HOUSTON SHIP CHANNEL (HSC), TEXAS
EXPANSION CHANNEL IMPROVEMENT PROJECT (ECIP)
PROJECT 11: REDFISH TO SOUTH BOATERS CUT
HSC STA 98+000 TO HSC STA 57+000

SOLICITATION NO.: W912HY-XX-X-XXXX
CONTRACT NO.: XXXXXX-XX-X-XXXX
ISSUE DATE: AUGUST 2020
VOLUME 4 OF 9
GENERAL NOTES:

1. **ALL EXISTING CONDITIONS SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES.** The contractor shall notify the Port Authority and Engineer immediately of any conflict or discrepancies.

2. **THE CONTRACTOR SHALL MAKE HIS OWN ARRANGEMENTS AND OBTAIN PERMISSION FROM APPLICABLE PROPERTY OWNERS FOR STAGING AREAS AND LOADING BARGES ON PUBLIC OR PRIVATE PROPERTY.** All costs associated with preparation and use of support facilities for this project shall be paid by the contractor. These areas shall be restored to pre-project conditions upon completion of work.

3. **THE CONTRACTOR SHALL TAKE MEASURES TO PROTECT ALL EXISTING, IMPROVEMENTS WITHIN AND ADJACENT TO THE WORK AREA.** Any damage caused by the contractor’s activities shall be replaced or repaired at the expense of the contractor and at no cost to the Port Authority. Structures that are to be protected from damage or repaired if damaged include but are not limited to fences, levee embankments, outlet structures, drainage pipes, roads, ditches, private or public ground, and other structures or improvements.

4. **THE CONTRACTOR SHALL TAKE PRECAUTIONS, SECURE EQUIPMENT AND PROTECT THE WORK AGAINST ADVERSE WEATHER CONDITIONS AND SURGE / WAKE INFLUENCES FROM PASSING VESSELS.** Provisions shall be made to access shallow areas through the use of light-loaded barges or other equipment suitable for shallower water. Excavation for access and floatation is not permitted unless granted in writing by the Port Authority.

5. **THE DREDGING PROJECT MAY BE ADJACENT TO ENVIRONMENTALLY SENSITIVE AREAS.** The contractor shall avoid / minimize impacts to these areas during the course of construction. Any damage caused by the contractor’s activities shall be restored at the expense of the contractor and at no cost to the Port Authority. The Port Authority reserves the right to suspend work at any time if impacts occur and until satisfactory corrective measures are implemented by the contractor.

6. **CONSTRUCTION EQUIPMENT SHALL NOT OPERATE ON PRIVATE PROPERTY UNLESS PERMISSION HAS BEEN ACQUIRED BY THE CONTRACTOR FROM THE LAND OWNER.**

7. **THE PROJECT IS LOCATED WITHIN THE LIMITS OF THE HOUSTON SHIP CHANNEL, WHICH IS HIGHLY UTILIZED BY MARINE TRAFFIC.** The contractor shall not stage equipment within the navigation channel nor interfere with or interrupt vessel navigation.

8. **THE CONTRACTOR SHALL REQUEST A NOTICE TO MARINERS FROM THE U.S. COAST GUARD PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES.**

9. **THE CONTRACTOR SHALL REMOVE ANY ENCOUNTERED DEBRIS AND DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.**

10. **THE LOCATIONS OF EXISTING UTILITIES AND SUBSTRUCTURES SHOWN HEREIN HAVE BEEN TAKEN FROM AVAILABLE RECORDS.** The Port Authority does not warrant the completeness or correctness of the locations of utilities and substructures. It shall be the contractor’s responsibility to identify and protect existing utilities and substructures. Should utilities, pipelines, cables or other substructures be encountered that are not identified and indicated on these plans, the Port Authority shall be notified immediately.

11. **ATTENTION IS DIRECTED TO THE SPECIFICATIONS WHERE BIDDERS ARE REQUIRED TO EXAMINE AND JUDGE AS THEIR OWN RESPONSIBILITY THE LOCATION, PHYSICAL CONDITIONS, AND SURROUNDINGS OF THE PROPOSED WORK.**

12. **THE CONTRACTOR SHALL SCHEDULE AND COORDINATE WITH THE VARIOUS COMPANIES AND AGENCIES WHO MAY BE AFFECTED BY THIS PROJECT.** The contractor shall obtain the required permits as may be required beyond the authorization provided herein or beyond the work.

13. **THE CONTRACTOR SHALL ADHERE TO ALL SAFETY CODES, REGULATIONS AND SPECIFICATIONS FOR THE DURATION OF THIS CONTRACT.**

14. **THE CONTRACTOR SHALL COMPLETE ALL WORK SHOWN ON THE DRAWINGS AND IN THE SPECIFICATIONS, UNLESS INDICATED AS NOT IN PACKAGE (N.I.P.).**
NOTE: THE HISTORICAL BORINGS SHOWN ARE APPROXIMATE. REFER TO BORING LOGS FOR FURTHER INFORMATION.

"NOT ALL HISTORICAL BORINGS ARE SHOWN. ADDITIONAL BORING LOGS FOR THOSE NOT USED IN DESIGN ARE INCLUDED BY ATTACHMENT TO THE CONTRACT SPECIFICATIONS"
NOTES:
1. ALL LEVELS SHOWN IN FEET TO MEAN LOW LOW WATER (MLLW).
2. ABBREVIATIONS:
   - RD - REQUIRED DEPTH
   - RO - REQUIRED OVER DEPTH
   - AO - ALLOWABLE OVER DEPTH

EXIST CHANNEL TEMPLATE (TYPICAL)

ELEVATION, FEET (MLLW)
DISTANCE FROM CENTERLINE, FEET

GRAPHIC SCALES
HORIZONTAL: 1" = 200'
VERTICAL: 1" = 20'

WEST EAST
RED SIDE GREEN SIDE

EAST WEST
RED SIDE GREEN SIDE

PORT OF HOUSTON
AUTHORITY

65% PRELIMINARY
HOUSTON SHIP CHANNEL (HSC)
EXPANSION CHANNEL IMPROVEMENT PROJECT (ECIP)

PROJECT 11:
REDFISH TO SOUTH BOATERS CUT
HSC STA 98+000 TO
HSC STA 57+000

DREDGE CROSS SECTIONS - 4
HSC STA 93+000 TO
HSC STA 98+000

PROJECT 11:
REDFISH TO SOUTH BOATERS CUT
HSC STA 98+000 TO
HSC STA 57+000

DREDGE CROSS SECTIONS - 4
HSC STA 93+000 TO
HSC STA 98+000

65% SUBMITTAL

65% DRAFT
TECHNICAL SPECIFICATIONS
FOR
HOUSTON SHIP CHANNEL EXPANSION CHANNEL IMPROVEMENT PROJECT
PROJECT 11: REDFISH
SEGMENT 1A & 1B: HSC STA 98+000 TO STA 57+000

Submitted by:
The Joint Venture
Texas Engineering Firm F-10788
5444 Westheimer Suite 200
Houston, Texas 77056

65% PRELIMINARY

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW AND IS NOT INTENDED TO BE USED FOR CONSTRUCTION, BIDDING, OR PERMITTING PURPOSES.

