify the Commander, Eighth Coast Guard District of his intended operations to dredge and request that it be published in the local Notice to Mariners. This notification must be given

in sufficient time so that it appears in the Notice to Mariners at least 14 days prior to commencement of this dredging operation.

B. Navigation Aids

1. Navigation aids located within or near the areas required to be dredged shall be removed, if necessary, by the U.S. Coast Guard in advance of dredging operations. The Contractor shall not remove, change the location of, obstruct, willfully damage, make fast to, or interfere with any aid of navigation. The Contractor shall notify the Commander, Eighth Coast Guard District, New Orleans, Louisiana, in writing, with a copy to the Contracting Officer, 30 days in advance of the time he plans to dredge adjacent to any aids that require relocation to facilitate dredging. The Contractor shall contact the U.S. Coast Guard for information concerning the position to which the aids will be relocated.

C. Dredging Aids

1. The Contractor shall obtain approval from the U.S. Coast Guard for all buoys, dredging aid markers, and pipeline markers to be placed in the water, and dredging aid markers affixed with a light prior to the installation. Dredging aid markers and lights shall not be colored or placed in a manner that they will obstruct or be confused with navigation aids.

3.03 DREDGING AND SUPPORT OPERATIONS

A. All areas to be dredged shall be in accordance with the attached Project Drawings and shall not exceed the specific areas and depths indicated on those drawings. The Contractor is NOT authorized to dredge outside of the area depicted. Excavation shall be performed in a uniform and continuous manner so as to avoid creating multiple holes, valleys, or ridges.

B. The excavated material shall be transported to and placed in the designated fill areas as specified herein and shown on the Drawings. The Contractor shall dredge no deeper than the maximum elevation shown on the Drawings and allowed within these specifications. If the Contractor encounters unsuitable material during dredging operations, the Contractor shall identify the location where this material was encountered within the dredge area and shall note the location on the Contractor's Quality Control Report. If the Engineer determines the quality of beach fill is being adversely affected, that location shall be avoided.

C. No wetlands or submerged aquatic vegetation outside the project area is to be disturbed as a result of project construction. Failure to comply with this condition and all other permit conditions may result in enforcement action. All regulatory enforcement actions, stemming from the project construction, are the strict responsibility of the Contractor.

D. Bridge-To-Bridge Communication: In order that radio communication may be made with passing vessels, all dredges and support vessels engaged in Work under this Contract shall be equipped with bridge-to-bridge radio telephone equipment. The radio equipment shall operate on a single channel very high frequency (VHF) with low power output having a communication range of approximately ten (10) miles. The frequency shall be approved by the Federal Communication Commission (FCC). Channels #13 and #16 must be monitored at all times.

E. Turbidity

1. Excavation and filling operations shall be done in a manner that will minimize turbidity of the water at the excavation site and at the discharge location (fill area). If monitoring shows turbidity exceeds the background at the compliance stations by more than the levels specified in the State of Florida and Department of the Army permits, the Engineer shall be notified and construction activities shall cease immediately. Construction activities shall not

resume until corrective measures have been taken and turbidity has returned to acceptable levels. See SECTION 01 35 43 ENVIRONMENTAL PROTECTION.

F. Dredge Location Control

1. The Contractor shall continuously operate electronic positioning equipment on the dredge that will accurately compute and plot the dredge and dredge component's positions (e.g., cutter head location and elevation). The Contractor shall record continuous real time positioning of the dredge and cutter head, by plot or electronic means, during the entire dredging cycle. The contractor shall furnish such positions and the accompanying position plots, correlated to a 24-hour clock, upon request to the Engineer. A printout of the excavation device positions in state plane coordinates and the excavation device depths within 1-foot accuracy, corrected for tide elevation and referenced to NAVD and time shall be maintained using an interval of 2 minutes for each printed fix. Dredge location accuracy shall meet the requirements of the latest version of EM 1110-1-1003. The reports shall also include a printed and electronic computer file (in ascii format) copy of the position data. The contractor shall prepare a plot of the data that includes the state plane coordinate grid system and the authorized dredging limits and shall make this data available to the Engineer. Electronic positioning records (xyz data) shall also be made available upon request from regulatory agencies or the Engineer. No dredging shall take place outside the authorized dredging limits (horizontal and vertical) as shown on the project drawings. Prior to commencing work, the Contractor shall furnish specifications for this equipment, calibration information, and limits of accuracy. A written plan of the method the Contractor intends to use in order to satisfy these requirements shall be included with the Contractor's Quality Control Plan.

2. Data shall be furnished to the Engineer for each day's operation on a weekly basis. At the completion of the project, Contractor will provide a detailed drawing showing the dredging progress throughout the dredge area(s), ensuring that dredging did not occur outside the proposed area boundary or below the approved depths shown in the Drawings.

G. Right-of-Way Limits

1. Contractor shall conduct his operations to minimize interference with the movement of vessels in the adjacent waters not being actively dredged. However, for safety, the Contractor will be permitted to exclude the public from the work areas including in the immediate vicinity of active dredging or material placement operations. Enforcement shall be Contractor’s responsibility at no additional cost to the Owner. When appropriate, the enforcement shall be coordinated with local law enforcement agencies and the City of Destin, and will be subject to acceptance of the Owner and Engineer.

H. Access

1. The Contractor shall be responsible for providing and maintaining access necessary for his equipment and plant to and from the Work site. The Contractor shall ascertain the environmental conditions which can affect the access such as climate, winds, currents, waves, depths, shoaling, and scouring tendencies.

I. Protection of Existing Waterways

1. The Contractor shall conduct his operations in such a manner that material or other debris are not pushed outside of dredging limits or otherwise deposited in existing side channels, basins, docking areas, or other areas being utilized by vessels or with natural resources. The Contractor will be required to change his method of operations as may be required to comply with the above requirements. Should any bottom material or other debris be pushed into areas described above, as a result of the Contractor's operations, the same must be

promptly removed by and at the expense of the Contractor to the satisfaction of the Engineer.

2. Obstruction to Navigable Waterways

   a. Contractor shall promptly recover and remove any material, plant, machinery, or appliance Contractor loses, dumps, throws overboard, sinks, or misplaces, and which, in the opinion of Engineer, may be dangerous to or obstruct navigation. If required by the Engineer, Contractor will mark or buoy such obstructions; Engineer may have the obstructions removed by a separate Contract and deduct the cost from any monies due or becoming due to Contractor, or recover the cost under Contractor's bond. Contractor's Liability for the removal of a vessel, wrecked or sunk without fault of negligence is limited to that provided in sections 15, 19, and 29 of the River and Harbor Act of March 3, 1899 (33 U.S.C. 410 et seq.).

3. Solid Waste Disposal

   a. Contractor may encounter solid waste (tires, cans, bottles, fibrous plant material, boards and other debris) within the dredging template that cannot be dredged and/or hydraulically transported to the fill site. Contractor shall be responsible for the appropriate disposal of such material.

J. Dredging Adjacent to Property and Structures

1. This project may require dredging in the vicinity of existing piers, piles, bulkheads, and other structures and property. The contractor must take extra care to control the dredge in the vicinity of property and structures. Methods of securing the dredge may include but are not limited to dredge spuds and/or anchors. Any damage to private or public property and structures resulting from the contractor's dredging activities shall be repaired promptly at the contractor's expense. Any damage to structures because of the contractor's negligence will result in suspension of dredging and require prompt repair at the contractor's expense and subject to review and acceptance by the Engineer as a pre-requisite to the resumption of dredging.

K. Barge and Equipment Anchoring

1. If Contractor's operations require anchoring of barges or other equipment within the work areas, Contractor shall be responsible for assuring that the anchoring technique does not impact or interfere with navigation or damage public or private property or natural resources. If pilings are used for anchorage, the pilings shall be well marked and removed in their entirety upon completion of Contractor's operation. Contractor shall, at his own expense, repair any damages resulting from Contractor's operations. Anchoring or spudding of vessels and barges within wetland or submerged natural resource areas or damaging these areas is prohibited.

L. Subaqueous Cable Crossings

1. The Contractor shall be responsible for verifying the locations and depths of all utility crossings and take precautions against damages which might result from dredging operations, especially the sinking of dredge spuds and/or anchors into the channel bottom, in the vicinity of utility crossings. **The Contractor assumes all liability for submerged and buried utility facilities. If any utility damage occurs as a result of its operations, the Contractor shall suspend dredging in the area of the damaged utility until the damage is repaired and resumption of the dredging is accepted by the Engineer. The Owner shall not be responsible for the cost of such damage and repairs regardless of cause – including but not limited to any costs associated with interruption of utility services and delay damages.**

M. Booster Pumps

1. Any booster pumps installed by the Contractor — whether in-water or along the upland — shall be located at least 200 feet from any residential-type building or house. Booster pumps, their prime movers, and any auxiliary equipment shall be fitted or equipped with mufflers, noise control enclosures, or other engineering noise control methods, measures, and features such that steady noise emanating from this equipment does not exceed the local ordinances. Such items shall be maintained throughout the project duration. Location of booster pumps and noise control methods must be submitted to the Engineer for acceptance.

N. Deduction for Nonconforming Work

1. No excavation shall occur below the dredging depths or outside the dredging limits defined in the contract documents. This provision does not apply to the slopes of the navigation channel; that is, the Contractor will not be held responsible for sand running from outside the dredging areas when he is excavating at an edge of a dredging area. The Contractor shall maintain sufficient control to ensure active dredging does not extend beyond the approved dredging limits.

2. Beach and dune fill that is obtained from unauthorized areas will not be paid for under this contract. Excavation in such area(s) is a violation of State of Florida Permits for this work. If surveys determine that excavation has been performed outside the dredging limits or below the specified elevation within the dredging limits, the quantity of the material dredged from these areas will be computed and subtracted from the material pay quantity. Below the excavation depths shown on the Drawings, the dredging areas may contain material deposits that are undesirable for beach fill. In such case, the Contractor may be required to remove unsuitable material at no cost to the Owner. See paragraph "Allowable Overdepth" at the beginning of this section.

3.04 TRANSPORT OF DREDGED MATERIALS VIA PIPELINE

A. All excavated material shall be transported to the proposed beach fill area as shown on the Project Drawings and in accordance with the contract documents. If any material is deposited other than in places designated or approved, Contractor may be required to remove such misplaced material and redeposit it where directed at his expense. To the greatest extent possible, Contractor shall configure his activities (inclusive of pipelines) to allow continuous boat access to navigable waters. Contractor shall restrict access to these areas only as required to ensure public safety.

B. The method of material transport will be a Contractor decision; however, the proposed method will have to comply with all permit, production, and environmental requirements. Offshore dumping and rehandling of dredged material will not be allowed. If a dredging technique is used for this project that requires anchoring of barges within the Contractor's work area at the beach fill site (this includes the pipeline corridors), only barges using spud-type anchoring or anchoring to driven piles shall be allowed outside of the approved work areas, unless otherwise accepted by the Engineer.

C. Hydraulic Dredge Pipelines

1. A tight dredge discharge pipeline shall be maintained to prevent spilling of dredged material or dredge water outside of the disposal area. The pipeline joints shall all be constructed as to preclude spillage and leakage. The Contractor shall inspect pipeline to ensure that the entire pipeline route is devoid of any leaks before commencing and throughout dredging operations. The development of a leak shall be promptly repaired and the dredge shall be shut down until completed repairs have been made to the satisfaction of the Engineer.

