Part 1  General:

1.1  Scope of Work:

A.  The work in this section consists of furnishing all plant, support vessels, labor, materials, equipment and supplies to perform the work required by these specifications, and the schedules and drawings forming parts thereof for dredging the Galveston-Bolivar Ferry Landing as shown on the plans.  The work shall also include the operations to construct a levee closure and enhance the existing levee structure at the Pelican Island Upland Placement site, Cell C.

1.  **Galveston Ferry Landing**: The dredging and placement of this material will be mechanically and hydraulically dredged and be deposited within the Fort San Jacinto Upland Placement Site. No maintenance dredging shall be performed at the Galveston Ferry Landings.

2.  **Bolivar Ferry Landing**: The dredging and placement of this material will be hydraulically dredged. The material shall be used in levee repair at the Pelican Island Upland Placement site, Cell C. Maintenance dredging, as a result of construction, from the Bolivar Ferry Landings existing slips shall be placed in Cell C along with the new work material. Separation of new work material and maintenance material will not be required. Levee repair within the cell will consist of cleaning and restoring the existing weir box to a functional condition, redirecting the existing perimeter ditch, mechanically constructing a containment levee, hydraulically placing and shaping material to complete the levee repair, provide additional material to the existing levee alignment, and final shaping of the hydraulic fill.

B.  The varying bottom width and lengths to be dredged are shown and referred to in the Contract Drawings and Specifications. The Contractor shall remove sufficient material to provide the limiting side and end slopes specified in Article Overdepth, Side and End Slopes below.

C.  The project consists of two main sites to be dredged consisting of a combined total of approximately 436,000 cubic yards of new work dredging. The first site consists of two areas at the Galveston Ferry Landings with a combined yardage of 36,000 cubic yards. The two areas are divided into Slip No. 2, 15,000 cubic yards (a realignment of the existing slip) and Slip No. 3,
21,000 cubic yards (new construction of the third slip). The second site at the Bolivar Ferry Landing will require approximately 400,000 cubic yards of excavation, which shall be dredged after removal of the existing rock breakwater. All estimated quantities are shown on the plans.

D. If the Contractor chooses to operate more than one dredging operation concurrently, no two dredges may occupy more than one ferry landing at the same time in the same area.

1.2 Location:

A. The Galveston-Bolivar Ferry Landings comprise two separate landing facilities located within the landward confines of Bolivar Roads and Galveston Island. The Galveston Ferry Landing is located on the eastern end of Galveston Island adjacent to the Galveston Ship Channel. The Bolivar Ferry Landing is located at the western tip of the Bolivar Peninsula.

1.3 Order of Work:

A. The dredging work shall be performed as specified in the following Articles. All new work dredge material, for the Galveston Ferry Landings shall be hydraulically placed to the Fort San Jacinto Placement Site. All new work dredge material, for the Bolivar Ferry Landings, shall be hydraulically dredged and placed to the Pelican Island Upland Placement site, Cell C. The dredging at the Galveston-Bolivar Ferry Landing shall be performed in a fashion so as not to impede the operations of the ferry installation. Dredging operations may be performed 7 days a week, 24 hours per day if the Contractor desires; however, at least one ferry landing must be open 24 hours per day. Dredging operations shall not interrupt ferry operations during the weekends unless otherwise directed by the Engineer. Weekend times begin Friday at noon and end Sunday at 22:00 hours.

1. **Galveston Ferry Landing:** The Contractor shall employ a two-dredge operation to perform the dredging of Slip No. 2 and Slip No. 3. Dredging Slip No. 3 shall be performed first utilizing a hydraulic dredge, to dredge Slip No. 3 to the lines and grades shown on the Plans, and place the material in the Fort San Jacinto Placement Site. Slip No. 2 shall be the second order of work at the Galveston Ferry Landings. The Contractor shall use a bucket type dredge to dredge the proposed Slip No. 2 to the lines and grades shown on the Plans, with the material side cast into the existing Slip No. 2, allowing a pipeline dredge to pump the material to the Fort San Jacinto Placement Site specified in the Article Placement of Excavated Material.

2. **Bolivar Ferry Landing:** The Bolivar Ferry Landing shall be dredged after the removal of the existing rock breakwater. All material dredged from the Bolivar Ferry Landing shall be hydraulically placed in the Pelican Island Upland Placement Site, Cell C. All new work material dredged shall be used to construct an exterior levee within the Pelican
Island Upland Placement Site, Cell C, specified in the Article Placement of Excavated Material.

3. **Pelican Island Upland Placement site, Cell C:** Prior to any placement of material within the placement site, the Contractor shall clean and restore the existing weir box to a functional condition, redirect the existing perimeter ditch to drain toward the existing weir box, and construct a containment levee across the failed section in the existing perimeter levee.

4. **Hydraulically Placed Levee at Pelican Island Upland Placement Site, Cell C:** Satisfactory materials shall be used to hydraulically construct an exterior levee along the alignment shown to enhance and widen the required containment levee and the existing levee system. The contractor shall mechanically construct a levee, using onsite material, along the centerline of the failed section of levee to contain hydraulic discharge.

1.4 Submittals:

A. Engineering approval is required for all submittals. The following shall be submitted in accordance with the Articles below. Submittals shall be 21 days prior to anticipated commencement of each phase of the work specified herein.

B. Plans:

1. **Construction Plan:** The Contractor shall submit a Plan for dredging the Galveston-Bolivar Ferry Landing Dredge Template including, as a minimum, the following:
   a. The phasing of the dredging, methodology, and equipment to be used.
   b. The placement method and equipment to be used.
   c. Estimated start and completion dates for each phase including sections and depths to be dredged.
   d. A brief description of the proposed execution of the required monitoring of the dredging and placement, as specified in Article Contractor Quality Control below. The description shall include specific details on how the Contractor will monitor and control the placement of the hydraulic fill.

2. **Contractor Quality Control Plan:** The Contractor shall submit a Quality Control Plan detailing the requirements of Article Contractor Quality Control below.

3. **Placement Plan:** The Contractor shall submit a Placement Plan detailing the requirements of Article Placement of Excavated Material below.