ENGINEER: ASHLEY P. JUDITH
LICENSE NO: TX# 112988
DATE: AUGUST 03, 2020

ENGINEER: CHESTER HEDDERMAN
LICENSE NO: TX# 100209
DATE: AUGUST 03, 2020
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Appendix A: Geotechnical Study – Houston Ship Channel Expansion Channel Improvement Project Harris, Chambers and Galveston Counties, Texas, Report No. HG1910092.1.1 - DATA (April 30, 2020)


Appendix C: Mag survey report (possibly only include the link for download)

Appendix D: Required Relocation of Navigation Aides Plan
1 GENERAL INFORMATION

1.1 GENERAL
Administration and performance of the work shall be subject to the General Conditions, Special Conditions, and these Technical Specifications. Should it be discovered that information within these Technical Specifications conflicts with the General Conditions and/or Special Conditions, the Port Authority and Engineer shall be notified immediately. Additional and/or supplemental requirements shown herein shall not be considered as conflicting.

1.2 PROJECT DESCRIPTION
This project consists of new work dredging of the Houston Ship Channel with disposal of new work dredge materials into the Ocean Dredged Material Disposal Site (ODMDS).

1.2.1 HOUSTON SHIP CHANNEL EXPANSION CHANNEL IMPROVEMENT PROJECT
The Houston Ship Channel Expansion Channel Improvement Project encompasses dredging of the Houston Ship Channel from approximate Station 98+000 to approximate Station 57+000, referred to as NW Dredging HSC to ODMDS. New work dredging will widen the existing 530-foot wide channel equally on each side to a new 700-foot wide channel as shown on the Plans. Additional new work dredging includes a bend easing at Station 78+844. Barge lanes will be replaced in-kind to their existing dimensions to the outside of the channel widening as shown on the Plans.

New work dredging of the HSC shall be dredged within the limits shown on the Plans. The existing 530-foot wide template was created with a 4H:1V slope (maintained at 2.5H:1V) beginning at the authorized elevation of minus 46 feet with 2 feet of advance maintenance and 2 feet of allowable overdepth. The new work template shall have a 3H:1V slope from Station 98+000 to Station 78+000 and a 4H:1V slope from Station 78+000 to Station 57+000 beginning at the required elevation of minus 48 feet, with 2 feet of required overdepth plus 1 foot of allowable overdepth. New work materials from NW Dredging HSC to ODMDS include the channel widening, bend easing, and offset of the barge lanes as shown on the Plans. New work materials are expected to be predominantly virgin materials and may consist of soft silts and muds, soft, firm, hard, lean and fat clays, fine to coarse sands, silty sands, calcareous nodules, shell, and rock as shown on the Plans. The new work material from NW Dredging HSC to ODMDS shall be dredged, transported and deposited into the ODMDS as designated on the Plans.

The work herein consists of furnishing all labor, materials, tools, equipment, plant, supplies, superintendence, insurance, incidentals, and other services necessary or required; and performing all excavation, transportation, and placement of dredged, or otherwise excavated material, into the designated placement areas to the lines and grades shown on the Plans.

1.3 REFERENCES
- HVJ Associates, Inc. Geotechnical Reports:
o Geotechnical Study – Houston Ship Channel Expansion Channel Improvement Project Harris, Chambers and Galveston Counties, Texas - Report No. HG1910092.1.1 - DATA (February 18, 2020)

- Federal, State, and local laws, rules and regulations governing the disposal of materials and wastes in navigable waters including approval of the appropriate Texas Commission on Environmental Quality for the discharge of any materials and wastes in the navigable waters within its jurisdiction and including the provisions of 33 U.S.C. 1342.
- Refuse Act (33 U.S.C. 407) (Section 12, of the River and Harbor Act of 1988)
- Federal, State and local rules and regulations governing the control of air pollutants (30 T.A.C. 116) including those governing the burning of debris or wastes (30 T.A.C 111).
- General Regulations of the Department of the Army and of the Coast Guard governing lights and day signals for vessels working on wrecks, dredges, and vessels engaged in laying cables or pipes or in submarine or bank protection operations

1.4 TECHNICAL DEFINITIONS

Contractor: The term Contractor means the independent contractor appointed by the PHA and named in the Contract agreement and is the party responsible for the work.

Demobilization: The term demobilization shall include the work in connection with demobilization of the plant and equipment utilized to perform work under the various bid items and include the cost to remove pipelines to and at the placement area (where applicable). The Contract price shall include transportation and other costs incidental for the removal of the plant and equipment from the work sites.

Engineer: The Engineer shall mean the engineer or engineers, or the firm, or firms, employed to provide professional engineering services. The Engineer is the Port Authority’s Design Consultant, for matters concerning the work as defined in the Contract Documents.

Excavation: Excavation shall mean the removal of material to the lines and grades shown in the Plans and specified in the Technical Specifications herein.

Mobilization: The term mobilization shall include the work in connection with mobilization of the plant, equipment, and personnel necessary to perform the work under various bid items and include the cost to place and handle pipelines to and at the placement area (where applicable). The Contract price will include transportation and other costs incidental to delivery of the plant and other equipment to the general work area in condition ready for operation.
Mean Lower Low Water: Mean Lower Low Water (MLLW) is the vertical tidal datum used by the USACE Southwest Galveston District. USACE provided datum conversions by reach are provided on the Plans.

New Work Dredging: The term new work dredging shall mean removal of previously undredged material within the dredging template, as shown on the Plans.

New Work Materials: New work materials are defined as predominantly virgin materials and may consist of: soft silts and muds; soft, firm, stiff, very stiff, hard, lean and fat clays; fine to coarse and loose to very dense sands; silty sands; calcareous nodules; rock; and shell; and as shown on the boring logs provided in Appendix A.

Permit: The term permit shall mean all permits obtained by the Port Authority and shall include the USACE permit and any other permits required for work, whether obtained by the Port Authority or the Contractor.

Plans: The Plans shall mean the drawings as defined in the General Conditions Section 1.21.

Port Authority: The Port of Houston Authority of Harris County, Texas is a political subdivision of the State of Texas. The terms “Port,” “Port Houston”, “Port of Houston Authority”, “PHA” and “Port Authority” are synonymous with the Port of Houston Authority of Harris County, Texas. The Port Authority is independent and not a part of the government of Harris County, Texas or the City of Houston.

Shoaled Materials: The term shoaled materials shall mean the material that accumulates over time above the previously dredged surface, consisting of mostly silts, clays, sands, and shells.

1.5 EQUIPMENT DEFINITIONS

Hopper Dredge: Hopper dredges are seagoing vessels that excavate material hydraulically and transport it to a placement site in a hopper built into the hull of the vessel.

Mechanical Dredge: Characterized by the use of some form of a bucket to excavate and raise the bottom material.

Miscellaneous Equipment: Additional equipment used to facilitate transportation and disposal of dredged material.

Transport Vessel: Barges used to transport HSC new work material to the ODMDS.

1.6 SPECIAL SCHEDULING REQUIREMENTS

1.6.1 ORDER OF WORK

The sequence of construction shall be determined by the Contractor, unless otherwise restricted by the Contract documents. The dredge locations have been divided into sections as described in Table 6-2:
HSC New Work Acceptance Sections. Work for an acceptance section must be completed in its entirety, and accepted by hydrographic surveys as described in Part 4 Subpart 4.9 before the Contractor begins work in the following acceptance section. The Contractor shall determine its means and methods for conducting the work and shall maintain a five nautical mile distance from all other dredges operating in the Houston Ship Channel. The order of work shall be in accordance with Technical Specifications Parts 6. Construction shall be continuous from start to finish with no appreciable shut down periods.