Failure to immediately repair leaks in the pipeline will result in suspension of dredging operations and require prompt repair of pipeline as a prerequisite to the resumption of dredging. Any pipeline leak shall be immediately surveyed to determine the extent of the material spill. All spilled or misplaced materials will be recovered by the Contractor and any damage to private or public property or submerged resources resulting from the Contractor's operations shall be repaired by the Contractor at his expense.

2. The Contractor shall provide and maintain radio communication between the dredge and the placement areas at all times.

3. Pipeline Marking

   a. The Contractor shall plainly mark the pipeline access route (along the entire access) with conspicuous stakes, targets, buoys and/or lights (in accordance with required U.S. Coast Guard requirements) to be maintained throughout the Contract operations.

   b. Additionally, the Contractor shall clearly label the upland pipeline every 250 feet with signs reading as follows: “DANGER: HIGH PRESSURE DISCHARGE LINE.”

4. Submerged Pipeline

   a. In the event the Contractor elects to submerge his pipeline, the pipeline shall rest on the bottom, and the top of the submerged pipeline and any anchor securing the submerged pipeline shall be no higher than the project depth for any navigation channel in which the submerged pipeline is placed. Should Contractor elect to use a pipeline material that is buoyant or semi-buoyant, such as PVC pipe, HDPE pipe, or similar low-density materials, the Contractor shall securely anchor the pipeline to prevent pipeline from lifting off the bottom under any conditions. Contractor shall make daily inspections of the submerged pipeline to ensure buoyancy has not loosened the anchors. Contractor shall remove all anchors when the submerged pipeline is removed. The location of the entire length of submerged pipeline shall be marked with signs, buoys, lights, and flags conforming to U.S. Coast Guard regulations. If required by U.S. Coast Guard regulations, notification shall be given immediately so that it appears in the Notice to Mariners at least 14 days prior to the commencement of this operation. Under no circumstances shall the pipeline be anchored within any area identified with submerged natural resources.

5. Floating Pipeline

   Should the Contractor's pipeline not rest on the bottom, it will be considered a floating pipeline and shall be visible on the surface and clearly marked. In no case will the Contractor's pipeline be allowed to fluctuate between the surface and the bottom, or lie partly submerged. Lights shall be installed on the floating pipeline as required in paragraph SIGNAL LIGHTS above. The lights shall be supported either by buoys or by temporary piling, provided by the Contractor and approved by the Owner and required regulatory agencies. Where the pipeline does not cross a navigable channel, the flashing yellow all-around lights shall be spaced not over 200 feet apart, unless closer spacing is required by U.S. Coast Guard personnel, in which case the requirements of the U.S. Coast Guard shall govern, at no additional cost. If required by U.S. Coast Guard regulations, notification shall be given immediately so that it appears in the Notice to Mariners at least 14 days prior to the commencement of this operation.

3.05 BEACH FILL

A. General

1. All beach fill sand excavated from the navigation channels shall be transported to and deposited within the proposed Norriego Point beach and dune fill area within the lines, grades, and cross sections shown on the Drawings except as may be modified by the Engineer or provisions of subparagraph "Construction" below. In areas where proposed structures (to be constructed following beach fill placement) may prohibit constructing the full dune or beach berm template, the fill template may be modified as required by the Contractor such that an equal volume of sand is stockpiled adjacent to the proposed structure as accepted by the Engineer. The Engineer may alter plans based on field observations. Except as specified in subparagraph "Dressing for Payment" below, the Contractor shall maintain and protect the fill in a satisfactory condition at all times until acceptance of the work. Any fill sand which is lost in transit or permitted to flow into the adjacent offshore waters or navigation channels from the point the sand is discharged on the beach will not be subject to payment. The fill shall be free of clay lenses, rock or silt pockets. Any such material remaining in the fill shall be removed and disposed of by the Contractor as accepted by the Engineer. When acceptable to the Contractor's work plan, the Contractor shall provide sand ramp walkways across the beach pipeline at intervals not greater than 200 feet where the public may be allowed to traverse or utilize the restored beach areas.

B. Construction

1. Prior to placement of fill, the Contractor shall remove from the site of the work all snags, driftwood, and similar debris or material to be demolished lying within the foundation limits of the beach fill section, unless specified to remain within the Construction Drawings. All materials removed shall be disposed of in areas provided by and at the expense of the Contractor and accepted by the Engineer. Grading and other construction equipment will not be permitted outside the project boundary and staging area lines shown on the Drawings except for designated ingress and egress to and from the site.

2. When placing fill, the light composite FRP sheet piling sections are designed to withstand a soil height difference of approximately 4 feet. The heavy FRP sheet piling sections are designed to withstand a soil height difference of approximately 6 ft. The design assumes that soil, current and wave loads are not concurrent and that soil placement is such that it resists wave and current loads. The design for the heavy FRP sheet piling sections also assumes the rock stabilization structures are in-place to resist the wall loading associated with the upland fill. When placing fill material, heavy equipment should generally keep at least 20 feet away from all walls during soil backfilling, compaction or general construction operations to avoid excessive loading, wall deflections, or potential wall failure, unless soil elevations are matching on both sides. Any work performed within 20 feet of the walls shall be done with light equipment after the rock is placed. The Contractor shall shore and/or brace the sheet pile as needed to control deflections to specified sheet pile tolerances during placement of the dredged material.

3. The excavated material shall be placed and brought to rest on the beach to the lines, grades, and cross sections indicated on the Drawings, unless otherwise provided for herein or directed by the Engineer. The Contractor shall not stockpile pipe or any other equipment, materials or debris on private property. Construction pipes which are placed on the beach shall be placed parallel to the shoreline and as far inland as possible without compromising the dune system or existing natural areas according to permit conditions. The beach is subject to changes and the elevations on the beach at the time the work is done may vary from the elevations shown on the Drawings. The Engineer reserves the right to vary the width and grade of the berm and dune from the lines and grades shown on the plans in order to establish a uniform beach and/or natural-looking dune for the entire length of the

project. The fill and grading cross sections shown on the Drawings are for the purpose of estimating the theoretical amount of fill needed and will be used by the Engineer in making any change in the lines and grades. The Contractor will not be required to dress the fill below the mean high water to the slopes shown but will be required to do the dressing specified in subparagraph "Dressing for Payment" below.

4. The dredge pipeline and discharge shall be placed as far landward as possible. The dredge discharge shall be located a minimum of 200 feet from any existing or proposed structure, unless otherwise accepted by the Engineer. The dredge discharge shall not be directed directly toward any existing or proposed structure to avoid excessive loading on the structure or potential increased losses of material resulting from increased flow through or around the structure or structure scour.

5. The Contractor shall maintain a tight discharge pipeline for the pumpout operations at all times. The joints shall be so constructed as to preclude spillage and leakage. The pipeline corridors shall be visually inspected by the Contractor daily during periods of active pumpout operations for signs of slicks, plumes, boils, or other surface anomalies that would indicate leaks, seepage, ruptures, or failures. All occurrences shall be indicated in the Contractor's QCR. The development of a leak shall be promptly repaired or the pumpout operations shall be shut down until complete repair has been made to the satisfaction of the Engineer. The Contractor shall be required to maintain barricades, warning signals, and flagmen to insure public safety in the vicinity of the pipe discharge. Any damages to private or public property resulting from the Contractor's operations shall be repaired by the Contractor at his expense.

6. Grade stakes and any other stakes for any purpose shall be made of steel pipe that can and will be removed intact after filling to cross sections accepted by or as directed by the Engineer. All stakes shall have sufficient length above grade so they may not be accidentally covered by fill. The Contractor shall consecutively number each piece of pipe used for grade stakes, shall clearly mark that number upon the pipe, and shall record the location of each number pipe in a grade stake log. The removal of each numbered pipe shall be recorded in the grade stake log at the time of the pipe/stake removal. At the request of the Engineer, all of the grade stake pipes shall be displayed after their removal to demonstrate complete removal. It is the Contractor's responsibility to track, locate, and completely remove all grade stakes in their entirety to the satisfaction of the Engineer.

7. Temporary longitudinal dikes and spreader and pocket pipe shall be used to prevent gullying and erosion of the beach and fill and to retain the fill within the limits of the fill cross section. As the work progresses, dikes or mounds shall be constructed along the beach as necessary to direct the pipeline discharge longitudinally along the beach to avoid transverse gullying directly from the discharge point to the ocean, to build the new berm to design grade, to meet water quality standards, and to keep material within the construction toe-of-fill. More than one series of longitudinal dikes may be required to meet these requirements. When in operation, the opening of the discharge pipe shall be at least 200 feet behind the end of the dike where sand flows out onto the beach. The Contractor will not be held responsible for erosion caused by waves after the beach fill has been satisfactorily placed and accepted for payment except that the Contractor will be required to perform the dressing specified in subparagraph "Dressing for Final Acceptance" below. No undrained pockets shall be left in any fill during or upon completion of the work. The Contractor shall not permit wastewater to flow landward of the fill section or water to pond between the fill and upland. Groins, bulkheads, revetments, piers, dune walkovers, seawater pipe structures, and other structures within the fill section shall be protected by the Contractor to prevent damage thereof by the Contractor's operations. Any damages caused by the Contractor’s operations shall be fixed at the Contractor's expense.

8. Mechanical operations may be needed to place material to the required lines and grades. It is the Contractor's responsibility to place material to the specified lines and grades within

the fill cross section in accordance with the Contract Documents. In areas where structures prohibit tying the berm or dune to the existing grade, the fill template shall be modified or an equal volume of sand shall be stockpiled adjacent to the structure as required by the Engineer. The Engineer may alter plans based on field observations.

9. Any material that is rehandled or moved and placed in its final position by methods other than hydraulic shall be placed in horizontal layers not exceeding three (3) feet in thickness. Compaction of the layers will not be required, but the Contractor must saturate the sand as described in subparagraph “Sand Flooding” below. The Contractor shall schedule his operations to take advantage of the tide so that filling is done in the dry or as directed.

C. Sand Flooding

1. If the sand is placed in a state that is not completely saturated by hydraulic placement, the Contractor must saturate the dry placed sand to effect consolidation equal to hydraulic placement. No more than 100 cubic yards of sand at a time shall be placed on the beach without saturating. Enough water must be used to completely saturate the sand, not less than 100 gallons of water shall be available for each cubic yard of sand placement. Runoff water shall be controlled so as not to run off the project limits on the upland side and not to run directly to the inlet forming gullies and eroding the fill sand.

D. Dressing for Payment

1. Immediately following placement of the new beach fill the Contractor shall grade, level and dress the beach fill to meet the required elevations and dimensions indicated on the Drawings. The dressing for payment shall include the removal of humps, depressions, undrained pockets, and excavated material at locations of swales for drainage culverts, vehicle access ramps, etc. prior to final pay survey being taken of an area of Acceptance Section.

E. Dressing for Final Acceptance

1. Immediately upon the completion of beach fill placement and removal of equipment and materials from the beach and dune fill area, the final dressing shall be accomplished by the Contractor for final acceptance. This final dressing is a requirement as part of the post-construction cleanup.

F. Tolerances

1. A tolerance of five-tenths (0.5) of 1 foot below and five-tenths (0.5) of 1 foot above the prescribed berm grade and slopes, above the wave zone, will be permitted in the final surface, unless otherwise accepted by the Engineer. Any material placed above the prescribed tolerance may be left in place at the discretion of the Engineer; however, this material will not be included in the pay quantities.