4. **Levee Construction Plan, Pelican Island Upland Placement Site Cell C:** The Contractor shall submit a Plan for the construction of the levees and levee closure prior to starting work on this project, including as a minimum the following
a. The phasing and methodology used within the Pelican Island Upland Placement site, Cell C for construction of the mechanical and hydraulic levees, including discharge pipeline locations, with sketches when applicable, and techniques to maximize use of available satisfactory material while meeting water quality standards for the weir box effluent.
b. Estimated start and completion dates for each phase.
c. Proposed pipeline routes.
d. A complete list of plant and equipment to be used for the work.
e. A brief description of the required monitoring of the fill placement.

C. **Plant and Equipment:** A complete list of plant and equipment to be used for each phase of work, including vessel-tracking systems.

D. **Surveys:** Surveys shall be submitted in the project datum and coordinate system and shall include hard copy plots and the electronic files in X,Y,Z ASCII format.

1.5 **Archeological Sites and Shipwrecks:**

A. If during the dredging and placement operations the Contractor encounters archeological sites or shipwrecks of a historical nature, work shall cease immediately pursuant to the Contract Clause entitled “Suspension of Work,” and the Engineer shall be notified by the fastest available means. After investigation by the Engineer, the Contractor will be instructed on how to proceed, and if a delay of more than 14 days is incurred or the work is changed, the Contract will be modified accordingly.

1.6 **Obstruction of Channel:**

A. The Engineer will not undertake to keep the existing Federal, State, and private channels free from vessels or other obstructions, except to the extent of the regulations, if any, as may be prescribed by the Secretary of the Army, in accordance with the provisions of Section 7 of the River and Harbor Act approved 8 August 1917.

B. The Contractor shall conduct the work using a method that will obstruct navigation as little as possible. If the Contractor’s plant or equipment does obstruct these Channels and makes difficult or endangers the passage of vessels, the plant or equipment shall be promptly moved on the approach of a vessel to afford a safe passage.

C. Upon completion of the work, the Contractor shall promptly remove his plant and equipment including ranges, buoys, piles and other marks placed by the Contractor.

1.7 **Temporary Removal of Aids to Navigation:**
A. The temporary removal or changes in locations of Channel markers or
docking dolphins may be required to facilitate dredging operations. The
Contractor shall notify the Engineer and the U.S. Coast Guard, ATON Group
at least 21 days prior to the date that the removal or change in location of
Channel markers or docking dolphins will be required in order that the U.S.
Coast Guard can perform the work, and that navigation interests may be
informed sufficiently in advance of the proposed removal or change in
location.

1.8 Notification Prior to Commencement of Dredging Operations:

A. The Contractor shall notify the Engineer and the U.S. Army Corps of
Engineers, Navigation Section, in writing, at least 21 days prior to the
commencement of dredging operations, of the location(s) at which a dredge or
dredges will be placed on the work site. The Contractor shall notify the
Engineer of the pipeline routes selected within the same time frame. Within
21 days after receiving the Notice to Proceed on this Contract, the Contractor
shall notify the U.S. Army Corps of Engineers, Galveston District, Attention:
Navigation Section, P. O. Box 1229, Galveston, Texas 77553-1229, and the
Port of Galveston, Mr. Albert Churchill, P. O. Box 328, Galveston, Texas
77553, of his planned actions, including the stop and start dates of all
activities in the Pelican Island and Fort San Jacinto Dredged Material
Placement Areas. As a minimum, the Contractor shall be required to notify
each party of changes in planned occupancy in each site every 60 days after
the initial notification. Copies of all notifications shall be furnished to the
Engineer.

1.9 Obstructions within the Limits of Dredging:

A. An unknown ferrous object is located within the dredging boundaries of
Galveston Slip No. 3. This object is suspected to be a section of dredge pipe.
The Contractor shall investigate existing conditions and satisfy itself as to the
location and existence of the object and determine the best removal method.

<table>
<thead>
<tr>
<th>Approximate Location</th>
<th>Description</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Located within the dredging boundaries of Slip No. 3</td>
<td>Ferrous Object</td>
<td>Galveston Ferry Landing Slip No. 3</td>
</tr>
</tbody>
</table>

B. Every effort has been made to give all pertinent details on the location of the
object. The data furnished on the plans are believed to be substantially correct.
However, the exact locations may vary from that shown; therefore, the
Contractor shall perform an assessment to establish the actual position of the
object.

C. No additional compensation shall be given to the Contractor for the removal
of this or any other objects or obstructions that may be encountered during
any marine construction portion of these Special Specifications. In addition to
the ferrous items depicted, the Contractor should expect various quantities of ferrous and nonferrous debris, indicative of dockside dredging operations.

1.10 Character of Materials:

A. Explorations, including core borings, to determine the character of materials to be removed have been performed by the Engineer and the results are provided with the Contract Documents. The Contractor is also expected to examine the work site and make a determination as to the character of the materials to be dredged.

B. Soils: The material to be removed, as specified herein, is primarily new work soils, occasional broken rock, sandstone, and includes sediment that has accumulated since the last maintenance dredging. Bidders are expected to examine the records and decide the character, quality and quantity of the material to be dredged.

C. Debris:

1. Prior to dredging, the Contractor shall carefully inspect the entire area to be dredged by the method the Contractor deems suitable to locate debris that may interfere or impede with dredging operations.

2. During progress of the work, the Contractor shall not deposit worn out discharge pipe, wire rope, scrap metal, timbers, or other rubbish or obstructive material in the Galveston-Bolivar Ferry landings or adjacent channels. This material, together with scrap, rope, wire cable, piles, pipe or other obstructive materials commonly encountered during dredging activities shall be expected and the Contractor shall dispose this debris at approved locations offsite. No separate payment will be made for removal and disposal of this debris.
Part 2 Products:

2.1 Plant and Equipment:
A. A list of plant and equipment with accompanying specifications shall be submitted prior to commencement of dredging.

2.2 Placement Area Equipment:
A. Construction and/or excavation of the placement area if necessary shall be accomplished with draglines, backhoes, marsh excavators, shovels or other suitable construction and/or excavating equipment.

2.3 Bridge-to-Bridge Radiotelephone Equipment:
A. Dredge and self-propelled attendant floating plant shall be radiotelephone-equipped to comply with the provisions of the Vessel Bridge-to-Bridge Radiotelephone Act (Public Law 92-63). This will require, as a minimum, the radiotelephone equipment capable of transmitting and receiving on 156.65 MHz (Channel 13). Multi-channel equipment will also require 156.8 MHz (Channel 16). Dredge tugs and tenders will be considered towing vessels within the meaning of the Act.