1.7 PERMITS
The Contractor shall comply with all applicable permits and/or other obligations required by law.

1.7.1 CONTRACTOR OBTAINED PERMITS
Any necessary permits not provided by the Port Authority shall be the responsibility of the Contractor as described in Part 5 ENVIRONMENTAL PROTECTION. The Contractor shall make application for and pay for any necessary permit fees, temporary or permanent utility interruption(s) and/or relocation fees, transportation, and temporary staging areas.

1.8 WORK ACCORDANCE
All work shall be accomplished in accordance with the Contract Documents, including these Technical Specifications, the Plans, appendices, and other parts of the Contract Documents. Any changes made to the Technical Specifications or appendices therein, or variances in construction from the work defined in the Contract Documents, without written authorization by the Engineer, shall become the express responsibility of the Contractor at its own risk and cost.

1.9 LOCAL CONDITIONS AND SITE PHYSICAL DATA
Information furnished in herein is for the Contractor’s review. However, it is expressly understood that the Engineer is not responsible for any interpretation or conclusion drawn by the Contractor. The Port Authority and Engineer are also not responsible for any lack of information herein pertaining to physical conditions at the site. Likewise, the Port Authority and Engineer will not be responsible for any information provided to the Contractor by any information agency or other party other than the Engineer. The Contractor shall make every effort possible to familiarize itself with and research the conditions to be expected at the site.

1.9.1 SUBSURFACE MATERIAL AND GENERAL SITE CONDITIONS
The material to be removed is composed of new work and shoaled materials that have accumulated over a period of time. Geotechnical investigations including core borings, to determine the character of materials to be removed have been obtained by the Port Authority and the results of these investigations are included with these Technical Specifications as Appendix A. The Contractor is expected to examine the Technical Specifications, Plans, and the site, and after investigation and research, decide for itself the character, quality, and quantity of the material to be dredged and the characteristics, whether surface, subsurface, or otherwise, at the existing disposal areas. The Contractor is expressly encouraged to perform its own investigations and research to determine the character of
materials and satisfy itself as to the means and methods required to perform the work herein specified. The Engineer shall be immediately notified of any site conditions that may affect the performance of the work.

1.9.2 DEBRIS
Other materials including, but not necessarily limited to, scrap rope, wire cable, scrap metal, anchors, anchor chains, timbers, snags, stumps, fiberglass, metal, piles, buoys, buoy anchors, timbers, or other rubbish or other obstructive materials encountered during dredging activities shall be disposed of in accordance with any and all applicable Federal, State, or local requirements. No separate payment shall be made for removal and disposal of debris. Magnetometer investigations have been obtained by the Port Authority and the results of these investigations are included with these Technical Specifications as Appendix B. Magnetometer data provided in Appendix B is for informational purposes only and shall not be considered as the basis of determination for the presence or non-presence of debris or other obstructions. The Contractor shall perform its own investigations and satisfy itself in determining the presence of debris or other obstructions at its sole risk and cost. No separate measurement or payment shall be made for debris removal, disposal, downtime, or damages resulting therefrom.

1.9.3 TIDAL CONDITIONS
Under ordinary conditions, the mean tidal range is approximately 1-foot and the diurnal tidal range is approximately 1.1 feet as determined by the NOAA tide station at Eagle Point, TX. The height of tide is largely dependent on the force, direction, and duration of the wind. Larger seasonal tidal events should be anticipated and expected by the Contractor.

1.9.4 MARINE CONDITIONS
Strong currents may at times exist in and adjacent to the site. In addition to tidal fluctuations and current velocities, the water at the site may at times be rough. The Contractor should familiarize itself with the daily and extreme conditions that could influence safety and work operations throughout the duration of this work. Impact and rework of partially completed work components due to marine conditions shall not be just cause for increased compensation. Information on water conditions at the site may be found on the NOAA Tides and Currents website (http://tidesandcurrents.noaa.gov) for the Eagle Point, TX tide gauge, Station ID 8771013, which is near the Project vicinity.

1.9.5 SHIP WAKE
Commercial watercraft uses all the waters in the vicinity of the areas to be dredged, both during the day and night, and effects can be observed at the dredging and disposal areas. Passage from large ship traffic can cause high ship wake waves. The Contractor shall take measures as it deems appropriate to ensure against damages to the work or itself resulting from ship wakes. Effects from ship wakes shall not be just cause for increased compensation or allowable downtime due to mechanical failure resulting from ship wakes.

Channel traffic may consist of, but not necessarily limited to, deep draft ships, tugs, tows consisting of a tug with one or more barges, small boats of various sizes, sailboats, recreational and commercial fishing vessels and ferries. The Contractor shall be mindful of channel traffic when transporting personnel,
equipment and supplies to and from the work site. A five-mile spacing between dredges in the vicinity of the HSC, Bayport Ship Channel and Barbours Cut Channel shall be considered in the sequencing plan. The Houston Ship Channel is an area of high vessel traffic and shall be taken into consideration by the Contractor in developing the dredging sequence, dredge plant configurations, laydown areas and pipeline routes (where applicable).

1.9.6 WEATHER CONDITIONS
The site may be affected by tropical storms and hurricanes primarily from, but not necessarily limited to, June through November, and by stormy and/or rainy weather, including severe thunderstorms, during any time of the year. The Contractor shall be responsible for obtaining information concerning rain, wind, and water level conditions that could influence safety and work operations. A list of publications containing climatologically and meteorological observations and data for the site is provided below. Other publications or information sources are available in addition to the following:

- Monthly climate summary provided by the National Oceanic and Atmospheric Administration (NOAA)
- National Weather Service Forecast Office

1.10 PRESERVATION OF PUBLIC AND PRIVATE PROPERTY
The Contractor shall preserve and protect the existing informational and directional signs, facilities, station markers, mile markers, mooring piles and other items which have been established along either bank of the channel within the reaches of the dredging operations specified herein except as described in Subpart 1.12.2.

Fences, roads, ditches, private or public grounds, and other structures or improvements damaged as a result of the Contractor’s operations shall be repaired or rebuilt by the Contractor at its expense. The areas used by the Contractor in laying and maintaining pipelines shall be restored to the same or better condition as existed prior to commencement of the work. All damages by or as a result of the Contractor’s operations, either to surface or subsurface structures, shall be repaired or replaced by the Contractor at its sole risk and cost.

1.11 UTILITY PIPELINES
Every effort has been made to give pertinent details on the location of utility pipelines and other facilities which may be encountered in trenching, jacking, dredging, or earthwork operations (where applicable). 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 pipelines lying herein. THE CONTRACTOR SHALL CALL THE TEXAS ONE CALL SYSTEM (811) A MINIMUM OF 48 HOURS PRIOR TO THE COMMENCEMENT OF ANY EXCAVATION (DIGGING, DREDGING, JETTING, ETC.) OR ANY DEMOLITION ACTIVITY. PIPELINE SAFETY, AND THE PROTECTION OF PIPELINES OR OTHER UTILITIES, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
1.11.1 PROTECTION OF EXISTING SERVICE LINES AND UTILITY LINES
Existing utility lines that are shown or the locations of which are made known to the Contractor prior to excavation or disposal and that are to be retained, as well as utility lines encountered during excavation operations, shall be protected from damage during construction and, if damaged, shall be repaired at the expense of the Contractor. In the event that the Contractor damages existing utility lines that are not shown or the locations of which are not known to the Contractor, report of this damage shall be made immediately to the TEXAS ONE CALL SYSTEM (811) and the Engineer. If it is determined that repairs shall be required, these repairs will be ordered in accordance with provisions of the Contract Documents.