G. Misplaced Materials

1. If any material is deposited other than in places designated or approved, the Contractor may be required to remove such misplaced material and redeposit it where directed at his expense.

H. Work Area

1. The work area and dredge area limits available to the Contractor for accomplishing the work are shown on the Drawings. The beach fill work area is any area of beach and/or dune fill shown on the Drawings less any setbacks required by these specifications, and the pipeline corridors. All beach fill work must be confined to the Contractors work area.

The Contractor shall exclude the public from the work area in the immediate vicinity of his dredging, transporting, disposal and grading operations. The Contractor shall prevent public access to the discharge end of his pipeline. The Contractor shall erect, maintain, and move as necessary, a restrictive barrier around the discharge of the hydraulic pipeline used for beach placement. The barrier shall be constructed so as to prevent the public from approaching the discharge from any direction closer than 100 feet. The Contractor shall post signs in a conspicuous manner stating "DANGER - HIGH PRESSURE DISCHARGE FROM DREDGE". Enforcement shall be the Contractor's responsibility at no additional cost to the Owner. The enforcement shall be coordinated with local enforcement agencies, and will be subject to acceptance of the Owner and Engineer. Additionally, the Contractor shall place a safety person at the discharge end of the disposal pipeline. The safety person shall be present at all times during discharge operations and will maintain radio communication between the dredge and the disposal operation.

I. Protection of Existing Waterways

1. The Contractor shall conduct his operations in such a manner that material or other debris is not pushed outside of dredging limits or otherwise deposited in existing channels, basins, docking areas, or other areas being utilized by vessels. The Contractor will be required to change his method of operations as may be required to comply with the above requirements. Should any bottom material or other debris be pushed into areas described above, as a result of the Contractor's operations, the same must be promptly removed by and at the expense of the Contractor to the satisfaction of the Engineer.

2. The Contractor shall place dredge spoil within the project area as shown in the construction drawings in such a manner to minimize the potential for any re-entry or re-entrainment back into the inlet or the federal navigation channels of East Pass or Destin Harbor. The Contractor may be required to remove any materials eroded from the project area and deposited within the federal navigation channels, resulting from unprotected erodible soils or improper construction scheduling or planning, at no cost to the Owner.

J. Vegetation Surrounding Beach and Dune Fill Area

1. The Contractor shall not damage the vegetation existing around the beach fill area (e.g., vegetation outside of the excavation or dune fill areas). Booster pumps, pipeline, and equipment shall not be placed or operated on vegetated areas.

K. Beach Access

1. The Contractor shall provide and maintain pedestrian access across the pipeline to the beach at 200-foot intervals where the public may be allowed to traverse or utilize the restored beach areas. At the Contractor's option, these accesses shall be provided either by constructing an earthen ramp over the pipeline or by burying the pipeline.

L. Wind Blown Sand

1. The Contractor shall take measures to control wind-blown sand. The Contractor is responsible for clean-up expenses that result from wind-blown sand.

3.06 NOISE CONTROL

A. Hauling and Excavating Equipment Other Than Dredges and Booster Pumps

All hauling and excavating equipment, other than dredges and booster pumps, used on this work shall be equipped with satisfactory mufflers or other noise abatement devices. The Contractor shall conduct his operations so as to comply with all Federal, State, and local laws pertaining to

noise. At the request of the Engineer or Owner, the Contractor shall perform sound pressure measurements with a sound level meter and report these measurements to the Engineer and Owner. Sound pressure measurements shall be made at distances of 50 feet, 100 feet, 300 feet, and 500 feet from each major piece of equipment such as draglines, dump trucks, bulldozers, etc., at locations approved by the Engineer. The measurements shall be made by personnel qualified to make such measurements and whose credentials have been verified by the Engineer and Owner. Temperature, atmospheric pressure, and general weather conditions shall also be recorded with the measurements.

B. Dredges, Bulk Carriers, and Booster Pumps

Dredges and booster pumps used on this work shall be equipped with satisfactory mufflers or other sound abatement devices to reduce engine noise. The Contractor shall conduct his operations so as to comply with all Federal, State, and local laws pertaining to noise. The use of horns, the use of whistle signals, and handling of dredge pipelines shall be held to the minimum necessary in order to insure as quiet an operation as possible. At the request of the Engineer or Owner, sound pressure measurements shall be made by the Contractor at 50-foot, 100-foot, 200-foot, and 300-foot distances from the (1) dredge, (2) booster pumps, if any, and (3) dredge pipeline at locations approved by the Engineer. The measurements shall be made by personnel qualified to make such measurements and whose credentials have been accepted by the Engineer or Owner. The sound pressure measurements and type of material being dredged at the time measurements are taken shall be reported to the Engineer. Temperature, atmospheric pressure and general weather conditions shall also be recorded with the measurements. The sound pressure measurements shall be reported to the Contracting Officer under provisions for the Contractor Quality Control.

3.07 QUALITY CONTROL

The Contractor shall establish and maintain quality control for operations under this section to assure compliance with contract requirements and maintain records of his quality control for materials, equipment, and construction operations, including but not limited to the following:

A. Preparatory Inspection

(To be conducted prior to commencing work.)

1. Check location of dredge area and conditions of beach areas to be filled.

2. Discuss plan of action for dredging, transporting, and placing fill on beach.

3. See that all equipment is approved and is in satisfactory working condition.

4. Check safety requirements and, particularly, public safety.

5. Check the beach site for structures that could be susceptible to damage or which could have further damage caused by the Contractor's activity.

B. Initial Inspections

(To be conducted after a representative sample of the work is complete.)

1. Check for proper lines, grades, and elevations.

2. See that diking and fill discharge is satisfactory.

3. Check grades and slopes of fill placement.

4. Check finished area for proper dressing and elimination of undrained pockets and abrupt humps.

5. Check any adjacent structures to search for damage by Contractor's equipment.

C. Follow-up Inspection

(To be conducted daily to assure compliance with results of initial inspection.)

1. Check items mentioned in preparatory and initial inspection.

2. Check for damage or defects.

3. A copy of these records, as well as results of corrective action taken, shall be furnished to the Owner as directed by the Engineer.

D. Project Area Surveys

1. Surveys of the fill area shall be taken by the Contractor once a week during construction. The purpose of these surveys is to insure that the fill material is not placed beyond the project limits and that the material is remaining within the area placed. Each profile shall be taken from the part of the beach that was constructed within the previous 7 days. The following items shall be labeled on each plot:

a. The elevation of the berm and dune referenced to NAVD88.

b. The slope of the construction profile as calculated from the profile itself.

c. A horizontal scale with zero at the baseline stationing on Contract Drawings.

d. Pre-construction and post-construction profile lines and dates of the surveys.

3.08 QUALITY CONTROL FOR BEACH PLACEMENT OF SAND

The permits for this project require only beach quality sand be placed on the beaches of Florida. The minimum quality beach sand is defined by the Department of Environmental Protection "Rules and Procedures for Application for Coastal Construction Permits" Chapter 62B-41.007(2) j and k, known as the "Sand Rule" at www.dep.state.fl.us. For placement of fill material, the Contractor shall comply with the Sediment Quality Control / Quality Assurance Plan appended to these specifications (included within Appendix B-1 – FDEP Permits for East Pass and Destin Harbor Dredging). If, for any reason, these specifications do not comply with the Sediment Quality Control / Quality Assurance Plan, the Plan shall govern. Quality control sampling will be required to establish compliance with the physical specifications provided. The Contractor shall perform sampling that includes no less sample collection than described in subparagraph "Sampling at the Placement Site" below. The Contractor shall include the sampling procedure in the Contractor's Quality Control Plan for Engineer review and acceptance. Each sample collected shall be approximately one pound in weight (minimum) and obtained from a single location representative of the dredged material within that area. All visually inspection results shall be recorded and reported to the Engineer daily in the Contractor’s Daily Report.

A. Grain Size Requirements

The Engineer shall perform post-construction quality assurance testing in the form of sieve analyses (to be conducted at the beach and dune placement sites) to verify that the material being used for beach and dune construction meets permit requirements for compatibility with the native beach material. The following constraints apply to all fill material used for construction.

1. Beach and dune fill shall not contain a fines content (material passing the #230 sieve) greater than 5% by weight.

2. Beach and dune fill material shall have a grain size range between 0.21 and 0.53 mm.

3. Beach and dune fill shall have a Moist Munsell Color value between 5Y 7/2, 2.5Y 7/2, or lighter.

4. Beach and dune fill shall not contain material greater than 19mm in diameter. Materials greater than 19mm include coarse gravel, cobbles, or rocks, as defined by the UCS.

5. Beach and dune fill shall not contain visual shell (carbonate) content greater than 5% by weight.

B. Construction Observation

The Contractor shall visually monitor the material being placed on the beach continuously to assess whether in fact the placed material meets the quality acceptance criteria (Table 1 of the Sand QAQC Plan). The Contractor shall report the findings, regardless of the sediment quality, in the required daily QC reports. The Contractor shall cease all dredging activities and immediately notify the Engineer upon observing any unacceptable material (Table 1). If occasional debris, trash, or rocks (d > ¾") appear on the beach during dredging operations, the Contractor shall remove them.

C. Sampling at the Placement Site

The Contractor shall collect sand samples at the discharge site to visually assess grain size, moist Munsell color, shell and silt content. Sand samples shall be collected at 100-foot intervals of newly constructed berm, immediately after placement. The samples shall be a minimum of 2 U.S. quarts. Contractor shall provide the samples to the Engineer as directed immediately upon collection of the sample. Each sample will be labeled with the date, time and location of the sample. The plan of sampling shall be submitted with the Contractor's Quality Control Plan. The Contractor's Daily Report shall reference the collection of the required samples and document the occurrence of rock, rubble, shell, silt or debris in the discharge area that exceeds acceptable limits.

D. Color Requirements

The dredged sand color shall be similar to the existing beach. Based on the Munsell Soil Color Chart, the dredged sand color shall meet the following allowable moist Munsell Color of 5Y 7/2, 2.5Y 7/2, or lighter. The Engineer will conduct color tests to verify that the dredged sand color meets the above color requirements; however, the Contractor shall also continually monitor the discharge site to visually assess color requirements. The color tests shall use moist samples of the dredged material.

E. Testing Methods and Frequency

Methods and materials used for testing shall conform to applicable sections of ASTM D422-63 and ASTM D2487. All test samples shall be representative of the material being transferred and placed on the beach and dune sites. The Engineer may require additional testing as deemed necessary. The Contractor shall provide the sand samples to the Engineer for testing as required above and by the Sediment Quality Control / Quality Assurance Plan. In addition, testing and sampling shall be conducted at any time when the visual attributes (coloration, grain texture, etc.) of the incoming material indicate possible changes in material quality.

F. Failing Tests or Unacceptable Material

As the beach construction progresses, should any beach sample FAIL the specifications of the Sediment Quality Control / Quality Assurance Plan, the Contractor shall immediately cease material excavation operations and take whatever actions necessary to avoid further discharge of unsuitable material. This may include repositioning the dredge or, if necessary, relocating the dredge to another portion of the dredge area where suitable material exists. Additional tests shall be taken to define the area containing substandard material.

Upon resumption of transfer operations, all unsuitable material placed on the beach shall be removed or blended according to methods and procedures specified in the Sediment Quality Control / Quality Assurance Plan.