2.4 Weir Boards:
A. All weir boards for use in the weir box structure at the Pelican Island Upland Placement site, Cell C shall be furnished and installed as stated in section Drainage Ditch and Existing Weir Box.

2.5 Seed Mix:
A. A seed mix shall consist of Hulled Coastal Bermuda Grass and Unhulled Coastal Bermuda Grass.

Part 3 Execution:

3.1 Estimated Quantities:
A. **New Work Required Dredging Prism**: The total estimated quantity of material required to be removed from the dredging prism, exclusive of allowable overdepth, to complete the work specified in Article SCOPE OF WORK, in cubic yards in-place measurement, is as follows:

<table>
<thead>
<tr>
<th>Location</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Galveston Ferry Landing, Slip No. 2</td>
<td>16,400 cubic yards</td>
</tr>
<tr>
<td>Galveston Ferry Landing, Slip No. 3</td>
<td>13,600 cubic yards</td>
</tr>
<tr>
<td>Bolivar Ferry Landings, New Work</td>
<td>330,000 cubic yards</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>360,000 cubic yards</strong></td>
</tr>
</tbody>
</table>
B. **New Work Overdepth:** The maximum amount of allowable overdepth dredging is estimated in cubic yards in-place measurement as follows:

<table>
<thead>
<tr>
<th>Location</th>
<th>Cubic Yards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Galveston Ferry Landing, Slip No. 2</td>
<td>4,500</td>
</tr>
<tr>
<td>Galveston Ferry Landing, Slip No. 3</td>
<td>1,500</td>
</tr>
<tr>
<td>Bolivar Ferry Landings, New Work</td>
<td>70,000</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>76,000</strong></td>
</tr>
</tbody>
</table>

C. **Estimated Quantities:** Within the limit of available funds, the Contractor will be required to excavate the entire quantity of material necessary to complete the work specified above, be it more or less than the amounts above estimated. Work is to be done in accordance with the Contract and at the contract price or prices.

3.2 **Dredge Monitoring Requirements:**

A. **Mechanical Dredge:** If the dredge is a mechanical type (bucket) dredge, the following elements shall be monitored, recorded and submitted electronically as a minimum:

1. Dredge I.D. designation.
2. Dredge bucket location in the X, Y and Z directions at both the bucket grab closing point and the bucket release or opening point over a transport vessel or stockpile placement,

B. **Hydraulic Dredge:** If the dredge is a hydraulic-type dredge, the following elements shall be monitored, recorded and submitted electronically as a minimum:

1. Dredge I.D. designation.
2. Dredge cutterhead location in the X, Y and Z directions on a minimum of 30-second intervals during excavation.
3. Dredge location in the X, Y and Z directions on a minimum of 5-minute intervals.

C. **Other Dredge:** If another type of dredge is used, these same basic elements shall be required to be monitored, recorded and submitted electronically to specifically document where the excavation takes place, how the excavated material moves to the Upland Placement Site, and/or Offshore Placement Site and proof that the excavated material was properly placed into the proper placement site.

D. **Existing Structures:** The Contractor shall maintain a no dredge perimeter around and near all existing structures to a minimum of 10 feet. All damage to existing structures as a result of the Contractor’s negligence shall be repaired by the Contractor, to the approval of the Engineer, and at the expense of the Contractor. The Contractor shall maintain all monitoring efforts as outlined in this Article during the excavation of material around and near all existing structures. The Contractor shall not perform any type of dredging operation.
near existing structures without a fully operational electronic positioning system as stated in this Article.

E. **Monitoring Data:** The required monitoring data shall be compiled and submitted weekly in an approved electronic media. The initial submittal shall include a graphical user interface to provide a plan view of the vessel tracking (X, Y, Z) data with drafts of the vessels updated digitally.

F. **Dredge Plant Instrumentation:** The dredge plant instrumentation is a part of the dredge plant and shall be functional at all times. If failure of any part thereof occurs, the Contractor shall repair the failed part within the next 36 hours restoring full operations. If the repair does not occur within that period, the particular plant affected will be considered non-responsive to this contract requirement and shall either be replaced or a redundancy part added to render the plant fully operational to include the monitored data, all at no additional cost or time to this Contract.

3.3 **Contractor Quality Control:**

A. The Contractor shall establish and maintain a Quality Control System for dredging operations to assure compliance with the Contract requirements and record inspections and tests under this system.

B. **Quality Control for Dredging:** The Contractor shall prepare and maintain a daily dredging report. The Contractor is required to submit the daily reports to the Engineer by 2:00 p.m. the following day. The Contractor will be required to print and sign reports and submit the originals.

C. **Electronic Positioning:** While dredging in the ferry landings, the Contractor shall control the horizontal positioning of the dredge using a state-of-the-art electronic horizontal positioning system. The Contractor shall use the electronic horizontal positioning system to ensure no construction occurs within 10 feet of all existing structures. While making the required surveys, the Contractor shall use an electronic horizontal positioning system. The electronic horizontal positioning system for the dredge and survey processes shall be a range/range, range/azimuth, GPS, DGPS, etc. with manufacturer’s guarantee of no greater than one meter positional error at any time after calibration. The dredge’s electronic horizontal positioning equipment shall be installed and operated at all times.

D. **Quality Control for Surveys:** The Contractor shall establish and maintain quality control for operations specified herein. The Contractor shall assure compliance with contractual requirements and maintain records of quality control for qualification of survey personnel, and accuracy and completeness of required survey work including, but not limited to, the following:

1. Daily reports shall be made by the Contractor for the days requiring surveying activity. Reports shall be prepared daily and signed by the Contractor’s authorized representative and submitted on the next duty day following the surveying activity. These reports shall include, but not
limited to: equipment used, location, description and type of work performed, inspections of this work, verbal instructions received, and actions taken, safety, and causes of delays.

2. Survey work is subject to periodic inspection or verification by the Engineer during or after this work. If a portion of the surveys is found to be in error, it shall be the responsibility of the Contractor to correct such errors at no cost to the State. Presence of the Engineer on the work site does not release the Contractor of the responsibility for providing quality control of the required survey work and does not release the Contractor from the responsibility of taking necessary corrective action if errors are found. The determination of acceptable and unacceptable dredged channel remains the responsibility of the Contractor.