1.12 NAVIGATION

1.12.1 OBSTRUCTION OF CHANNEL
The Port Authority will not undertake to keep the channel free from vessels or other obstructions, except to the extent of such 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. The Contractor will be required to conduct the work using a method that will obstruct navigation as little as possible, and if the Contractor’s plant does obstruct the channel and makes the passage of commercial vessels difficult or endangers them, said plant shall be promptly moved on the approach of a vessel as far as may be necessary to afford safe passage. Upon completion of the work, the Contractor shall promptly remove its plant, including ranges, buoys, piles, and other marks placed by it under this Contract.

1.12.2 TEMPORARY REMOVAL OF AIDS TO NAVIGATION
As a result of the work, existing informational and directional signs, facilities, station markers, mile markers, mooring piles, and other Aids to Navigation (ATONS) which have been established along either bank of the channel, within the reaches of the dredging operations specified herein may require relocation. The United States Coast Guard shall facilitate all ATONS removal and replacement. The Contractor shall work and coordinate with the USCG and USACE to enable a smooth operation of all ATONS relocation.

The Contractor shall contact the Port Authority and U.S. Coast Guard (USCG) at least twenty-one (21) days prior to the removal and relocation of existing aids to navigation. The Contractor shall submit a VTSA Channel Obstruction request and/or a Notice to Mariners as may be required by the USCG.

1.12.3 BRIDGE-TO-BRIDGE RADIOTELEPHONE EQUIPMENT
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). Tugs and tenders will be considered towing vessels within the meaning of the Act.
1.12.4 LOOKOUTS AND RADIO COMMUNICATIONS
When working in a federal channel, the Contractor shall have a dedicated lookout person posted in the dredge control room at all times to visually monitor the movement of vessels around the dredge plant and to perform radio communications with company workboats and to deliver passing arrangements with other commercial, fishing, and recreational vessels. The lookout shall be competent in the English language, the U.S. Coast Guard and Federal Communications Commission radio communications procedures and requirements and trained in the Vessel Bridge to Bridge Radiotelephone Act. The lookout shall maintain up to the minute information on the status of each company workboat as well as approaching vessels and will communicate this information as required to prevent collisions and shall comply with all requirements of the Houston-Galveston Vessel Traffic Service (VTS) area as outlined in Part 1 Subsection 1.12.7. Each company workboat shall check in with the lookout when arriving at the dredge and shall receive radio clearance from the lookout before departing the dredge. FAILURE TO COMPLY WITH THIS REQUIREMENT WILL BE CONSIDERED A VIOLATION OF THE SAFETY PROTOCOL ESTABLISHED HEREIN. PURSUANT TO THE DIRECTION OF THE PORT AUTHORITY, THE CONTRACTOR MAY BE REQUIRED TO CEASE OPERATIONS UNTIL THIS PROVISION IS COMPLIED WITH. ANY SUSPENSION, DELAY OR INTERRUPTION OF WORK ARISING FROM NON-COMPLIANCE OF THIS PROVISION SHALL NOT CONSTITUTE A BREACH OF THIS CONTRACT AND SHALL NOT ENTITLE THE CONTRACTOR TO ANY PRICE ADJUSTMENT UNDER THE CONTRACT CLAUSE ENTITLED TERMINATION AND SUSPENSION OR ANY OTHER MANNER UNDER THIS CONTRACT.

1.12.5 SIGNAL LIGHTS
The Contractor shall display signal lights and conduct its operations in accordance with the general regulations of the Department of the Army and the U.S. Coast Guard. These general regulations govern lights and day signals on towing vessels with tows, vessels working on wrecks, dredges, vessels engaged in laying cables or pipe, dredge pipelines, vessels of more than 65 feet in length moored or anchored in a fairway or channel, and floating plants 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 Code of Federal Regulations 81 Appendix A (International) and 33 Code of Federal Regulations 84 through 89 (inland) as applicable.

1.12.6 RANGES, GAGES, AND LINES
Ranges, buoys, and other markers needed to define the work and facilitate inspection shall be provided, set, and maintained in good order. Gages shall be established and maintained in locations observable from all dredge areas so the depth may always be determined.

1.12.7 HOUSTON-GALVESTON VESSEL TRAFFIC SERVICE AREA
The Contractor shall comply with the following requirements while operating within the Houston-Galveston Vessel Traffic Service (VTS) area.
1.12.7.1 GENERAL
When a dredge or floating plant is to be operated within the U.S. Coast Guard Houston-Galveston Vessel Traffic Service (VTS) Area the master shall furnish the Vessel Traffic Center the following report at least 30 minutes prior to beginning operations:

- Location of intended operation
- Description of intended operation including channel obstructions
- Configuration of pipelines, if any, crossing the channel
- Termination point of pipelines, if any, crossing the channel
- Time required to re-open channel or move for vessel traffic
- Operating impairments, including VHF-FM radios

1.12.7.2 REPORT CHANGES
The master of the dredge or floating plant shall immediately notify the VTC of changes to the above report and at the completion of operations.

1.12.7.3 VESSEL TRAFFIC SERVICE LOCATION
The Houston-Galveston VTS Area consists of the navigable channels between the Galveston Entrance Channel Buoy 1 and the Houston Turning Basin, Galveston Channel, Texas City Channel, BSC, BCC, the Gulf Intracoastal Waterway, and Galveston-Freeport Cutoff from mile 346 to mile 352.

1.12.7.4 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.

1.12.7.5 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.

1.12.8 DREDGE TRACKING
The Port Authority may elect to install GPS tracking units and/or cameras onboard the dredge(s). Units will be installed and maintained by the Port Authority GPS contractor. Access to the vessel shall be provided by the Dredging Contractor to allow installation, maintenance, and removal of the tracking units by the Port Authority GPS contractor. The GPS tracking units are the property of the Port Authority and will be removed by the Port Authority GPS contractor prior to dredge demobilization.
1.12.9 AUTOMATIC IDENTIFICATION SYSTEM (AIS)
A Class “A” Automatic Identification System (AIS) in accordance with the Code of Federal Regulations (CFR) title 33, CFR 164.46, as amended, is required for all dredges used on this contract.

1.13 VARIATIONS IN ESTIMATED QUANTITIES
New work dredging quantities have been determined for the Houston Ship Channel Expansion Channel Improvement Project and no significant variation in quantity is anticipated for new work dredging pay items.

On these pay items and others where the quantity of a pay item in this Contract is an estimated quantity and where the actual quantity of material within the required dredging limits varies more than 15% above or below the stated estimated quantity, within the required dredging limits. An equitable adjustment in the Contract unit price shall be made upon demand of either party. The equitable adjustment will be based upon an increase or decrease in costs due solely to the variations above 115% or below 85% of the estimated quantity within the required dredging limits. Equitable adjustments shall be coordinated between the Contractor and the Port Authority, and only executed by change order.