G. Excessive Quantities of Shell

If at any time during pumping operations excessive quantities of shell are observed in the incoming fill, the Contractor shall cease excavating material from the area containing the excessive shell material and relocate the cutter head and/or dredge to a portion of the navigation channel where suitable material exists. Excessive shell content shall be defined as material containing 5% or more shell, as determined by visual observation.

Upon resumption of transfer operations, suitable material shall be placed in the area of substandard material and blended by raking or other means to reduce the substandard material to an acceptable level.

3.09 INSPECTIONS

A. Quality Assurance Representative (QAR)

The QAR and/or Engineer shall be notified prior to the establishment of horizontal control work (baseline layout, ranges, station flags, shore-based control for EPS/RPS, etc.) and vertical control work (tide staff(s), upland cross sections, construction elevations top/invert, maximum/minimum elevations of dredged materials within disposal area(s), etc.), but the presence or absence of the QAR or Engineer shall not relieve the Contractor of his responsibility for proper execution of the work in accordance with the specifications. The Contractor will be required:

1. To furnish, on the request of the Engineer or any QAR, the use of such boats, boatmen, laborers, and material forming a part of the ordinary and usual equipment and crew of the dredging plant as may be reasonably necessary in inspecting and supervising the work.

2. To furnish, on the request of the Engineer or any QAR, suitable transportation from all points on shore designated by the Engineer to and from the various pieces of plant, and to and from the beach placement.

B. Failure to Comply

Should the Contractor refuse, neglect, or delay compliance with these requirements, the specific facilities may be furnished and maintained by the Engineer and the cost thereof will be deducted from any amounts due or to become due the Contractor.

C. CONSTRUCTION FORMS AND DETAILS

Construction forms and details utilized by the Contractor shall be obtained from the construction forms and details provided by the U.S. Army Corps of Engineers provided at the following web address:

http://www.saj.usace.army.mil/About/DivisionsOffices/Engineering/DesignBranch/SpecificationsSection.aspx or similar. Forms shall be submitted to the Engineer a minimum of 14 days prior to construction for review and acceptance.

3.10 SURVEYS

A. General Requirements for Dredging Surveys and Upland Survey Submittals

1. All surveys for submittal shall be conducted by an Engineer-accepted surveyor(s) licensed in the State of Florida (See SECTION 01 45 16 – CONTRACTOR QUALITY CONTROL).

2. All surveys shall reference the horizontal and vertical control datum used in the Project Drawings.

3. All bathymetric surveys shall be performed by equivalent methods, standards, and data density to the pre-construction dredging survey.

B. Dredging Survey Submittals

1. For each dredging survey, submit two (2) original signed and sealed hard copies of the survey on full-sized (22” x 34” or 11” x 17”) paper showing the following:

   a. Plan view of the dredging area with bathymetric contour lines

   b. Cross sections of the pre-dredge surface, proposed dredge surface, and actual surveyed surface at the same locations as shown in the Project Drawings

   c. Estimate of volume of material dredged within the Required Depth and Side Slopes (for Payment)

   d. Estimate of volume of material dredged beyond the Required Depth and Side Slopes (Not for Payment)

   e. Estimate of remaining material to be dredged within the Required Depth and Side Slopes

2. For each survey, submit one (1) CD or DVD of the survey in PDF form, and in AutoCAD format (2013 or later). CD or DVD submittal shall contain the original xyz survey data file, an XML file of the digital surface used to create bathymetric contours, cross sections, volume comparisons, and survey report (including survey dates, tide corrections, survey control, etc.). If the surveyor used any clipping boundaries, those shall be provided in the XML file.

3. For Progress Payment Surveys the Contractor need not re-survey sections that were previously accepted as complete.

C. Pre-Construction Bathymetric Survey

1. Gustin, Cothern, and Tucker, Inc., completed a bathymetric survey of the project area, dated January 2016 (Appendix C). The contours shown on the Project Drawings represent the bathymetric conditions existing at the time of the survey. The Contractor will be provided with the digital survey data upon request.

D. Pre-Dredge Bathymetric Survey

1. At the time of construction, actual conditions at the project sites may vary significantly. Since the Contractor will be paid for quantity of material removed from the project area, the Contractor shall perform a new pre-construction bathymetric survey of the project area. When accepted by the Engineer, this survey will be used as the pre-dredging survey for payment quantity calculations.

E. Post-Dredge Bathymetric Survey

1. Within 7 days of the completion of construction activities within an acceptance section, or within a timeframe accepted by the Engineer, the Contractor shall perform the post-construction bathymetric survey. Upon submittal to the Engineer, the surveys shall be reviewed for accuracy, completeness, and to calculate payment quantities relative to the pre-dredge survey or to previously received progress payment surveys.

2. At project completion, the Contractor shall submit five (5) copies of a signed and sealed survey of the entire project within fifteen (15) calendar days of the completion of dredging activities for Engineer review and acceptance. The Contractor need not re-survey sections that were previously accepted as complete. At a minimum, the project certification survey must include the pre-dredge bathymetric survey, permitted/design dredging template, and post-dredge bathymetric survey (combining each of the acceptance sections). The payment quantities within the permitted/design shall be shown on the front cover (summarizing each Acceptance Section) and be sealed by a Florida licensed surveyor as part of the submittal. The survey shall also clearly indicate the date of dredging and surveying within each of the Acceptance Sections.

F. Upland As-Built Survey Submittal

1. Final grades and elevations shall be to the lines and elevations shown on the Project Drawings within the finish grading and tolerances sections of these specifications. At the end of the project, but before substantial completion, the Contractor shall perform an as-built survey of the final grades and elevations. At minimum, the survey shall include a plan view of the fill area topographic contour lines and cross sections of the pre-construction surface, proposed fill surface, and actual (post-construction) surveyed surface at the same locations as shown in the Project Drawings. The survey shall also include the property lines, limits of existing vegetation and the mean high water line (MHWL). Surveyors shall collect additional survey data as necessary between profiles lines to accurately define the post-construction conditions and varying topography along the dune, embayments, and MHWL. The survey shall be signed and sealed by a professional surveyor licensed in the state of Florida. The Contractor shall submit the final as-built survey to the Engineer for review and acceptance. The submittal shall include one (1) CD or DVD of the survey in PDF form, and in AutoCAD format (2013 or later). CD or DVD submittal shall contain the original xyz survey data file, an XML file of the digital surface used to create bathymetric contours, cross sections, volume comparisons, and survey report (including survey dates, tide corrections, survey control, etc.). If the surveyor used any clipping boundaries, those shall be provided in the XML file. See Section 01 77 00 Project Closeout for any additional requirements of the upland As-Built Survey.

3.11 FINAL EXAMINATION AND ACCEPTANCE

A. Final Examination of Work

1. As soon as practicable and no later than one (1) week after receipt of the post-construction bathymetric or as-built surveys, the Engineer will review the surveys and/or examine the Work sites. Methods of examination may include but are not limited to review of survey data, requests that the Contractor's surveyor conduct additional survey soundings or sweeping at no additional cost to the Owner, and Owner conduct an independent survey.

Should any lumps or other lack of depth in excess of the channel Design Depths be disclosed by these examinations, the Contractor will be required to remove these materials by dredging. Contractor or his authorized representative will be notified when the examination is to be made and will be permitted to accompany the survey party. When the area is found to be in a satisfactory condition, it will be accepted.

2. The Owner reserves the right to conduct an independent survey. Any discrepancies between the Contractor and Owner surveys will be in favor of the Owner.

3. Should more than two examinations by Engineer over an area be necessary by reason of work for the removal of lack of depth disclosed at a prior examination, the cost of such third and any subsequent Owner conduct of independent survey will be charged against Contractor at the rate of $5,000 per day for each day in which the examination survey crew is engaged in sounding and/or is en route to or from the site or held at or near the site for such operation.

B. Final Acceptance

1. Final acceptance of the whole or a part of the work and the deductions or corrections of deductions made thereon will not be reopened after having once been made, except on evidence of collusion, fraud or obvious error, and the acceptance of a completed section shall not change the time of payment of the retained percentages of the whole or any part of the work.

3.12 FINAL CLEANUP

A. Final cleanup shall include the removal of all Contractor's plant, equipment, and materials for either disposal or reuse. All such disposal shall be in a manner and at locations accepted by the Owner and Engineer. Contractor shall not be permitted to abandon equipment or materials in any area within or adjacent to the project sites, including the offshore dredge or upland disposal areas.

-END OF SECTION-

SECTION 35 31 17

STONE PLACEMENT FOR SHORELINE STABILIZATION

PART 1 GENERAL

1.01 SUMMARY

A. The Work covered by this section consists of furnishing all labor, materials, and equipment in connection with construction and installation of the polymeric marine mattress and stone features as described in the Project Drawings.

1.02 REFERENCES

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

A. American Association of State Highway and Transportation Officials (AASHTO)

AASHTO T104	Standard Method of Test for Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
AASHTO T85	Specific Gravity of Coarse Aggregate
	Standard Specification for Highway Brides (1997 Interim)

B. U.S. Army Corps of Engineers (USACE)

EM 1110-2-1100	The Coastal Engineering Manual
EM 1110-2-2302	Construction with Large Stone

C. American Society for Testing and Materials

ASTM C88	Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C127	Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate
ASTM C535	Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM D1556	Test for Density of Soil and Soil Aggregates in Place by the Sand Cone Method
ASTM D2922	Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D698	Laboratory Compaction Characteristics of Soil Using Standard Effort
ASTM D4643	Standard Test Method for Determination of Water (Moisture) Content of Soil by the Microwave Oven Method
ASTM D2487	Classification of Soils for Engineering Purposes
ASTM D422	Standard Test Method for Amount of Material in Soils Finer than the No. 200 Sieve
ASTM D1388	Flexural Rigidity (Option A)
ASTM D4355	Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)
ASTM D4759	Standard Practice for Determining the Specification Conformance of Geosynthetics
ASTM D 5732-95	Standard Test Method for Stiffness of Fabrics

ASTM D5818	Practice for Obtaining Samples of Geosynthetics from a Test Section for Assessment of Installation Damage
ASTM D6473	Specific Gravity and Absorption of Rock for Erosion Control

D. U.S. Environmental Protection Agency (EPA)

EPA9090	Compatibility Test for Wastes and Membrane Liners

E. Florida Department of Transportation (FDOT)
Roadway and Traffic Design Standards, 2008 edition
Standard Specifications for Roadway and Bridge Construction, 2007 edition

F. Geosynthetic Institute
GG1-87 Standard Test Method for Geogrid Rib Tensile Strength
GG2-87 Standard Test Method for Geogrid Junction Strength

1.03 DEFINITIONS

A. Polymeric Marine Mattress - A non-metallic compartmental structure filled tightly with stone prior to installation. Filling is achieved while each unit is positioned on edge prior to installation. Units are comprised of structural geogrid, braid, and mechanical connection elements fabricated to allow placement and provide containment of aggregate foundation materials.

B. Geogrid – An integrally formed grid structure manufactured of a stress resistant high density polyethylene (HDPE) and / or polypropylene (PP) material with molecular weight and molecular characteristics which impart high resistance to:

1. Loss of load capacity or structural integrity when the geogrid is subjected to mechanical stress in installation

2. Deformation when the geogrid is subjected to applied force in use

3. Loss of load capacity or structural integrity when the geogrid is subjected to long-term environmental stress.

C. Minimum Average Roll Value – Value based on testing and determined in accordance with ASTM D 4759.

D. True Tensile Modulus in Use – The ratio of tensile strength to corresponding strain (e.g. 1%). The tensile strength is measured via GRI GG1 as modified by AASHTO Standard Specification for Highway Bridges, 1997 Interim, using a single rib having the greater of 3 junctions or 8 inches and tested at a strain rate of 10 percent per minute based on this gauge length without deforming test materials under load before measuring such resistance or employing “secant” or “offset” tangent methods of measurement so as to overstate tensile properties. Values shown are minimum average roll values.