E. **Records:** A copy of the records of inspections and surveys, as well as the records of corrective action taken, shall be submitted as directed.

F. **Reports:** Daily reports shall be submitted within 24 hours containing the results of the quality control surveys taken during placement activities. Submittal shall include hard copy plots and electronic files. Additionally, the Contractor shall send the reports to a list of email addresses that will be provided at the preconstruction conference. The report shall include the following but not limited to:

1. Date
2. Gross dredging quantity for the last 24 hours.
3. Gross dredging quantity to date.
4. Ending stations of initial placement for the last 24 hours.
5. Ending stations of initial placement to date.
6. Station and offset boundaries for dredging for the last 24 hours.
7. Control of discharge, other comments.

G. **Upland Placement Areas:**

1. The Contractor shall conduct daily inspections of the construction activities for compliance with the Contract requirements and shall record the inspection of operations, including, but not limited to, the following:
   a. Vegetation Stripping: Areas as specified, depth and disposition of materials.
   b. Excavation: Side slopes, dimensions and elevations, deposition of materials within the limits of the Plans.
   c. Placement Fill: Monitoring of the initial placement of material shall be made based on cross section surveys specified herein.
   d. Daily inspections of all retaining levees at the Pelican Island Upland Placement Site, Cell C and the Fort San Jacinto Placement Site.

2. The Quality Control Report shall include the information required to accomplish monitoring of initial placement. The report shall include a
description of the control of discharge and a discussion of prior and ongoing placement activities during the previous 24 hours.

H. Weir Samples: Each sample at the weir shall be made up by partially filling, without overflow, a one-quart container with the mixture flowing over the weir at not less than three different places in the length of the weir and combining the mixture in a bucket or other suitable container submerged to a depth of not over 2 feet.

I. Inspection: Engineering Inspectors plan to inspect and take water samples no less than once a week. The Contractor shall provide assistance necessary to the Engineer Inspectors.

J. Records: A copy of the records of inspections and tests, as well as records of corrective action taken, shall be submitted as directed.

3.4 Perimeter Ditch and Existing Weir Box:

A. Perimeter Ditch: A perimeter ditch will be constructed from the edge of the borrow area to the weir box. The material excavated from the cut shall be side cast to the toe of the existing levee structure and placed as such to prevent material from falling back into the cut. The contractor shall limit his excavation to the minimum necessary as shown on the Plans.

B. Existing Weir Box: The Contractor shall restore the existing weir box to a functional condition prior to any hydraulic placement. Excavation for the structure shall conform to the dimensions and elevations for the structure. Material removed from the structure shall be side cast so as not to allow the material to fall back into the weir box. Excavation shall be performed using a method that will ensure that the area immediately surrounding the structure will allow for continual and effective drainage into the weir box. The Contractor shall not excavate below the foundation of the structure.

C. Weir Boards: The Contractor shall provide weir boards meeting the requirements specified below and sized to fit the weir box structure at the Pelican Island Upland Placement site, Cell C. The rough-cut board sizes and quantity shall be determined in the field by the Contractor. The weir box structure has 12 bays, 8 to 10 feet in height. Boards shall be provided for the full height of the structure. The Contractor shall field verify the board thickness and lengths required. Cost for these boards and their handling and operation shall be incidental to the cost of the fill placement and dredging. Weir boards to be furnished shall be straight, even sawed, sound, and entirely free from defects that can impair its durability or its usefulness for the purpose intended. All weir boards shall bear the official Grade mark of the association under whose rules it is purchased or in lieu thereof. A certificate of inspection issued by the inspection association shall accompany each shipment. Weir boards shall have a Chromated Copper Arsenate (CCA) preservative treatment and shall be accompanied by a certificate from a recognized treatment company certifying the amount of treatment.
3.5 Mechanically Constructed Levee:

A. **General:** The mechanical levee at the Pelican Island Upland Placement site, Cell C shall be constructed to the minimum lines, grades shown using existing material on site. The borrow area identified shall be stripped of vegetation. Stripped materials should be buried within the site and a minimum of 2 feet cover to prevent movement to the weir box. All excavation shall be performed within the vertical limits of the borrow area shown and within 100 feet past each end of the breach. Existing levees may be degraded to provide a foundation fill to start the repairs. Any degraded areas shall be restored to the preconstruction conditions with material from the borrow area. Under no circumstances will excavation occur below the designated limit of cut as shown. To the greatest extent practicable, all excavations shall be performed in a uniform and continuous manner so as to avoid creating multiple holes, valleys, or ridges within the borrow area.

B. **Pre-Fill Containment Levee:** The mechanical levee shall be constructed by dragline, dozer, or other methods at the Contractors discretion. The mechanical levee shall be constructed to repair the breach shown on the plans prior to the placement of any hydraulic fill. This type of levee shall be used as a temporary exterior levee to contain the hydraulic fill during construction. If the levee can not be mechanically constructed to the required elevation, the Contractor shall inform the Engineer and obtain permission to construct the levee hydraulically, as stated below in Hydraulically Constructed Levee.

C. **Compaction and Lift Thickness:** The mechanical levee shall be built in 12 to 18 inch loose layers. Each layer shall be compacted by a minimum of two passes of a wide track D-4 dozer or approved equal.

D. **Grade Tolerances:** Levees shall be constructed to the lines and grades shown at a minimum. There shall be no abrupt humps or depressions in the sloped surfaces or in the width of the crown. All final acceptance levee crown sections will be sloped to drain to the interior of the placement site.

E. After final acceptance of the mechanical levee, the levee and 100 feet past each end of the repair shall be covered from the crown to 10 feet past the inside toe of the levee with polyethylene sheeting of 6-millimeters in thickness. The sheeting shall be secured to the dike using sand bags and ropes anchored to the outer crown on 50-foot centers. All cost associated with furnishing and installing the polyethylene sheeting are incidental to dredging and placement of the hydraulic fill.

3.6 Hydraulically Constructed Levee:

A. **General:** Satisfactory materials used for hydraulically constructed exterior levee and enhancement of the existing levees at the Pelican Island Upland Placement site, Cell C, shall be obtained from the required dredging at the Bolivar Ferry Landings. The Contractor shall evenly distribute hydraulic fill material at all locations along the levee such that the final acceptance levee sections can be constructed to the minimum lines and grades shown. All final
acceptance levee sections will be sloped to drain to the interior of the placement site.