Prior to performing work where a quantity variation above 115% or below 85% is determined to exist, the Contractor shall notify the Engineer in writing within three days of discovering or anticipating such condition. If the quantity variation is such as to cause an increase in the time necessary for completion, the Contractor may request in writing, an extension of time, to be received by the Engineer within ten (10) days from the beginning of the delay, or within such further period as may be granted by the Port Authority before the date of final settlement of the Contract. Upon receipt of a written request for an extension, the Engineer shall ascertain the facts and make an adjustment for extending the Contract time as is justified.

1.14 UNAUTHORIZED PLACEMENT OF MATERIAL

1.14.1 MISPLACED MATERIAL
Excavated material that is deposited elsewhere than in places designated or approved will not be paid for, and the Contractor may be required to remove the misplaced excavated material and deposit it where directed by the Engineer at no cost to the Port Authority.

1.14.2 DEBRIS DISPOSAL
During the progress of the work, the Contractor shall not deposit worn out discharge pipe, wire rope, scrap metal, timbers, or other rubbish or obstructive material into the disposal area or within 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 disposed of by the Contractor at locations in accordance with any and all applicable Federal, State, or local requirements.
1.15 HOLD HARMLESS AND INDEMNIFICATION
The Engineer shall not be liable or responsible for, and the Contractor shall indemnify and hold harmless the Engineer from and against any and all claims and damages of every kind, for injury to or death of any person or persons, and from damage to or loss of property arising out of or attributed directly, or indirectly, to any work, or other activity conducted at the site, performed by the Contractor. This indemnity and hold harmless provision shall not be limited by the specification of insurance coverage required to be maintained by the Contractor. The Contractor further agrees to obtain, in writing, from its contractors, subcontractors, and consultants the same indemnity and agreement to hold harmless as stated above. This requirement is supplemental to other requirements found in the Contract Documents (see Section 11.08 of the General Conditions).

1.16 USE OF PORT AUTHORITY PREMISES AND WORK AREA CONDITIONS

1.16.1 CONTRACTOR FACILITIES
The Contractor’s field offices, staging areas, stockpile storage, and temporary buildings shall be placed in areas approved by the Port Authority. Temporary movement or relocation of Contractor facilities shall be made only on approval by the Port Authority. The Contractor shall fuel and lubricate equipment in a manner that protects against spills and evaporation, and the Contractor shall provide a berm around fuel and liquid chemical storage tanks to contain the tank contents in the event of a leak or spill. Refer to the General Conditions for further guidance.

1.16.2 SANITARY FACILITIES
Sanitary sewage services will not be furnished by the Port Authority. The Contractor shall provide and maintain in neat, sanitary condition toilets and other necessary accommodations for employees’ use to comply with the regulations of the State Department of Health or other jurisdictions.

1.16.3 SITE MAINTENANCE
Trash or debris shall not be allowed to accumulate on the site. The Contractor shall clean the entire area of any litter resulting from the Contractor’s operations daily. The Contractor shall maintain the premises as clean and presentable, as good construction practices will allow, at all times.

1.16.4 EXCLUSION OF THE PUBLIC
The Contractor will be permitted to exclude the public from the work areas in the immediate vicinity of its dredging, transporting, and disposal operations. Enforcement shall be the Contractor’s responsibility at no additional cost to the Port Authority. Should enforcement be required, it shall be coordinated with local enforcement agencies, and notification shall be provided to the Port Authority in the event of such occurrence.

1.17 FIRE PROTECTION
The Contractor shall take stringent precautions against fire. Open fires are not allowed unless approved in writing by the Port Authority.
1.18 STANDBY TIME PROVISIONS
At any time during the Contract performance period, the Port Authority may terminate the Contract for unforeseen causes. However, in lieu of terminating the Contract, the Port Authority may opt to issue a temporary “stop work order” and activate standby time provisions. The Port Authority reserves the right to activate, or not to activate, standby time provisions as it deems appropriate in accordance with the General Conditions.

1.19 ACCESS AND STAGING
The work site is accessible by waterborne transportation only. All staging areas are to be provided by the Contractor but shall at all times provide safe access and staging for all work including, but not limited to, surveying, dredging, and the transportation and disposal of dredged materials. The Contractor shall be responsible for maintaining staging and access necessary for its equipment and plant to and from the site, mooring area, and disposal area. The Contractor shall ascertain the environmental conditions that can affect the access such as climate, winds, current, waves, depths, shoaling, and scouring tendencies. The Contractor shall be responsible for providing access to the site for their employees as well as the Port Authority and/or the Engineer and other Port Authority authorized representative(s) when requested, to include daily inspection of the dredge area and disposal sites, at no additional cost to the Port Authority. The Contractor shall be responsible for obtaining all necessary permissions for use of landing areas to load and offload its crews. The Contractor shall be responsible for following any and all permit requirements or conditions regarding pipelines and pipeline routes, as well as any other permit or regulatory requirements regarding material transport or personnel transport. No separate payment shall be made for site access or staging areas.

1.19.1 CONSTRUCTION OFFICE
The Contractor shall provide for the duration of the projects, office space of not less than 480 square feet for the exclusive use of Port Authority personnel. The office shall be secured in place using tie downs capable of withstanding winds up to 75 miles per hour. The office shall have as a minimum one dedicated office space suitable for two persons; one restroom with toilet, hand sink, and towel dispenser; and one conference area. The facility shall be located as close to the Contractor’s onsite project office as possible. Windows shall be provided with interior blinds. A paved parking area for a minimum of three vehicles shall be provided. If the construction office is located at a remote site, the parking area shall be enclosed within a 6-foot chain link security type fence. The fence gate shall have a minimum opening of 16 feet. A personnel gate shall also be provided and shall have a minimum opening of 4 feet.

As a minimum, the Contractor shall provide one line to provide local 911 and long-distance service, one line for an all-in-one printer, fax, copier, and two internet connections. The Contractor shall provide one speaker phone and one all-in-one printer, fax, scanner, and copier capable of printing 11x17 paper. Paper cartridges (as required) shall be furnished for the printer. In addition, the Contractor shall provide electric power, sewer, gas, lighting, phone, and internet service, hot and cold running water, air-
conditioning, heating, bottled drinking water with electric cooler, disposable drinking cups, one exterior mud scraper, one coat rack, two 3 foot by 5 foot desks, two free standing four drawer file cabinets, eight padded chairs, one 4-foot by 8-foot conference table, three waste cans, three sets of keys to the entry doors, closets, desks, and security gate. Desks and file cabinets shall be lockable. Smoke detectors and fire extinguishers shall be provided to meet OSHA requirements. The Contractor shall also provide weekly janitorial services to include replenishing toilet paper and paper towels, and trash removal from the site. Items are to be in like-new serviceable condition and subject to approval by the Port Authority. All items listed above that are furnished by the Contractor shall become the property of the Contractor when the project is completed. This section supersedes Section 4.29 of the General Conditions.