E. Junction Strength – Breaking tensile strength of junctions when tested in accordance with GRI GG2 as modified by AASHTO Standard Specification for Highway Bridges, 1997 Interim, using a single rib having the greater of 3 junctions or 8 inches and tested at a strain rate of 10 percent per minute based on this gauge length. Values shown are minimum average roll values.

F. Flexural Stiffness (also known as Flexural Rigidity) - Resistance to bending force measured via ASTM D 5732-95 using specimens of width two ribs wide, with transverse ribs cut flush with exterior edges of longitudinal ribs (as a “ladder”), and of length sufficiently long to enable measurement of the overhang dimension. The overall Flexural Rigidity is calculated as the

square root of the product of machine- and cross-machine-direction Flexural Rigidity values. Values shown are minimum average roll values.

G. Resistance to Installation Damage – Resistance to loss of load capacity or structural integrity when subjected to mechanical stress in installation measured via ASTM D 5818 in a crushed stone classified as a poorly graded gravel with a maximum 2 inch particle size (GP). Values shown are typical values.

H. Resistance to Long Term Degradation – Resistance to loss of load capacity or structural integrity when subjected to chemically aggressive environments measured via EPA 9090 immersion testing. Values shown are typical values.

I. Ultraviolet Stability – The ratio of tensile strength after exposure to the tensile strength prior to exposure, with exposure per ASTM D 4355 and tensile strengths measured via GRI GG1 as discussed above for "True Tensile Modulus in Use."

J. Incomplete Sections – Sections of the T-Groin breakwater structure where the marine mattress, toe protection stone, core stone, or armor stone on both the seaward side and landward side (where applicable) have not been placed to their final configuration. These incomplete sections also include sections of the breakwaters where all the stone has been placed to its final configuration on both sides of the breakwaters within 25 feet horizontally (as measured by station or along the structure crest) of areas in which all the stone has not been placed. Head sections shall not be considered complete until fully completed up to the transition on both the landside and seaward side of the breakwaters.

1.04 ORDER OF WORK

A. The Contractor shall follow the proposed order of work unless an alternative plan has been reviewed and accepted by the Engineer. The Contractor shall properly sequence marine mattress and stone placement with sheet pile wall installation to ensure an efficient construction operation that maintains the proposed schedule, minimizes repeated work, ensures work components do not conflict, and does not result in material damage or anticipated design conditions exceedances.

1.05 PHYSICAL DATA

A. Physical Conditions: The indications of physical conditions on the drawings and in the specifications are the result of site investigations by the referenced surveys or data. The site is subject to tidal currents, wave action from East Pass, storm surge, boat wake and winds. The physical conditions at the site are dynamic and may vary from the physical conditions shown in the project drawings. The Contractor shall perform a site visit to review and investigate existing site conditions prior to project bidding and construction. The conditions at the time of the bid and construction commencement may differ.

B. Maritime Traffic: Maritime Traffic in the project area generally consists of small to mid-size (approx. 40ft – 60ft) recreation and commercial vessels of all types and sizes.

1.06 SUBMITTALS

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

A. Stone Product Data: The Contractor shall submit a certified report detailing the properties of the various stone materials proposed for construction. The report shall demonstrate the stone meets

all the requirements of the Specifications prior to ordering material. The report shall include a description of the source materials, quarry location, and material properties. The certified report shall detail the armor stone, core stone, and marine mattress fill material type, gradation, and material quality testing results from a qualified independent testing laboratory selected and compensated by the Contractor. In addition, the report shall include letters of certification for all types of stone stating that the stone meets the gradation and material property requirements of the Specifications. The Contractor shall also provide a letter from the selected marine mattress manufacturer that the proposed bedding/fill stone gradation is appropriate for the marine mattress filling. The Contractor shall provide the submittal a minimum of fourteen (14) days prior to the planned date for ordering the stone. The Contractor may not use more than one quarry without prior acceptance of the Engineer. The Engineer will require additional tests, at no cost to the Owner, if additional quarries are requested.

B. Geotextile Underlayment (Filter Fabric) Product Data: The Contractor shall submit manufacturer's information and certification that the proposed geotextile underlayment or filter fabric material meets these specifications prior to ordering. Contractor's submittal shall also include a minimum 6" x 6" physical sample of the geotextile underlayment material. The Contractor shall provide the submittal a minimum of fourteen (14) days prior to the planned date for ordering the geotextile material.

C. Stone Placement Plan: The Contractor shall submit to the Owner and Engineer a written stone placement plan. The plan shall identify staging areas where stone will be offloaded, staged and stored, transportation methodology, and scheduling. The plan shall describe the measures and controls to properly excavate to the required elevations; methods to construct, fill, and install the marine mattress units with attached underlayment; measures to protect the mattress and underlayment units from damage during placement operations; method(s) and sequence of stone placement; and equipment to be used during each phase of placement. The plan shall also describe verification measures to ensure the techniques will allow for suitable control of stone location, slopes, and proper interlock with the underlying or adjacent stones to resist displacement by wave and current action and to form a uniform and compact section. In addition, on the day construction commences, the Contractor shall provide an on-site demonstration to verify that the placement technique is satisfactory.

D. Marine Mattress Geogrid Material and Shop Drawings: The Contractor shall provide a sample of the geogrid, braid, and mechanical connection elements material along with the product data sheets to the Engineer for acceptance. Submit the overall mattress layout/plan, typical sections, connections, details, and customized shapes in shop drawings. Submit geogrid product data sheet and certification from the manufacturer that the geogrid product supplied meets the requirements of this Section. Submit manufacturer's general recommendations and instructions for acceptable filling material size and gradation, fabrication, filling, installation, and repair. The Contractor shall provide the submittals a minimum of twenty (20) days prior to ordering the materials.

E. Alternate Marine Mattress Geogrid Material and Shop Drawings (if required): In order to be considered, submittal packages for alternate geogrid materials must include:

1. A list of 10 comparable projects in terms of size and applications, in the United States, where the results of a specific alternate geogrid material can be verified after a minimum of three years of service life

2. A sample of the alternate material and certified specification sheets

3. Shop Drawings showing mattress plan and section views, connections, details and customizable shapes

4. Recommended fabrication and installation instructions

5. Additional information as required by the Engineer

F. Armor Stone Weight Test: The Contractor shall perform weight tests of the armor stone in the presence of the Engineer or Owner. If the Engineer or Owner are not available, the Contractor may provide certified test results from a certified geotechnical laboratory to the Engineer that the stone shipped complies with these specifications.

For the weight test, the test sample shall be representative of the stone being shipped (minimum 10 stone samples for each test) and shall be performed three (3) times for the armor stones at: 1) when the first shipment of stone is being loaded and before delivery of that stone to the site; 2) when approximately 50% of the armor stone has been loaded; and, 3) near the completion of the project when approximately 75 – 80% of the armor stone has been loaded. Each weighted stone shall be clearly marked with its weight. The Contractor shall provide a minimum of 5 representative stones with marked weights at a convenient location at the quarry site and at the project site (or staging area) where the Contractor and Engineer can compare selected armor stones. The Engineer may require the Contractor to perform additional stone weight tests should stone not appearing to meet the requirements of these weight specifications be delivered to the site.

A test sample shall entail measurement and notation of: the net weight of the total sample, the weight of each stone in the sample, and average dimensions (from three spatial dimensions) of each stone in the sample. The Contractor shall provide a report for each test including:

1. Date of the test

2. The samples net weight

3. Total number of stones for each test

4. The average three spatial dimensions measured for each stone in the sample

5. The weight of each stone

6. The certified laboratory report verifying the unit weight, specific gravity, absorption, Los Angeles Abrasion and Soundness (see GENERAL STONE SPECIFICATIONS below).

Failure of the tests on two subsequent samples will be cause for rejection of the quarry and/or quarrying process. The contractor shall not install stone that fails to meet the parameters of these specifications. Any additional tests required due to failure of the test samples will be made at no cost to the Owner.

G. (As Necessary) Restoration Plan: At the request of the Engineer, the Contractor shall submit a plan to address all identified site restoration requirements. The plan shall provide written and/or graphic representation of the Contractors proposed site restoration activities. The restoration plan will also include a schedule for completion of the restoration work. The Contactor shall provide the restoration plan to the Engineer within 10 days of receiving a request from the Engineer. The Contractor will address any comments or requests made by the Engineer and commence restoration work immediately upon receipt of submittal acceptance.

H. Certified Rock Quantity: The Contractor shall provide records of the net weight of rock transported to the project site. The Contractor shall provide the Engineer with a weekly cumulative total of all rock delivered to the project site and a total of all rock placed by weight. The rock weight records shall be broken down and classified by size (e.g., Armor Stone, Core Stone, and Bedding/Fill Stone). The weight records shall be supported by signed weight tickets and any other supporting records as required by the Engineer.

I. As-Built Survey: Upon completion of a structure(s), the Contractor shall provide as-built surveys of all constructed structure(s) and features and prepare a certified survey drawing. A Professional Land Surveyor licensed in the state of Florida and experienced in topographic and bathymetric survey work shall prepare the survey. The survey drawing shall be referenced to State Plane Florida North, NAD 1983 (Horizontal) and North American Vertical Datum (NAVD) 1988 (Vertical).

Where excavation is required to meet the desired grades, the base elevations, toe of the structure, and constructed grades shall all be surveyed prior to backfilling, final stone placement, or site restoration. This survey is required for payment of the structure(s) in the submitted progress payment. In addition, a final certified as-built survey is required as a condition for final payment that will include all structures and features associated with the project.

The surveyor will collect data in sections a maximum spacing of 25 feet along the centerline axis of the constructed structures. The surveys shall extend a minimum of 25 ft beyond the farthest edge of construction on all sides of the structures (seaward, landward and alongshore). Point elevations along each section line shall be collected at all grade changes and between grade changes at spacing no greater than 5 ft. The Contractor shall provide the certified as-built survey drawing and field notes to the Engineer within seven (7) calendar days of conducting the field survey. The Engineer shall review the survey and identify as-built deficiencies or accept the submittal within five (5) working days of receiving the survey. The final as-built survey of the structures and all project components must be submitted and accepted prior to final payment and authorization to demobilize from the site. The submittal shall include both digital and hard copies.

PART 2 PRODUCTS

2.01 GENERAL STONE SPECIFICATIONS

A. All stone shall be a hard, durable natural stone such that it will not disintegrate under the elements and it will not break during handling. Stone shall be of a suitable quality to ensure permanence in the structure and in the climate in which it is to be used. It shall be free from cracks, blast fractures, bedding, drilling holes, seams and other defects that would tend to increase its deterioration from natural cases. The stone shall be clean and reasonably free from soil, dust, quarry fines, and shall contain no refuse.