B. **Initial Placement:** The initial placement of material for the hydraulically constructed levee shall consist of controlled discharge of the dredged material along the alignment of the new required levee. The Contractor shall take reasonable measures available to retain satisfactory material within the specified limits of recovery, including the control of discharge actions specified herein. For this contract, “limits of recovery” will be used to refer to the limits of depth and distance from the newly constructed levee within which material shown by cross section after initial placement can be recovered during final shaping and grading, to construct the levee to final grade. The limits of recovery will be dictated by the Contractor, based on observed behavior of the discharged material, type of equipment, and the procedure used to recover the initial placed material.

C. **Control of Discharge:** During the initial placement, the Contractor shall use frequent movement of the discharge point to retain the maximum quantity of material possible within the limits of recovery. Direction of the discharge flow shall be accomplished using marsh excavating equipment or suitable, approved alternative equipment, to provide for continuous removal of material mounding in front of the pipe or other locations, which can result in lateral-direction of material from the limits of recovery. Additionally, spreaders, spoons, or other effective measures shall be employed, as required, to limit lateral loss of sands. The Contractor shall also use a “Y” valve and lateral “shunt” discharge line for discharging water and maintenance slurry, to minimize erosion of previously placed levee fill and the existing levees. The method used to place the hydraulic fill shall maximize the use of the material and minimize waste of satisfactory materials.

D. **Grade Tolerances:** For acceptance, levee construction shall be constructed, as a minimum, to the lines, grades, and elevations shown. Excess satisfactory material shall not be wasted. It shall be used to construct, shape and/or increase the crown elevation of the constructed levee. The constructed levee shall be graded and shaped to allow for drainage to the inside of the cell. Final alignment of the exterior levee shall be within 20 feet for the new levee centerline shown unless otherwise approved. Transitions in alignments must be smooth and no more than 2 feet in a 100-foot length.

3.7 **Seeding:**

A. At the completion of all levee work seeding shall be performed on the outer slope of the perimeter levee in all areas disturbed during construction. Seed shall be uniformly broadcast with fertilizer. Areas to be seeded shall be cultivated to a depth of at least 4 inches. After broad casting, seeds shall be tilled into the soil to a depth not to exceed ½ inch. Broad casting rates shall be 50 pounds per acre.

3.8 **Levee and Borrow Site Clearing and Grubbing:**
A. **Vegetation Stripping:** The area or any portion of the area within the limits of the levee foundations which is to receive fill and is covered with vegetation and other adjacent areas as shown, shall be stripped to a minimum depth of 6 inches to remove humus, vegetation, brush, and roots. All borrow area surfaces shall be stripped of vegetation as stated above.

B. **Disposition of Stripped Materials:** Stripped materials shall be buried within the site to prevent floating debris within the site.

C. **Levee Construction:** No excavation of the existing levee structure shall be performed without written approval or specified herein.

3.9 **Placement of Excavated Material:**

A. **General:** The Contractor shall excavated all new work material, at the Galveston Ferry Landings, and all material shall be placed via a pipeline into the Fort San Jacinto Placement site as shown. All new work material excavated from the Bolivar Ferry Landing shall be placed via a pipeline, and discharged, into Pelican Island Upland Placement site, Cell C. The Contractor shall develop his placement procedures based on these requirements and restrictions. The Contractor shall submit a Placement Plan for approval prior to placement of dredged material under this Contract. The Contractor’s Placement Plan shall be completely explanatory and include the assumptions, statements of fact, computations, and a narrative to fully explain the procedures that the Contractor will follow during this Contract. The Contractor’s Placement Plan shall address each different placement situation.

B. **Permits:** Permits will be procured by the State for deposition of dredged material in the designated Placement Sites.

C. **Placement Site Surveys:** During the course of levee construction, the Contractor shall perform daily topographic surveys for submittal. These surveys shall encompass the previous day’s construction to the maximum extent practicable. The results shall be presented in both graphical and digital formats. The digital data shall be X,Y,Z format and in the project datum. The graphical format shall consist of cross sections at scales not smaller than 1-inch equals 50 feet horizontal and 1-inch equals 10 feet vertical so that each section can be presented on 8-1/2 by 11 inch paper. Cross sections intervals shall be 50 feet on center with a data density no smaller than one elevation shot every 10 linear feet on line. Additional elevation shots shall be taken at the levee crowns and at abrupt changes in grade. One set of cross sections shall be taken after final shaping and grading. Temporary bench marks and controls established by the Contractor to perform the surveys shall be verified by Real Time Kinematic Global Positioning Systems on a weekly basis, at a minimum. The results of the surveys shall be submitted with the Daily Quality Control Reports.

D. **Data Submittal of Final Surveys:** The Contractor shall submit this data in “raw” form including fathometer charts and books, plotted form, and on digital media in ASCII *.XYZ format within five working days after the
surveys are completed. Costs associated with the required soundings and data compilation will be included in the applicable contract unit price for “Dredging Galveston-Bolivar Ferry Landings.

E. **Fort San Jacinto and Pelican Island Upland Placement site, Cell C**

**Placement Areas:** A hydraulic cutterhead pipeline dredge shall be used to pump all dredged material from the Galveston Ferry Landings and Bolivar Ferry Landings respectively to the Fort San Jacinto Placement Area located on Galveston Island and the Pelican Island Upland Placement site, Cell C, located on Pelican Island. No material from the Bolivar Ferry Landings shall be placed within the Fort San Jacinto Placement Area.

1. **Placement Area Inspection:** The Contractor shall inspect the proposed Placement Area to ensure that using the areas for placement operations will not place the Contractor in violation of the applicable federal, state or local statutes concerning fish and wildlife. Particular statutes which the Contractor shall consider include, but are not limited to, the Federal Migratory Bird Treaty Act and the Endangered Species Act of 1973. Placement of material into the Pelican Island Upland Placement site, Cell C shall be done between the months of September 30th and April 1st due to migratory bird nesting activity. No work shall be conducted within 1000 feet of active nesting.