1.20 PROTECTION OF EXISTING WATERWAYS
The Contractor shall conduct its operations in such a manner that material or other debris are not deposited in existing channels or other areas adjacent to the site. Should the Contractor, during the progress of the construction, lose, dump, throw overboard, sink, or misplace any material, plant, machinery or appliance, the Contractor shall recover and remove the same with the utmost dispatch. The Contractor shall give immediate notice to the Port Authority, with description and location of such obstructions, until the same are removed. Should the Contractor refuse, neglect, or delay compliance with the above requirements, such obstructions may be removed by the Port Authority, and the cost of such removal may be deducted from any money due or to become due to the Contractor, or may be recovered under its bond. The liability of the Contractor for the removal of a vessel wrecked or sunk without fault or negligence shall be limited to that provided in Sections 15, 19, and 20 of the Rivers and Harbors Act of March 3, 1899 (33 U.S.C. 410 et seq).

1.21 ADJACENT PROPERTY AND STRUCTURES
The Contractor is notified that construction will occur adjacent to active public recreational facilities, private property, and environmentally sensitive areas. The Contractor is hereby notified that adverse working conditions may exist, and the necessary allowances and precautions shall be made to avoid damaging public and private property and sensitive environmental resources. The Contractor shall take extreme care when dredging adjacent to structures, particularly dock piles and seawalls. Any damage to structures as a result of the Contractor’s negligence will result in suspension of dredging and require prompt repair at the Contractor’s expense as a prerequisite to the resumption to dredging. Unauthorized damage to any existing utilities, building facilities, structures, or plant life shall be repaired by the Contractor at no expense to the Port Authority.

1.22 SURFACE AND SUBSURFACE STRUCTURES AND UTILITIES WITHIN THE SITE
The Plans show the locations of all known structures pertinent to the work. The locations of surface and subsurface features shown on the Plans are not exact. Locations of underground utilities have not been field verified. The Contractor is notified that uncharted and/or incorrectly charted pipelines and/or underwater obstructions may be present within the site. Prior to commencement of work, the
Contractor shall verify in the field with a pre-dredge hazard survey the location of any known, unknown, or suspected underground utilities or other obstructions to the satisfaction of the Contractor.

The Contractor shall be responsible for verifying the locations and depths of all utility crossings and shall take precautions against damages which might result from its operations, especially the dropping of dredge spuds and/or anchors into the channel bottom, in the vicinity of utility crossings. If any damage occurs as a result of its operations, the Contractor will be required to suspend dredging until the damage is repaired to the satisfaction of the Owner. Costs of such repairs and downtime of the dredge and attendant plant shall be at the Contractor’s expense.

THE CONTRACTOR SHALL CALL THE TEXAS ONE CALL SYSTEM (811) A MINIMUM OF 48 HOURS PRIOR TO THE COMMENCEMENT OF ANY EXCAVATION (DIGGING, DREDGING, JETTING, ETC.) OR ANY DEMOLITION ACTIVITY. PIPELINE SAFETY, AND THE PROTECTION OF PIPELINES OR OTHER UTILITIES, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

The Engineer and Port Authority assumes no responsibility or liability for failure to show any or all of these utilities, structures or other obstructions on the Plans or to show them in their exact location. Failure to show and/or show correctly will not be considered sufficient basis for claims or for additional compensation for extra work in any manner whatsoever, unless the obstruction encountered is such as to necessitate substantial changes in the lines or grades, or requires the building of special work for which no provision is made. It is assumed that the Contractor has thoroughly inspected the site, is informed as to the correct location of surface and subsurface structures, and has considered and allowed for all foreseeable incidental work due to variable subsurface conditions, whether such conditions and such work are fully and properly described in the Contract Documents or not. Minor changes and variations of the work specified and shown on the drawings shall be expected by the Contractor and allowed for as incidental to the satisfactory completion of a whole and functioning work or improvement.

1.23 WEEKLY PROGRESS MEETINGS AND MINUTES
The Contractor shall attend weekly progress meetings with the Engineer at the site or an appropriate meeting place set forth by the Engineer to discuss the schedule of work, construction problems, coordination issues, or other topics that may be of mutual interest. The Contractor shall provide minutes of all weekly meetings to the Engineer within 48 hours of the meeting.

1.24 QUALITY CONTROL INSPECTIONS
The Contractor shall conduct daily quality control inspections of the construction activities for compliance with the Contract requirements and record the information as specified herein. A copy of the records of quality control inspections, as well as corrective action taken, shall be filed daily and submitted as directed. The daily quality control reports shall be submitted on an approved daily quality control report form. Required survey information and plots of the surveys shall be attached to the daily quality control reports as specified.
The Contractor shall inspect for compliance with Contract requirements and record the inspection of operations including, but not limited to the items specified within this Section. A copy of the records of the compliance inspections, tests, and corrective action taken shall be submitted with the daily quality control report (Technical Specifications Part 2 Subsection 2.6.4).

END OF SECTION
2 SUBMITTALS AND SUBMITTAL REQUIREMENTS

2.1 GENERAL

The Contractor is responsible for providing all Contractor required submittals outlined in the Contract Documents and additional submittals requested by the Engineer. The submittals listed herein are additional to other submittals required within the General Conditions of the Contract Documents. The Engineer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Units of weights and measures used on all submittals are to be the same as those used in the Contract Documents. Each submittal is to be complete and in sufficient detail to allow ready determination of compliance with Contract requirements.

2.2 SUBMITTAL PROCEDURES

All submittals shall be transmitted to the Engineer in accordance with the following:

- The number of copies of submittals required for each item shall be not less than the original and four copies, plus the number of additional copies that the Contractor desires for its own use.
- The Contractor must double-check and sign all submittals before forwarding them for review and action by the Engineer.
- The Engineer will review the submittal data. If there are no exceptions taken to the submittal, the original and three copies will be retained by the Engineer. All remaining copies will be returned to the Contractor. The Contractor must keep one copy at the site at all times.
- If further action is required by the Contractor, the Engineer will retain one copy of the submittal data and return all remaining copies to the Contractor.
- Any and all costs, direct or indirect, incurred by the Engineer in reviewing submittals in excess of two times shall be charged a minimum of $500 to the Contractor and deducted from the total price for the work. If, in the opinion of the Engineer the review of submittals becomes excessive, a fee greater than listed herein shall be charged to the Contractor on a time and materials basis.
- The Engineer’s acceptance of shop drawings and/or any aspects of the work shall not act to transfer the Contractor’s responsibility for, nor relieve the Contractor from the performance of any of the Contractor’s duties set forth in the Contract Documents.

2.3 SUBMITTALS AFTER AWARD

The items listed below are required within fourteen (14) days of Contract award.
2.3.1 SCHEDULE OF VALUES
Submit no later than fourteen (14) days within award of the Contract a schedule of values (Contract price breakdown) for each project, itemizing material and labor for each classification of work. The schedules of values shall be in accordance with the Contract Documents.

2.3.2 SAFETY PLAN
Submit no later than fourteen (14) days within award of the Contract a safety plan for each project. The safety plans shall be consistent with the requirements of the General Conditions. The plans shall additionally be in conformance with the following unless otherwise specified in the General Conditions:


* The Contractor is responsible for ensuring compliance with the latest revisions of the above referenced documents.