B. All armor and marine mattress fill/bedding stone, shall meet or exceed the following physical characteristics:

1. Unit Weight (ASTM C 127) = 165 lb/cf (minimum)

2. Specific Gravity = 2.6 (minimum)

3. Absorption (ASTMC 127) = Maximum 5%

4. Los Angeles Abrasion (ASTM C131) = Maximum Loss 40%

5. Soundness (AASHTO T104) = Maximum Loss 12%

C. All core stone shall meet or exceed the following physical characteristics and general requirements of FDOT Standard Specifications for Road and Bridge Construction – Section 530-2.2.1 Rubble and 530-2.2.3 Physical Requirements:

1. Unit Weight (ASTM C 127) = 154 lb/cf (minimum)

2. Specific Gravity = 2.4 (minimum)

3. Absorption (ASTMC 127) = Maximum 5%

4. Los Angeles Abrasion (ASTM C131) = Maximum Loss 45%

5. Soundness (AASHTO T104) = Maximum Loss 12% (after 5 cycles)

D. The Contractor shall obtain the services of an independent testing laboratory to perform any required tests. The Contractor shall submit the qualifications of the independent testing laboratory to the Engineer for acceptance.

E. The faces of individual pieces of stone shall be roughly angular, not rounded, in shape.

F. The Engineer reserves the right to refuse payment for stone delivered to the site that does not meet these specifications. The Contractor shall remove any unacceptable stone from the work site at no additional cost to the Owner. Unacceptable stone shall not be utilized for construction unless specifically authorized by the Engineer.

G. The Engineer may require the Contractor to perform additional testing for stone delivered to the site that does not appear to meet these specifications. Additional testing may include physical properties testing, weight testing, drop testing, or any other tests deemed necessary by the Engineer to ensure compliance with these specifications.

2.02 MARINE MATTRESS

A. Manufacturers:

1. Tensar International Corporation
Contact: Jeff Fiske, Coastal and Waterway Industry Manager
2500 Northwinds Pkwy, Suite 500
Alpharetta, Georgia 30009
Phone: (770) 344-2123
Mobile: (678) 576-6123
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B. The Contractor shall install a polymeric marine mattress system with structural geogrid, braid, mechanical connection elements and stone fill. The mattress geogrid system will comprise the structure foundation and fully enclose the bedding stone layer. The foundation marine mattress system shall comprise of Tensar International Corporation Triton UX Marine Mattress, Maccaferri Polymeric Marine Mattress, or Engineer accepted equal. The marine mattress system shall include a geotextile fabric underlayer and biaxial geogrid extension to ensure sufficient overlap beneath adjacent units as indicated on the project drawings and within these specifications. The marine mattress segments as fabricated shall have minimum dimensions of 5 feet wide by 20 feet long by 1 foot thick, or as accepted by the Engineer. The Contractor shall consult the manufacturer for specific recommendations regarding maximum length dimension to avoid failure or excessive loads during lifting and handling operations.

C. Work consists of:

1. Furnishing geogrids, braid, mechanical connection elements, and stone fill materials as specified herein and shown on the project drawings. Geogrid material shall include sufficient quantities to form lifting hoops for the units.

2. Fabricating, filling and placing the polymeric marine mattress units in accordance with this Section, manufacturer's requirements, and in conformity with the lines, grades, and dimensions shown on the project drawings or established by the Engineer. Some pre-fabrication of the units may be accomplished prior to delivery to the site.

D. Alternates:

1. For alternates, see Paragraph 1.06, above.

2. Metallic materials will not be considered as an alternate to polymeric materials for the Polymeric Marine Mattress system.

3. Alternate geogrid materials shall not be considered unless submitted to the Engineer and accepted in writing by the Engineer at least 7 days prior to the final bid submittal date. The Engineer shall have absolute authority to reject or accept alternate materials based on his interpretation of the requirements of this Section and the Engineer's judgment and experience. Certain material properties of the structural geogrid are critical to the fabrication, lifting and placement, and serviceability of this application. The structural geogrid must satisfy the requirements of this Section, regardless of any previous acceptance of the proposed geogrid by the Owner or Engineer for other types of applications. Coated geogrids and geogrids composed of small diameter filaments shall not be allowed for constructing Polymeric Marine Mattress units.

E. Structural Geogrid

1. Unless otherwise called out on the Drawings, the structural geogrid type shall be Type 1 for the internal diaphragms of the units and Type 2 for the top, bottom and sides of the units.

2. The structural geogrid shall be produced from virgin resin and classified as high density polyethylene (HDPE) and / or polypropylene (PP) and shall possess complete continuity of all properties throughout its structure.

3. The structural geogrid shall accept applied force in use by positive mechanical interlock (i.e. direct mechanical keying) with: compacted soil or construction fill materials; contiguous sections of itself when overlapped and embedded in compacted soil or construction fill materials; and, rigid mechanical connection elements such as bodkins, pins or hooks.

4. The structural geogrid shall have the following characteristics:

PROPERTY	UNITS	TYPE 1	TYPE 2
True 1% Tensile Modulus in Use (MD)	kN/m (lb/ft)	750 (51,400)	1,650 (113,090)
Junction Strength (MD)	kN/m (lb/ft)	48.60 (3,330)	100.8 (6,908)
Flexural Stiffness	mg-cm	670,000	6,600,000
Resistance to Installation Damage	%GP	85	85
Resistance to Long Term Degradation	%	100	100
Ultraviolet Stability (Retained Strength @ 500 hours)	%	100	100

F. Mechanical Connection Elements

1. The mechanical connection elements shall be composed of HDPE and/or PP, unless otherwise accepted by the Engineer and Manufacturer.

2. The mechanical connection used shall be bodkin type, unless otherwise accepted by the Engineer and Manufacturer.

G. UV Stabilized Braid

1. The braid used for tying and lacing in the fabrication of the units shall be 8-strand hollow-core braid composed of HDPE. Each strand shall consist of a bundle of monofilament HDPE.

2. The braid shall have a nominal diameter of not less than 3/16 inch and a breaking strength of not less than 400 lbs on a test specimen 36 inches in length

3. The braid shall be UV stabilized with a minimum carbon black content of 2.0% by weight.

H. Stone Fill Materials: see BEDDING STONE Section below

I. Custom Mattresses: Custom mattress shapes are required along the northernmost structures due to the curvature of the structure within this area. The Contractor shall consult with the marine mattress supplier regarding these custom shapes and shall submit shop drawings of these custom shapes to the Engineer for review and acceptance prior to material ordering. Gaps internal to the northern curved structure (Northern T-Groin #4, Transition, and Terminus) less than 2 feet in width shall not require a marine mattress; however, the geogrid overlap and geotextile underlayment requirements must still be met.

J. Delivery, Storage, and Handling: The Contractor shall:

1. Prevent excessive mud, wet concrete, epoxy, or other deleterious materials from coming in contact with and affixing to mattress materials.

2. Store at temperatures above –20 degrees F (-29 degrees C).

3. Rolled materials may be laid flat or stood on end.

2.03 GEOTEXTILE UNDERLAYMENT

A. Geotextile underlayment (or filter fabric) shall be attached to the bottom of the marine mattress system as shown in the Project Drawings and in accordance with mattress manufacturer's specifications. The filter fabric shall be a U.S. Fabrics US 670 woven filter fabric or Engineer accepted equivalent. The fabric shall also be attached to the biaxial geogrid extending 2' beyond the edge of the mattress system as shown on the Project Drawings.

2.04 BEDDING STONE

A. The Contractor shall fill the marine mattress units in accordance with the mattress manufacturer requirements with bedding stone meeting the following:

1. Stone used to fill the mattresses shall be clean, hard, dense, durable, and free from cracks, soft seams, or other structural defects.

2. The stone shall meet the general stone specifications as presented in Section 2.01 – GENERAL STONE SPECIFICATIONS above.

3. The stone shall be well graded and have a maximum dimension of 5 inches and a minimum dimension of 2 inches. Various gradations may be proposed within the above stone range in order to achieve a specific manufacturer-recommended porosity. Concrete rubble is not allowed.

B. Contractor shall also utilize bedding stone as chinking stone as shown in the Project Drawings.

C. The Contractor shall also apply additional bedding stone as needed to create a relatively smooth condition beneath the marine mattress system such as in areas of the existing T-Groin breakwaters where large rocks may be encountered during excavation/grading operations.

2.05 CORE STONE: T-GROINS AND TERMINAL STRUCTURE

A. The Contractor shall provide core stone for the proposed T-Groins and northern terminal structures as shown in the project drawings. The core stone for these structures shall meet the requirements of FDOT Standard Specifications for Road and Bridge Construction – Riprap Rubble for Bank and Shore Protection (Section 530-2.2.1 and 530-2.2.3), except the stone shall also conform to the general stone specifications in Section 2.01. The stone shall have the general weight gradations described as follows:

1. Minimum Stone Weight (W10) = 60 lbs

2. Median Stone Weight (W50) = 290 lbs

3. Maximum Stone Weight (W90) = 750 lbs

B. At least 50% of the stones delivered for a given segment of structure shall have weights equal to or greater than the "W50" value provided above. No more than 10% of the stones delivered for a given segment shall have weight less than the "W10" value provided. No more than 10% of the stones delivered for a given segment shall have a weight in excess of the "W90" value

provided. The Contractor shall not utilize stones weighing more than 1,000 lbs (0.5 tons) or less than 50 lbs without acceptance by the Engineer.

C. The delivered core stone shall contain no more than 50% of the stone with a length to thickness (l/d) ratio greater than 2, and no core stones with a length to thickness (l/d) ratio greater than 3 shall be permitted. Flat stones will not be accepted.

D. The Contractor shall place core stone to the grades and elevations as shown in the Project Drawings. The Contractor will be allowed to substitute armor stone for core stone along the northern terminus structure. The Contractor will not be allowed to substitute any other rock materials without prior acceptance from the Engineer.

2.06 ARMOR STONE: T-GROINS

A. The Contractor shall provide armor stone for the existing and proposed T-Groin structures as shown in the project drawings and having the weight gradations described in the following:

1. Minimum Stone Weight (W10) = 3,500 lbs (1.75 tons)

2. Median Stone Weight (W50) = 5,000 lbs (2.5 tons)

3. Maximum Stone Weight (W90) = 6,500 lbs (3.25 tons)

B. The stones shall be uniformly graded and at least 50% of the stones delivered for a given segment of structure shall have weights equal to or greater than the “W50” value provided above. No more than 10% of the stones delivered for a given segment shall have weight less than the “W10” value provided. No more than 10% of the stones delivered for a given segment shall have a weight in excess of the “W90” value provided. The Contractor shall not utilize stones weighing more than 7,000 lbs (3.5 tons) or less than 3,000 lbs (1.5 tons) without acceptance by the Engineer.

C. The delivered armor stone shall contain no more than 50% of the stone with a length to thickness (l/d) ratio greater than 2, and no armor stones with a length to thickness (l/d) ratio greater than 3 shall be permitted. Flat stones will not be accepted.

2.07 ARMOR STONE: NORTHERN TRANSITION AND TERMINUS STRUCTURE

A. The Contractor shall provide armor stone for the northern transition and terminus structures as shown in the project drawings and having the weight gradations described in the following:

1. Minimum Stone Weight (W10) = 1,500 lbs (0.75 tons)

2. Median Stone Weight (W50) = 2,000 lbs (1.0 tons)

3. Maximum Stone Weight (W90) = 2,500 lbs (1.25 tons)

B. The stones shall be uniformly graded and at least 50% of the stones delivered for a given segment of structure shall have weights equal to or greater than the “W50” value provided above. No more than 10% of the stones delivered for a given segment shall have weight less than the “W10” value provided. No more than 10% of the stones delivered for a given segment shall have a weight in excess of the “W90” value provided. The Contractor shall not utilize stones weighing more than 3,000 lbs (1.5 tons) or less than 1,000 lbs (0.5 tons) without acceptance by the Engineer.