2. **Placed and Excavated Material:** Except as otherwise noted, material shall not be deposited or allowed to flow into the project channels, a bayou, stream tributary to the Waterway, an existing drainage outlet ditch, canal, water intake, or outlet facility; nor shall materials be allowed to flow onto improved areas in or adjacent to the Placement Area. In the event a stream, bayou, drainage outlet ditch, canal, water intake or outlet facility becomes shoaled as a result of the dredging or placement operations, the Contractor shall promptly remove these shoals and the material shall be placed in the Placement Area. Dredging or washing operations to remove the shoals will not be permitted. Holes dug on the banks for deadmen or anchorage shall be filled. The Contractor shall adequately inspect its placement operations in the Placement Area daily to reduce the possibility of accidental breaching of levees and outlet structures with resulting spillage of dredged materials outside the area. If levee failures occur while materials are being pumped into the Placement Area, dredging operations shall be stopped immediately and the deposit of material in the area shall not be resumed until the confining structures have been restored to a condition considered satisfactory by the Engineer. Materials shall be deposited using a method that will not impound water nor obstruct natural drainage. Once placement operations are completed in a confined area for which the Placement Area is being used, the boards on the outlet structure of that Placement Area shall be removed at a proper rate to allow drainage of the area, while meeting the State water quality standard of 300 milligrams per liter of TSS. Every effort has been made to give pertinent details on the location of existing utility pipelines, structures and other facilities which may be encountered in performing
the levee and outlet structure work. The data shown are substantially
correct, however, the Contractor may investigate the existing conditions
and satisfy itself as to the existence of additional construction, which
may interfere with the work herein specified. In confined areas, levee
and outlet structure work required shall be completed and approved
prior to placement operations in that area. Confined areas shall be
maintained in operational condition until completion and acceptance of
the work in this Contract, after draining the site to the mud line in front
of the weir box.

3. **Discharge Effluent:** Effluent from each spillway and the corresponding
receiving water shall be sampled at least daily by the Contractor. When
the effluent density exceeds 300 milligrams per liter of total suspended
solids (TSS), the Contractor will immediately provide additional
ponding capacity by raising the drop-outlet structure invert, as
necessary, or modify and/or discontinue dredge placement operations
into the Placement Area until the effluent density returns to the
acceptable 300 milligrams per liter of TSS. The minimum frequency of
sampling at the weir shall be increased when the effluent density
increases or nears the maximum specified limit. Base samples of the
receiving body of water shall be taken upstream or opposite to the
direction of tidal flow where the discharge effluent enters the Channel.
The Contractor shall report the test results on the daily report of
operation and submit copies to the Engineer.

F. **Pipelines:**

1. **Route:** The landward dredge pipeline route from the Galveston Ferry
Landings to the Placement Area is shown. The Contractor shall notify
the Office of the U. S. Army Corps of Engineers, Navigation Section,
Jadwin Building, 2000 Fort Point Road, Galveston, Texas, 21 days in
advance prior to occupation of the pipeline route shown. A detailed
pipeline diagram shall be submitted for approval prior to commencing
work on the project.

2. **Trenching Operations:** Every effort has been made to give the
pertinent details on the locations of utility pipelines and other facilities,
which may be encountered. The data shown are substantially correct.
However, the Contractor shall investigate existing conditions and satisfy
itself as to the existence of additional construction, which may interfere
with pipeline laying under these specifications.

3. **Submerged Dredge Pipeline:** If the Contractor elects to use a
submerged section in the dredge discharge pipeline for crossing a
Navigable Channel, it may do so without the formality of obtaining a
Department of the Army permit for work or structures in navigable
waters. The Contractor shall coordinate the submerged pipeline
crossings with the U. S. Coast Guard Marine Safety Office (MSO), U.
S. Coast Guard Vessel Traffic Service (VTS) and the Houston and
Galveston Pilots Association (HPA). At least 5 days shall be allowed for
comments. Comments shall be coordinated with the Engineer. Concerns
regarding impact of navigation will be considered and final resolution
will be made by the Contractor, Engineer, MSO, VTS and HPA. However, three copies of detailed plans of the submerged section shall be submitted and approved prior to use of the submerged section. The plans shall indicate clearly the width and depth of the navigation opening and the method used to mark the area by day, and by night, for the safety of navigation. The submerged section shall be buried in the channel bottom, from toe-to-toe, with the riser sections buried in the tapered side slope sections of the Channel. The highest point on the pipe or ball connection occurring across the bottom width of the submerged section shall not be higher than 20 feet below NAVD88. Lighted buoys and description of the lateral system of buoyage, meeting the current requirements of the U. S. Coast Guard Publication COMDTINST M16500 (Series) “Aids to Navigation Manual”. Dredges and associated pipelines shall be in accordance with the U. S. Code Title 33, Chapter 34, Section 2027 (Rule 27); Code of U. S. Regulation (33 CFR 62.25), as applicable.

G. Unauthorized Placement of Material:

1. Misplaced Excavated Material: Excavated material that is deposited in places other than those designated or approved will not be paid for, and the Contractor may be required to remove such misplaced excavated material and deposit it where directed at Contractor’s expense.

2. Debris: Prior to dredging, the Contractor shall carefully inspect the entire area to be dredged by the method the Contractor deems suitable to locate debris which may interfere with dredging operations. During the progress of the work, the Contractor shall not deposit worn out discharge pipe, wire rope, scrap metal, timbers, other rubbish or obstructive material in the Placement Areas or along the banks of the navigable waters. This material, together with scrap, rope, wire, cable, piles, pipe or other obstructive material which may be encountered during the dredging operations, shall be placed by the Contractor at approved locations.

H. Easements: Permits authorizing the laying of shore pipe, and for placement of dredged material in the Placement Areas, are on file and available for examination in the office of the Engineer and the U. S. Army Corps of Engineers, Jadwin Building, 2000 Fort Point Road, Galveston, Texas. The instruments authorizing the laying of shore pipelines may contain certain restrictions relative to specific route, location and general use of the land. These instruments form a part of these specifications and the Contractor shall strictly comply with the terms thereof.

I. Preservation of Public and Private Property:

1. Damages: Fences, roads, ditches, private or public grounds and other structures or improvements, damaged as a result of the Contractor’s operations under these specifications shall be repaired or rebuilt by the Contractor at its expense. The areas used by the Contractor in laying and
maintaining its pipelines shall be restored to the same or as good a condition as existed prior to commencement of the work. Upon completion of the work, the ends of the culverts shall be fully closed with wooden bulkheads and trenches, and bank cuts shall be backfilled to original ground level and seeded.