2.3.3 ACCIDENT PREVENTION PLAN (APP)
The Contractor shall comply with the provisions of EM 385-1-1. If the Contractor is a currently accepted participant in the Dredging Contractors of America (DCA) and United States Army Corps of Engineers (USACE) Dredging Safety Management Program (DSMP), as determined by the DCA and USACE Joint Committee, and holds a current valid Certificate of Compliance for both the Contractor Program and the Dredger(s) to be used to perform the work required under this contract, the Contractor may, in lieu of the submission of an Accident Prevention Plan (APP):
• Make available for review, upon request, the Contractor’s current Safety Management System (SMS) documentation

• Submit to the Engineer the current valid Company Certificate of Compliance for its SMS

• Submit the current dredge(s) Certificate of Compliance based on third party audit

• Submit for review and acceptance, site specific addenda to the SMS as specified in the solicitation

2.3.4 QUALITY CONTROL PLAN
Submit no later than fourteen (14) days within award of the Contract a quality control plan to ensure the work complies with the Contract Documents. Include, as a minimum, the following to cover all operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, and purchasing agents, designers of record, consultants, architect/engineers (AE), fabricators, suppliers, and purchasing agents:

• A description of the quality control organization, including a chart showing lines of authority and acknowledgment

• The names, responsibilities, and authorities of each person on the quality control organization chart

• Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors

• Reporting procedures, including a quality control report form for approval

2.3.4.1 QUALITY CONTROL DAILY REPORT FORM
A quality control daily report form, containing blanks for required information shall be developed by the Contractor for use during this Contract and approved by the Engineer. A copy of the daily quality control report form shall be submitted with the quality control plan, no later than fourteen (14) days within award of the Contract, for approval.

2.4 PRECONSTRUCTION CONFERENCE SUBMITTALS
The items listed below are required prior to the time of the preconstruction conference as described.

2.4.1 CONTACTS AND QUALIFICATIONS
The following is required at least fourteen (14) days prior to the preconstruction conference for each project:
• Name(s) and list of qualifications of the person(s) designated as Project Superintendent(s).

• List of all subcontractors and major material/equipment suppliers that the Contractor and subcontractors propose to use. This list shall include correct names, mailing addresses, email addresses, and phone numbers.

• List of names and titles of Contractor’s representatives authorized to sign contractual documents and payment requisitions.

• List of names, qualifications, and licenses of all licensed crafts required by the Contract Documents.

• List of names, qualifications, and licenses of the qualified Texas licensed Registered Professional Land Surveyor (RPLS) or Professional Engineer (PE) in charge of surveys

2.4.2 WORK PLAN AND SCHEDULE OF WORK
Fourteen (14) days prior to the preconstruction conference, the Contractor shall provide a detailed work plan for NW Dredging HSC to ODMDS including lists of equipment to be utilized, name(s) of dredge(s) to be used, estimated quantities and Schedules of Work. Equipment shall include, but not be limited to, all plant(s), vessels, vessel-tracking systems, and other equipment for each phase of work. Each schedule of work shall indicate, at a minimum, the start of work, start of excavation and disposal, construction period, and completion of all work. The schedules shall be in bar-chart form that indicates all work tasks, differentiates critical path work tasks from non-critical path tasks, and shows the beginning and ending dates for each critical and non-critical path work task.

The Contractor shall comply with the provisions described in the Technical Specifications Parts 6 pertaining to the order of work, including the anticipated progression of each component within the site.

The Project construction time is as outlined in Special Condition Part 10. The Contractor shall inform the Engineer if additional time is required. The work plan and schedule of work shall become part of the Contract and shall be incorporated into the Contract Documents.

2.4.2.1 SURVEY PLAN
For each work plan and schedule of work, the Contractor shall provide a written description of methods and equipment to be used for construction surveys as well as the appropriate quality control and quality assurance (QA/QC) procedures to be applied for this task. The Contractor shall prepare plans for hydrographic construction surveys of the dredging progress detailing the means, methods, and equipment that the Contractor proposes to use for review and approval by the Engineer. The plans shall document an approach that is appropriate for accurate hydrographic surveying in soft soils. Refer to Technical Specifications Part 4 for information regarding surveying QA/QC standards.
2.4.3 ENVIRONMENTAL PROTECTION PLAN
Fourteen (14) calendar days prior to the preconstruction conference, the Contractor shall submit in writing an environmental protection plan for each project conforming to the requirements of the General Conditions and these Technical Specifications. Approval of the Contractor’s plans will not relieve the Contractor of its responsibility for adequate and continuing control of pollutants and other environmental protection measures. The environmental protection plans shall include, but not be limited to, the following:

- Methods for protection of features to be preserved within authorized work areas. The Contractor shall prepare a listing of methods to protect resources needing protection (i.e., trees, shrubs, vines, grasses and ground cover, landscape features, air and water quality, fish and wildlife, soil, historic, archeological, and cultural resources).

- Procedures to be implemented to provide the required environmental protection and to comply with the applicable laws and regulations. The Contractor shall provide written assurance that immediate corrective action will be taken to prevent pollution of the environment due to accident, natural causes, or failure to follow the procedures set out in accordance with the environmental protection plan.

- Descriptions of the methods and measures for the prevention of oil spills (i.e., ground cover, containment, absorbent, etc.).

- Work area plans showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. The plan should include measures for marking the limit.

The environmental protection plans shall also address specific measures and information requested to be submitted in Technical Specifications Part 5, including Sections 5.3 AIR QUALITY and 5.4 FISH AND WILDLIFE RESOURCES. The Contractor shall train its personnel in the elements of the environmental protection plans.

2.4.4 SPILL CONTINGENCY PLAN
Fourteen (14) calendar days prior to the preconstruction conference, the Contractor shall provide and maintain an effective spill contingency plan, for each project, that complies with the requirements of the General Conditions Section 3.11 Spill Prevention Plan and these Technical Specifications and meets all applicable local, State, and Federal regulations, including but not limited to, the U.S. Environmental Protection Agency (EPA) Oil Pollution Regulations, 40 CODE OF FEDERAL REGULATIONS 112 and other state regulations as applicable. The plan shall not only account for the release of chemicals or petroleum products hazardous to the environment but shall also monitor the disposal of dredged materials during all operations. At a minimum, the Contractor’s spill contingency plan shall include the following:

- Have on-hand the names and telephone numbers of (1) companies having portable hydraulic dredges or vacuum pumps ready to clean any misplaced dredge material released from the
disposal area and (2) companies having silt curtains for containing any misplaced dredge material from the disposal area

- Cease dredging operations in the event of a spill
- Immediate notification of the Engineer upon the occurrence of a spill
- Submission of a clean-up plan within 24 hours to the Engineer
- Responsibility list for all clean-up operations

2.4.5 VOLATILE ORGANIC COMPOUNDS (VOC) COMPLIANCE PLAN
Contractors are required to comply with the applicable specifications of the General Conditions, as well as the local, state, and federal volatile organic compound (VOC) laws and regulations and shall have an acceptable VOC compliance plan for each project. The Contractor shall submit their VOC plans fourteen (14) days prior to the preconstruction conference. The plans shall demonstrate that the use of paints, solvents, adhesives, and cleaners comply with local VOC laws and regulations governing VOC materials, and that all required permits have been obtained or will be obtained prior to starting work involving VOCs, in the air quality district in which the work will be performed. An acceptable compliance plan shall contain, as a minimum, a listing of each materials subject to restrictions in the air quality management district in question, the rule governing its use, a description of the actions which the Contractor will take, a description of the actions which the Contractor will use to comply with the laws and regulations, and any changes in the status of compliance during the life of the Contract. Alternatively, if no materials are subject to the restrictions of the air quality management district where the work will be performed, or if there are no restrictions, the VOC compliance plan shall so state.