C. The delivered armor stone shall contain no more than 50% of the stone with a length to thickness (l/d) ratio greater than 2, and no armor stones with a length to thickness (l/d) ratio greater than 3 shall be permitted. Flat stones will not be accepted.

2.08 EXISTING STONE

A. Stones excavated or removed from the existing T-Groin and Spur structures during construction operations that generally meet the requirements of these specifications shall be sorted and reused as core stone or on the landward portion of the existing structures. Reused stone shall not be placed on the crest or the seaward face of the structures. Existing stone that does not clearly meet the specifications shall be reused as core stone or “chinking” stone as accepted and directed by the Engineer. No separate payment shall be made for the reused stone.

PART 3 EXECUTION

3.01 EXAMINATION

A. The Contractor shall check the stone materials, geotextiles, geogrid, braid and mechanical connection elements upon delivery to verify that the proper material has been received and the material meets the requirements of these specifications. The Contractor shall also inspect these materials to ensure they are free of flaws or damage that may have occurred during manufacturing, shipping, or handling.

3.02 MATERIAL HANDLING AND STORAGE

A. Stone shall be transported and handled in a manner that minimizes stone breakdown and contamination with dirt, organic matter, or other objectionable material and debris.

B. The marine mattresses and geotextile filter fabric shall be stored in a clean, dry area where it will not be damaged. Fabric rolls shall remain in their original packaging until needed. Rolled materials may be laid flat or stood on end. The contractor shall prevent excessive mud, wet concrete, epoxy, or other deleterious materials from coming in contact with and affixing to the marine mattress, geotextile, or stone materials. The Contractor shall store all geotextile and marine mattress materials at temperatures above –20 degrees F (-29 degrees C).

C. The Contractor shall stockpile and store all materials on site or at an accepted staging area in a manner that does not damage any property or utilities at the storage site, and does not constitute a safety hazard to the public. If stone is stored on site or at an off-site staging area for extended periods, it shall be kept clean and free from debris.

D. The Contractor shall be responsible for obtaining the use of any facilities or lands that may be required for stockpiling of stone materials, marine mattress, or other equipment required for the work. The Contractor shall be responsible for all costs associated with handling and stockpiling of materials.

E. Storage of stone material or marine mattress on the seabed before permanent placement is not permitted.

3.03 SITE PREPARATION

A. The contractor shall excavate or regrade within the footprint of the proposed structures as necessary to attain the required foundation grades as shown in the project drawings. If

excavation is required, any beach quality material excavated from the structure footprint shall be placed immediately landward of the structures or regraded within the structure footprint to reduce the total volume of stone; however, shall not be placed in areas that would prevent the minimum layer thicknesses from being achieved. The Contractor shall excavate or regrade material to the required elevations with methods and best management practices that are in keeping with these drawings, specifications, and permit requirements. If waves or currents refill any excavated area, the Contractor shall re-excavate the areas at no cost to the Owner. The cost for sand excavation shall be included in the unit cost of marine mattress installation on the bid sheet. No separate payment for sand excavation shall be made.

B. Graded slopes within the rock structure footprint(s) shall not be steeper than or exceed 1V:2H. The Contractor shall grade within the structure footprints as necessary to meet the required grades and minimum layer thickness.

C. The surfaces to receive the marine mattress foundation, including existing grades, excavated or regraded areas, shall be prepared to a relatively smooth condition, free of humps, depressions, debris, obstructions, or low-density pockets of material. These areas shall not have slopes exceeding the maximum allowable (1V:2H) or any protrusions/depressions greater than 6 inches from the required grades, or existing grades if laid on existing grade. The Contractor shall apply additional bedding stone as needed to create a relatively smooth condition such as in areas where large rocks are encountered during excavation or grading operations, prior to marine mattress placement.

D. Within existing structure areas, the contractor shall excavate any rocks within the proposed structure footprint and stockpile these materials for later use if within the existing stone gradation specifications. If necessary, the Contractor shall place loose bedding stone to achieve the required grades, slopes, and/or tolerances shown on the project drawings and within these specifications.

3.04 GEOTEXTILE UNDERLAYER

A. The geotextile underlayer (U.S. Fabrics US 670) shall be placed with the marine mattresses simultaneously by pre-attaching the geotextile material to each unit with provision for sufficient overlap of the geotextile as indicated on the Project Drawings. The geotextile underlayer shall be attached directly to the underside of the marine mattress in the factory or in the field as approved by the Manufacturer and accepted by the Engineer.

B. The underlying geotextile shall also be attached to the biaxial geogrid overlap panel extending a minimum of 2 feet beyond the edge of the marine mattress for sufficient overlap with adjacent units as indicated on the project drawings.

C. The geotextile shall be spread smooth along the underside of the marine mattress and biaxial geogrid extension, free of excessive tension, folds, wrinkles, or creases. The underlying geotextile shall be placed such that the long axis of the fabric is parallel to the long axis of the mattress.

D. Torn, punctured, or over-elongated sections of filter fabric shall be removed and replaced with new, undamaged fabric. Any seams in the fabric shall be overlapped by a minimum of 9 inches and sewn to form a secure bond between the adjoined pieces.

3.05 MARINE MATTRESS FABRICATION AND FILLING

The marine mattress shall be constructed and filled in accordance with the manufacturer's specifications. A general summary, as provided by the manufacturer, is presented below.

A. Mechanical Connections: the joints where the ends and baffles of each unit join the top or bottom of the unit, or where the biaxial geogrid overlap panel is attached, shall be made with a mechanical connection between geogrid elements as shown on the Project Drawings or Manufacturer's Shop Drawings.

B. Seaming - Unless otherwise shown on the Project Drawings or Manufacturer's Shop Drawings or approved by the Manufacturer:

1. All cut ends of braid material shall be knotted within 1 to 2 inches of the end to prevent unraveling of the braid material. The braid material shall be securely knotted to the geogrid at all ends of all stitched seams, and at a spacing not to exceed 6 feet along any stitched seam. Pieces of braid material may be spliced end to end by securely knotting.

2. The stitches along each seam shall be sufficiently tight to close the gap between the adjacent pieces of geogrid. The braid material shall be stitched through each pair of apertures along each seam at least once. The spacing of stitches shall be reasonably uniform at approximately 6 (minimum) stitches per foot along the entire length of each seam.

3. Seaming to connect adjacent units is not required.

C. Filling - Unless otherwise shown on the Project Drawings or Manufacturer's Shop Drawings or accepted by the Engineer:

1. Each unit shall be filled and the fill shall be packed while the unit is supported in an upright position resting on its side with the open side facing upward and the long direction of the compartments running vertical. Each compartment shall be filled in lifts and each lift shall be tightly packed, except the final lift. The typical lift height shall not exceed 3 feet (loose) or 2.5 feet (packed). The final lift height shall not exceed 9 inches in height and should overfill each compartment by approximately 2 inches.

2. The stone fill vertical drop height shall not exceed manufacturer's specifications.

3. Packing of the stone fill material and complete filling of each compartment shall be accomplished by rodding and/or vibration. The degree of filling and packing shall be adequate to achieve complete filling as evidenced by tightly confined stone particles, tensioned interior diaphragms, snug bodkin connections, slight bulging of each compartment, and no evidence of air space between compartments during lifting. Excessive bulging of the unit or displacement on the interior diaphragms, such as caused by overpacking or inadequate support, shall not be allowed.

4. Lifting hoops shall be formed by joining the top and bottom layers of grid from each unit by means of manufacturer approved mechanical connections.

5. When filling and fabrication of a unit are complete, the unit shall be rotated to a horizontal position resting on its bottom in order to facilitate subsequent lifting.

6. Filling shall be accomplished in a manner that does not cause excessive damage to the geogrid, mechanical connection elements, braid, biaxial extension, or the geotextile (underlayment) fabric.

3.06 MARINE MATTRESS INSTALLATION

A. Marine mattresses with the two-foot biaxial geogrid overlap panel and geotextile underlayment, shall be placed within the entire breakwater foundation in a manner recommended by the

material manufacturer. Under no condition shall any stones be placed without the marine mattress and geotextile fabric foundation.

B. The mattresses shall be laid flat along the prepared surfaces in a uniform and consistent manner, perpendicular to the long axis of the structure as shown in the project drawings. The longest mattress units shall be placed at the seaward toe of the structure for increased scour resistance and shorter units shall remain internal to the structure.

C. Fully assembled marine mattress units shall only be placed once the required grades have been reached and the subsurface is prepared in accordance with these specifications.

D. Before placing the marine mattress units, any organic material and/or debris on the seabed shall be removed and disposed of by the Contractor. The disposal site for this material shall be offsite and accepted by the Engineer and local municipality.

E. The Contractor shall follow the manufacturer's instructions for assembling, handling, storing and installing the marine mattresses. All mattresses shall be filled, closed, and the geogrid overlap panel and geotextile underlayment attached prior to placement. Personnel shall stay clear of the area beneath units and rigging during lifting. Tag lines and/or divers may be required to facilitate proper placement of the units. Any damaged portion of the mattress or underlayment material shall be replaced immediately and at no cost to the Owner.

F. All mattresses shall abut each other and adjacent sheet pile walls within a tolerance of 3 inches or less. No mattresses shall overlap or be placed atop adjoining mattresses.

G. The manufacturer or manufacturer's representative, and Engineer shall be present during the filling of the first ten (10) marine mattresses in order to confirm proper filling techniques. The Contractor will be responsible for scheduling and coordinating this demonstration. The manufacturer's representative shall be scheduled through the manufacturer contacts as listed in Section 2.2.

H. All mattresses shall be filled, handled, lifted, placed, and fastened in a manner specified by the manufacturer. A general summary of the installation procedure, as provided by the manufacturer, is presented below.

1. Position - The units shall be placed at the proper elevation, alignment and orientation as described in these specifications, shown on the Project Drawings or as directed by the Engineer. The mattresses shall be placed such that the long axis of the mattress is perpendicular with the long axis of the structure.

2. Placement Procedures:

    a. The procedure used in placement of the units shall be in accordance with the recommendations of the system supplier and as accepted by the Engineer.

    b. For lifting of each unit, a spreader beam and/or spreader bars shall be used in a manner that the unit is not subjected to severe bending or distortion and that the top and bottom layers of geogrid are tensioned uniformly across their width.

    c. Units should generally be lifted from a horizontal position.

    d. Personnel shall stay clear of the area beneath units and rigging during lifting. Tag lines and/or divers may be required to facilitate proper placement of the units.

3. Splicing and Anchoring - Where applicable, splicing and/or anchoring of the units shall be accomplished as shown on the Project Drawings, the manufacturer's Shop Drawings or as directed by the manufacturer.

I. The geogrid and underlayment shall be protected at all times during construction from contamination and damage. The Contractor, at no cost to the Owner, shall replace any geogrid or geotextile underlayment contaminated or damaged during its installation or during placement of the stone. Mattresses shall be rejected if it has defects, rips, holes, or flaws.