2. **Restoration:** The Contractor shall preserve and protect the existing informational and directional signs, facilities, water wells and tanks, station markers, mile markers and mooring piles which have been established along either bank of the Waterway within the reaches of the dredging operations covered by these specifications. The Contractor shall be liable for and will be required to replace or restore at its expense the signs, facilities, water wells and tanks, markers and mooring piles damaged or destroyed as a result of dredging operations under these specifications.

J. **Alternate Placement Area(s) Proposed by Contractor After Award of Contract:**

1. **Alternate Placement Area(s):** If, after award of the contract, a placement area(s) other than that specified herein is proposed, its acceptance will be subject to approval. The Contractor shall furnish written permission from the owners for the use of the substitute placement area(s) and written permission from the owners of the properties involved in obtaining access to the substitute placement area(s). The Contractor shall coordinate the use of the substitute placement area(s) with federal, state, and local fish and wildlife, conservation and pollution control agencies and shall submit, with its proposal, documentation that demonstrates compliance with the applicable laws and regulations pertinent to designation and coordination of dredged material placement area(s). The Galveston District shall be consulted for specific requirements. Expenses incurred in connection with providing and making available another placement area(s) shall be borne by the Contractor. Materials deposited thereon and operations in connection therewith shall be at the Contractor’s risk.

2. **Data Submittal:** The award of the modification will be subject to the approval of the proposed Contractor-furnished placement area(s) and unless the foregoing required data are furnished with the Contractor’s request, the modification for the use of the proposed substitute placement area(s) will not be considered.

3.10 **Overdepth, Side and End Slopes:**

A. **Overdepth:** To cover inaccuracies of the dredging process, material actually removed from within the specific areas to be dredged to depths as specified herein will be estimated and paid for at the Contract price or prices.

B. **Side and End Slopes:** Material actually removed from within limits, as approved, to provide for final side and end slopes, but not in excess of the amounts originally above these limiting side and end slopes, will be estimated...
and paid for whether dredged in original position or by dredging space below the pay slope plane at the bottom of the slope for upslope material capable of falling into the cut. In computing the limiting amount of side and end slopes dredging, net dimensions without allowance for overdepth, will be used.

1. **Excessive Dredging:** This subparagraph shall apply to all dredging. Excessive dredging will be deducted from the actual amount dredged within the required dredging prism and the allowable overdepth. Excessive dredging will be defined as material removed beyond one foot below the lower limit of allowable overdepth. The amount of excessive dredging will be calculated from surveys taken by the Engineer and will not be subject to appeal.

3.11 **Houston-Galveston Vessel Traffic Service Area.**

A. The Contractor shall comply with the following requirements while operating within the Houston-Galveston Vessel Traffic Service (VTS) area.

1. **General:** When a dredge or floating plant is to be operated within the Houston-Galveston VTS Area, the master shall furnish the Vessel Traffic Center the following report at least 30 minutes prior to beginning operations:
   a. Location of intended operation.
   b. Description of intended operation including Channel obstructions.
   c. Configuration of pipelines, if any, crossing the Channel.
   d. Termination point of pipelines, if any, crossing the Channel.
   e. Time required to reopen the Channel or move for vessel traffic.
   f. Operating impairments including VHF-FM radios.

2. **Report Changes:** The master of a dredge or floating plant shall immediately notify the VTS of changes to the above report and at the completion of operations.

3. **Vessel Traffic Service Location:** The Houston-Galveston VTS Area consists of the navigational Channels between the Galveston Entrance Channel Buoy 1 and the Houston Turning Basin, Galveston Channel, Texas City Channel, Bayport Channel, the Gulf Intracoastal Waterway, and Galveston-Freeport Cutoff from Mile 346 to Mile 352.

4. **Communications:** Communications with the Vessel Traffic Center call sign “Houston Traffic” shall be accomplished via VHF-FM Channel 12. The Traffic Center guards both Channel 12 and Channel 13 on a 24-hour basis. All self-propelled vessels, regardless of length, will monitor VHF Channel 13 while operating, or preparing to operate, inside the beacons of the Houston Ship Channel.

5. **Operations:** The master of a dredge or floating plant shall be aware of and comply with the provisions of the “Order Relating to Lightering and Bunkering Operations and Multiple Vessel Moorings” and will notify the Houston-Galveston VTS when refueling operations are to be conducted.
3.12 Removal of Existing Stone Breakwater:

A. **Description:** Located at the Bolivar Ferry Landing is a breakwater dividing the existing north slip and the south slip. The breakwater extends 700 feet seaward, perpendicular to the shoreline and is connected to an existing shoreline revetment. The breakwater is constructed of approximately 5,190 tons of granite cap stone, 3,500 tons of core stone, and 4,800 tons of blanket stone. The Contractor shall remove all cap stone, core stone, and blanket stone down to 6 inches in diameter. The Contractor shall inspect the breakwater prior to making his bid to estimate quantities of cap stone, core stone, and blanket stone. The breakwater was constructed on a clay foundation, which the blanket and some core stone may have settled into the clay layers.

B. **Excavation:** The Contractor shall remove all cap stone, core stone, and blanket stone down to a stone of 6 inches in diameter. The Contractor shall take care not to damage the existing shoreline revetment during the demolition of the breakwater. All material removed and not scheduled for reuse shall become the property of the Contractor and shall be removed from the site as demolition progresses. Material scheduled or required for reuse by the Contract shall be stockpiled in a Contractor selected area as approved by the Engineer. Material that the Engineer does not schedule for reuse will become the property of the Contractor and shall be disposed of in a lawful manner. The disposal location shall be reported to the Engineer. The Contractor shall demonstrate complete excavation of the structure to the Engineer. The Contractor shall abide by all trench safety requirements. It shall be the responsibility of the Contractor to repair any damage to State owned equipment as a result of failure by the Contractor to fully remove all of the stone as required. All costs associated with those repairs are at full cost to the contractor.

**Part 4 Measurement and Payment:**

4.1 **Measurement:**

A. **Dredging:**

1. Measurement for “Dredging Galveston Ferry Landings, Slips No. 2 & No. 3” and “Dredging Bolivar Ferry Landings” will be per cubic yard in-place of the total amount of material removed within the required and allowable overdepth prism. The measurement shall be made by computing the volume between the bottom surface elevations, soundings and fathometer soundings of the before-dredge survey and the bottom surface shown by the fathometer soundings of survey made as soon as practicable after the work has been completed and within the limits specified. The average-end-area method will be used for the quantity calculations.