J. To ensure an adequate breakwater foundation, each subsequent mattress' geotextile underlayment (filter fabric) and grid extension shall overlap the adjacent mattress' geotextile underlayment and grid extension by at least two (2) feet as shown in the project drawings. The Contractor and manufacturer may be required to extend the underlayment and grid extension within curved areas to ensure the minimum overlap is maintained (see below).

K. Along the northern project area where the rock stabilization structure curves (northern T-groin, transition, and terminus), wedge-shaped gaps shall be installed between the ends of the marine mattresses. In such areas, the Contractor shall have the marine mattress manufacturer produce wedge-shaped or triangular units to match the proposed curve alignment. Wedge-shaped mattress units will not be required along the northern curved structure (Northern T-Groin #4, Transition, and Terminus) where internal gaps are less than 2 feet in width; however, the Contractor may be required to provide increased geogrid and underlayment extensions to ensure sufficient overlap and minimize losses of foundation sands within these areas.

L. The Contractor shall protect the geogrid from damage due to the placement of stone or mattress by limiting the height of drop of the material or by use of other placement techniques.

M. The Contractor shall be responsible for verifying the quality and suitability of all materials and construction methods used to install the mattresses are in accordance with manufacturer instructions. The removal of any substandard or damaged materials from the structure and replacement with new materials shall be at the expense of the Contractor.

N. The Owner or Engineer will perform visual observations of the marine mattress during installation operations, both on land and underwater, to ensure assembly and installation techniques are in accordance with these specifications. The removal of any substandard, damaged, or nonconforming materials from the structure and replacement with new materials shall be at the expense of the Contractor.

3.07 STONE PLACEMENT

A. Stone shall be handled and placed in a manner that prevents damage to the marine mattress foundation and minimizes stone breakage. The Contractor shall field monitor to verify careful and accurate placement to ensure stone placement does not damage the marine mattress, underlying geotextile fabric, placed stone, or sheet pile walls. After armor stone placement, the Contractor shall avoid grading which results in the movement of stone directly above the marine mattress.

B. Before placing stone, any organic material and/or debris on the existing stone or seabed shall be removed and disposed of by the Contractor. The disposal site for this material shall be offsite and accepted by the Engineer and local municipality.

C. Stone shall be handled in a manner that minimizes the introduction of dirt, organic matter, or other objectionable materials into the coastal area and minimizes the creation of turbidity in the surrounding waters. Should stone placement result in increased turbidity within the project area, turbidity barriers and/or other measures may be required to insure compliance with permit requirements and state water quality standards.

D. Stone shall only be placed once the required grades have been reached and the marine mattress system is installed. The core, armor and toe protection stone shall be placed as quickly as practical following placement of the marine mattress. To avoid settlement of the structure or

potential foundation failures, the core, armor, and/or toe protection stone at the base of the structure shall be placed directly atop the marine mattress. The Contractor is not permitted to place any base layer stone (core or armor stone) if the marine mattress has become buried by sand or if debris is atop the marine mattress foundation.

E. The Contractor shall place the core and armor stone in numbers and layers as necessary to meet the design template depicted within these Drawings. In no locations shall the structure consist of less than three layers of core stone with a minimum thickness of 4 feet. In no locations shall the structure consist of less than two layers of facing armor stone with a minimum total thickness of 6 feet (for 2.5 ton armor stones) or 4 feet (for 1 ton armor stones). The internal and external (face) slopes of the stone shall not be steeper than indicated on these Drawings and at no time shall be steeper than 1V:2H.

F. The Contractor shall place additional armor stones along the entire seaward edge and portions of the lateral and landward edges of the structure as toe protection stone as shown in the Project Drawings.

G. The Contractor shall place all stones by clamshell, bucket, stone grab or other method as submitted in the stone placement plan and accepted by the Engineer. The stones shall be placed in such a manner that they will properly interlock with the underlying or adjacent stones to resist displacement by wave action to form a uniform and compact section. Stones shall be carefully placed to leave no large interstitial voids. The Contractor shall place the stones one layer at a time, built-up evenly. Stones shall be placed in accordance with the construction sequence unless otherwise accepted by the Engineer. All stone will be placed in a way that produces a mass of unsegregated stone with maximum interlocking and rock-to-rock contact and a minimum of voids.

H. The equipment used in placing the core and armor stone shall be suitable for handling material of the size required, including the ability to place the stone over its final position before release and, if necessary, pick up and reposition the stone. Placement shall begin at the bottom of the slope and progress upward. Moving stone by drifting and manipulating down the slope will not be permitted. Stone shall not be dropped from a height greater than one (1) foot. Stones shall be set in a manner that will ensure that a minimum of four sides of the stone will be in contact with adjacent stones or structures so that interstices between adjacent stones shall be as small as the character of the stone will permit. All stones should be placed in a random fashion as to size and orientation to achieve maximum interlocking and minimum voids. All stones when placed shall be stable, keyed, and interlocked with no hanging or perched stones. Final shaping of the stone shall be performed concurrently with the initial placement of stones to avoid rehandling.

I. The finished work shall be a well-distributed mass, free of pockets of either smaller or larger stone with a minimum of voids and a maximum of interlocking of stone. The finished surface shall be relatively uniform and shall contain the maximum amount of stone as can be obtained by performing the work as specified. The structure will be observed for conformance to the design both during construction and upon completion.

J. The Contractor shall take extra precaution when placing stone adjacent to existing or proposed sheet pile walls or concrete caps. In these areas, the stone shall be placed directly in contact with the wall or the cap; however, should not be placing excessive pressure that may damage the structures. Stone shall not be resting directly atop any sheet pile walls or caps.

K. Along the northern portion of T-Groin #2, where the existing northern 40 – 50 feet of existing sheet pile wall has deteriorated due to rock settlement, the Contractor shall backfill or “chink” all void spaces with additional bedding stone or repurposed/excavated rock materials to increase sand tightness of the structure as shown in the Project Drawings.

L. Should the Contractor propose to construct the concrete caps prior to completing the rock placement, the rock section shall be completed, at a minimum, to within 1-foot vertical of the mean high water line. The Contractor shall complete the full rock section immediately following concrete curing and form removal.

M. Stone placement during periods of wave energy sufficient to cause material displacement shall be at the Contractor's risk. All material lost or displaced during construction as a result of wave displacement shall be replaced at the Contractor's expense.

3.08 TEST SECTION

A. The Contractor shall complete a 25-foot test section of the structure prior to performing work on other sections of the project. The Contractor shall notify the Engineer that the test section is complete, and shall submit a survey consisting of a least two cross-sections to the Engineer for review. The Contractor may continue construction of the structure once the Engineer reviews and accepts the test section.

B. The Engineer may require additional test sections for various structure areas (e.g., northern terminus structure, proposed T-Groin structure, and existing T-Groin structure).

3.09 REPAIR

A. Any marine mattress units, geotextile fabric or mattress components damaged during fabrication, filling, installation, or stone placement shall be repaired in a manner accepted by the Manufacturer and Engineer or shall be replaced by the Contractor. Any such measures required shall be at no additional cost to the Owner.

B. Any stone damaged during the loading, transport, handling, or stone placement operations shall be replaced by the Contractor at no additional cost to the Owner. Damaged stone shall not be utilized within the proposed structures unless accepted by the Engineer.

C. Any sheet pile walls or cap components damaged during stone placement or other related operations shall be replaced by the Contractor at no additional cost to the Owner. Damaged sheet pile walls or caps shall not be utilized within the proposed or existing structures unless accepted in writing by the Engineer.

3.10 INTERRUPTIONS

If the Contractor anticipates that construction will be interrupted for more than four (4) continuous days, including weekend and holidays, the Contractor will be required to complete placement of the marine mattress and/or core and armor stone of the distinct structure segment and provide protection for any exposed ends before start of the interruption. All material used for protecting the exposed ends shall become the property of the Contractor and shall be removed after the need has ended. The removed materials may be incorporated into the permanent construction, as appropriate. All protective materials removed and placed in the permanent construction, will be measured and paid for only once. Any material lost or displaced during an interruption shall be replaced at the Contractor's expense.

3.11 TOLERANCE

A. The finished surface and stone layer thickness shall not deviate from the lines and grades shown on the Drawings by more than the tolerances listed below. Tolerance thicknesses are measured perpendicular to the indicated neat lines.

Vertical Neat Line Tolerances

Material	Above Neat Line (inches)	Below Neat Line (inches)
Toe protection stone	6	6
Armor stone	6	6
Marine mattress	6	6

B. Horizontal tolerances are +/- 1 feet from the plan view layout.

C. Placed material that is beyond the maximum tolerances stated herein is ineligible for payment unless specifically accepted by the Engineer and Owner.

D. The intention is that the work will be built generally to the required elevations, slope, and grade and that the outer surfaces shall be even and present a neat appearance. Placed material not meeting these limits shall be removed or reworked. Excess placed material will not be paid for, and the cost of replacing and/or removing this stone will be deducted from the amounts due to the Contractor.

3.12 AS-BUILT SURVEYS

The Contractor shall conduct and provide post-construction surveys to document the as-built conditions. The As-Built survey shall meet the conditions specified under this Section and Section 01 45 16 Contractor Quality Control.

3.13 PERMITS

The Owner has furnished the regulatory authorizations as issued by the Florida Department of Environmental Protection and U.S. Army Corps of Engineers for the proposed work. The Contractor shall be responsible for obtaining any other necessary permits required to complete the work. The Contractor shall be responsible for ensuring that all work necessary for construction of the structures and associated appurtenances complies with the conditions set forth in the permit documents. The Contractor will obtain and comply with any and all permits for this project. In the case of conflict with these specifications, the permits shall govern. If the Contractor violates any condition of the permits and work is stopped and/or fines are levied by the state of Florida or other public entity, then any additional costs incurred shall be paid by the Contractor and not charged to the Owner.

3.14 MAINTENANCE

A. The Contractor shall be responsible for care and maintenance of all rock slopes and materials until final acceptance by the Owner and Engineer. Damage to an incomplete section due to any cause before acceptance shall be repaired by the Contractor at no additional cost to the Owner.

B. In the event of sliding, settlement or failure of any completed section of the breakwater structure during construction, but before its acceptance, the Contractor shall, upon written order of the Owner and Engineer, remove the failed section and rebuild that portion of the structure. The Contractor may reuse the material if deemed appropriate by the Engineer. The Engineer shall determine the nature of the slide or failure. If, in the opinion of the Engineer, the slide is caused through a fault of the Contractor, the foregoing operations shall be performed without cost to the

Owner. If the slide or failure is due to no fault of the Contractor, the work will be paid for as negotiated with the Owner.

3.15 QUALITY CONTROL

A. The Contractor shall check the geogrid, braid and mechanical connection elements upon delivery to verify that the proper material has been received. These materials shall be inspected by the Contractor to be free of flaws or damage occurring during manufacturing, shipping, or handling.

B. At the delivery site, visual inspections shall be made of all stone material for size, gradations, fractures, and any other defects that may compromise the quality and lifetime of the structure, and to assure that handling during loading, transporting, and unloading does not cause damage to the materials. Any material broken, cracked, not in conformance with the gradation and/or weight limitation, or exhibiting signs of defects, shall be removed from the site and replaced with new stones at no additional expense to the Owner. Final acceptance of the material will be made by the Engineer at the project site following final placement within the completed structure.

C. The Contractor shall be responsible for verifying the quality and suitability of all stone materials and construction methods used to construct the structures. The removal and replacement of any substandard or damaged materials from the structure shall be at the expense of the Contractor.

-- END OF SECTION --