2. **Electronic Positioning:** The horizontal control points shown are the control points the Engineer will use to perform electronic surveys on the
waterway. The Engineer does not guarantee permanent access to these control points, therefore, it may be necessary for the Contractor to establish its own network of survey points from these survey points or from other U.S. Coastal and Geodetic Survey (USCGS) monuments. The Contractor shall be responsible for establishing a reference line to conduct hydrographic surveys and dredging operations if electronic positioning equipment is not used.

3. **Existing Conditions:** The drawings represent conditions existing as of the date of preparation based on available survey information. The depths and elevations shown thereon will be verified and corrected by fathometer soundings taken by the Engineer before and after dredging. Determination of quantities removed and the deductions made to determine quantities by in-place measurement to be paid for in the area specified after having once been made, will not be reopened, except on evidence of collusion, fraud or obvious error.

**B. Pelican Island Placement Site:**

1. **Placement Site Preparation:** Measurement for “Dredge Placement Site Preparation” will be LUMP SUM. No measurement for “Placement Site Preparation” will be made for the site preparation at the Pelican Island Upland Placement Site, Cell C which includes the cleaning and restoration of the weir box to a functional condition, purchase of all weir boards, purchase of required 6-millimeter thick polyethylene sheeting, seeding, and excavation of approximately 1200 linear feet of perimeter ditch as specified in the Contract and shown on the Plans.

2. **Mechanically Constructed Levee:** Measurement for “Dredge Mechanically Constructed Levee” to close the breach in the perimeter levee, shall be measured for payment by price per cubic yard of the borrow pit measurement. The total amount of material removed from the borrow area designated, shall be measured by computing the volume excavated between a pre-excavation survey of the borrow area and the last survey made before placement of hydraulic fill commences. The Contractor shall perform the before and after surveys of the borrow area at 10 foot intervals in all principal directions to adequately define the volume removed. All surveys shall be performed in the project coordinate and datum system. All field notes and raw data shall be submitted with the Contractors final cross-sections and borrow calculations.

3. **Hydraulically Constructed Levee:** Measurement for “Dredge Hydraulically Constructed Levee” will be Lump Sum for the new levee that meets specified acceptance requirements. No measurement for “Dredge Hydraulically Constructed Levee” will be made for the shaping and grading of the hydraulically constructed levee.

**C. Levee Clearing and Grubbing:**

1. Stripping of the levee foundation area and other required areas will not be measured for payment.
D. **Removal of Existing Stone Breakwater**: No measurement will be made for the removal of the existing breakwater for capstone, core stone, and blanket stone removed down to a stone of 6 inches in diameter. Material smaller than 6 inches in diameter will be measured by the cubic yard of dredged material under Item “Dredging Bolivar Ferry Landings”.

### 4.2 Payment:

A. **Mobilization and Demobilization**:

1. Mobilization and demobilization for dredge-related equipment is considered incidental to the overall project Contract Lump Sum price for Item 500 “Mobilization” and shall include the costs in connection with mobilization and demobilization of the plant necessary to perform work under the various bid items. The Contract Price shall include transportation and other costs incidental to delivery of all plant and other equipment to the general work area in condition ready for operation and, after the completion of the work, for the removal of all plant and the equipment from the work sites. Incremental payments shall be justified based on invoices or estimated costs as approved by the Engineer.

B. **Dredging**:

1. The work performed and materials furnished in accordance with this Item and measured as provided under Article Measurement will be paid for at the applicable contract unit price bid for “Dredging Galveston Ferry Landings Slips 2 & 3” and “Dredging Bolivar Ferry Landings”. This price shall be full compensation for furnishing all materials, labor, tools, equipment, and other incidentals necessary to complete the work. It shall include the cost of removal of material, transport, and placement of the material as specified herein. All weir boards necessary at the Fort San Jacinto Placement Site shall be incidental to the dredging work at the Galveston Ferry Landings.

2. **Existing Structures**: No additional compensation shall be granted to the Contractor for repair or replacement of existing structures during dredging operations as a result of the Contractor’s negligence.

3. **Partial Payments**: Monthly partial payments for “Dredging” will be based on approximate quantities determined by fathometer soundings or sweepings taken behind the dredge by the Contractor, as approved by the Engineer.

C. **Pelican Island Upland Placement Site, Cell C, Site Preparation**: The work performed and materials furnished in accordance with this Item and measured as provided under Article Measurement will be paid for at the Lump Sum price bid for Item “Dredge Placement Site Preparation.” This price shall be full compensation for cleaning and restoration of the weir box to a functional condition, purchase of all weir boards, purchase of required 6-millimeter thick polyethylene sheeting, seeding, excavation of approximately 1200 linear feet
of perimeter ditch, and other incidentals as specified in the Contract and shown on the Plans.

D. **Mechanically Constructed Levee:** The work performed and materials furnished in accordance with this Item and measured as provided under Article Measurement will be paid for at the unit price per cubic yard bid for Item “Dredge Mechanically Constructed Levee” at the Pelican Island Upland Placement site, Cell C. This price shall be full compensation for furnishing all materials, labor, tools, equipment, and other incidentals necessary to complete the work.

E. **Hydraulically Constructed Levee:** The work performed and materials furnished in accordance with this Item and measured as provided under Article Measurement will be paid for at the applicable contract unit price Lump Sum for Item “Dredge Hydraulically Constructed Levee” at the Pelican Island Upland Placement site, Cell C. This price shall be full compensation for furnishing all materials, labor, tools, equipment, and other incidentals necessary to complete all shaping and grading the levee to the minimum lines and grades and other incidental work. No partial payment will be made for this item.

F. **Levee Clearing and Grubbing:** No payment for stripping as required in this section will be made.

G. **Removal of Existing Stone Breakwater:** The work performed and materials furnished in accordance with this Item and measured as provided under Article Measurement will be paid for by the EA price bid for Item 496, “Remove Old Structure (Large) (Stone Breakwater).” This price shall be full compensation for furnishing all materials, labor, tools, equipment, and other incidentals necessary to remove the existing stone breakwater, stockpiling of the designated volume of salvaged cap stone at the location identified on the plans, and disposal of the remaining unused material.