2.5 PRECONSTRUCTION SUBMITTALS
This section applies to the submittals required prior to commencement of the work.

2.5.1 SURVEY CONTROL CHECKS
Project control monumentation has been provided by the Engineer. The Contractor shall perform preconstruction survey control checks on the provided project control monumentation and provide the results to the Engineer. Any discrepancy from the published values shall be immediately brought to the attention of the Engineer, prior to use of the project control monumentation for work.

2.6 CONSTRUCTION SUBMITTALS AND NOTICES
This section applies to the submittals required immediately before and during construction.

2.6.1 NOTIFICATION OF INTENTION TO DREDGE

2.6.1.1 USACE
The Contractor shall notify the Galveston District Area Engineer, of the U.S. Army Corps Of Engineers, 2000 Fort Point Road, Galveston, Texas, 77550, in writing, at least ten (10) days prior to commencement
of pipeline dredging operations, the location or locations at which a dredge or dredges will be placed on the site.

2.6.1.2 PIPELINES
The Contractor shall notify and coordinate work with pipeline companies at least ten (10) days before performing any portion of the work near the pipelines in the vicinity of the site as shown.

The following pipelines as shown on the Plans are outside the dredging limits and are for information purposes only.

Table 2-1: Pipelines Near the Project Area

<table>
<thead>
<tr>
<th>OWNER</th>
<th>SIZE (IN)</th>
<th>CONTENTS</th>
<th>APPROX. CL STATION</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOLIVAR ROADS CHANNEL &amp; HOUSTON SHIP CHANNEL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EL PASO SERVICES, L.P.</td>
<td>24</td>
<td>CRUDE OIL</td>
<td>124+246.26</td>
<td>IN SERVICE</td>
</tr>
<tr>
<td>HOUSTON OIL &amp; MINERALS CORP.</td>
<td>UNKNOWN</td>
<td>NATURAL GAS</td>
<td>114+761.52</td>
<td>IN SERVICE</td>
</tr>
<tr>
<td>HOUSTON OIL &amp; MINERALS CORP.</td>
<td>UNKNOWN</td>
<td>NATURAL GAS</td>
<td>114+554.11</td>
<td>IN SERVICE</td>
</tr>
<tr>
<td>HOUSTON PIPELINE COMPANY L.P.</td>
<td>16</td>
<td>NATURAL GAS</td>
<td>112+113.76</td>
<td>ABANDONED</td>
</tr>
<tr>
<td>WILLIAMS FIELD SERVICES CO., LLC</td>
<td>16</td>
<td>NATURAL GAS</td>
<td>112+128.37</td>
<td>IN SERVICE</td>
</tr>
<tr>
<td>KINDER MORGAN TEJAS PIPELINE, L.P.</td>
<td>18</td>
<td>NATURAL GAS</td>
<td>90+406.35</td>
<td>IN SERVICE</td>
</tr>
<tr>
<td>FLORIDA GAS TRANSMISSION COMPANY, LLC</td>
<td>24</td>
<td>NATURAL GAS</td>
<td>80+969.04</td>
<td>IN SERVICE</td>
</tr>
<tr>
<td>DAVIS PETROLEUM PIPELINE LLC</td>
<td>10.75</td>
<td>NATURAL GAS</td>
<td>67+086.95</td>
<td>ABANDONED</td>
</tr>
<tr>
<td>DAVIS PETROLEUM PIPELINE LLC</td>
<td>8.63</td>
<td>NATURAL GAS</td>
<td>63+581.94</td>
<td>ABANDONED</td>
</tr>
<tr>
<td>LAYTON ENERGY, INC.</td>
<td>10.75</td>
<td>NATURAL GAS</td>
<td>55+128.76</td>
<td>ABANDONED</td>
</tr>
<tr>
<td>DAVIS PETROLEUM PIPELINE LLC</td>
<td>10.75</td>
<td>NATURAL GAS FWS</td>
<td>18+600.56</td>
<td>ABANDONED</td>
</tr>
<tr>
<td>ENTERPRISE PRODUCTS OPERATING LLC</td>
<td>24</td>
<td>ETHANE</td>
<td>01+691.07</td>
<td>IN SERVICE</td>
</tr>
<tr>
<td>BAYPORT SHIP CHANNEL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRAXAIR INC.</td>
<td>10.75</td>
<td>HYDROGEN</td>
<td>120+76.63</td>
<td>IN SERVICE</td>
</tr>
</tbody>
</table>


THE FOLLOWING IS FURNISHED FOR INFORMATION PURPOSES FOR VERIFYING PIPELINE OWNERSHIPS:
2.6.2 NOTIFICATION PRIOR TO COMMENCEMENT OF SURVEYING FOR MEASUREMENT AND PAYMENT AND FINAL ACCEPTANCE

The Port Authority shall conduct all BD, interim AD surveys and final acceptance surveys for measurement and payment and acceptance within the dredge areas. The Contractor shall provide five days’ (5 days’) advance notice of its intent to request a final acceptance survey.

The Contractor shall conduct all other surveys as outlined in Technical Specifications Part 4. The Contractor shall notify the Engineer in writing at least three (3) days prior to the commencement of surveying activities for measurement and payment so that the Engineer may have the opportunity to accompany the survey crew and witness the surveying activities. Surveys for interim measurement and payment shall be conducted in the presence of the Engineer.

2.6.3 PRE-DREDGE HAZARD SURVEY

The Contractor shall submit the results of their pre-dredge hazard survey (see Technical Specifications Part 4 Subpart 4.8) to the Engineer before commencement of work. Submittals shall include hard copy plan-view drawings as well as electronic copies of the drawings (in both .DWG and .PDF format), all field notes, and the final data set. Electronic submittals shall be provided on CD or DVD.

All survey data shall be referenced to the project datum as shown in the Technical Specifications and Plans. The pre-dredge hazard survey plots shall be signed and sealed by a qualified Texas licensed RPLS or PE and shall legibly and clearly display the following information:

- Project name
- Contractor’s name
- RPLS or PE seal, signature, and business affiliation
- Date(s) surveys were performed
- Layout of work including locations and descriptions of survey control
- Vertical and horizontal datums
- Sheet names and numbers
- Drawing scale(s)
- Possible anomalies and/or possible pipelines or utilities

Results of the pre-dredge hazard survey shall include a summary of findings, interpretation of any located anomalies and considerations for dredging, staging and anchoring of equipment.
2.6.4  DAILY QUALITY CONTROL REPORTS

The Contractor shall supply daily quality control reports to document construction progress and ensure compliance with Contract Documents. The daily quality control reports shall start on the first day of mobilization and end on the last day of demobilization and shall be furnished to the Engineer by 2:00 PM the following day. The daily quality control report shall be filled out every day, regardless of whether any portion of the work is accomplished and regardless of whether requested by the Engineer.

All compliance and quality control inspections will be recorded on the daily quality control reports for each project including, but not limited to, the specific items required in each technical section of the Contract Documents. Daily quality control reports shall include a description of the work completed each day including, but not limited to, the operating hours of equipment and personnel, estimated quantity of material dredged and placed, surveys conducted, water quality tests conducted (if required), weather observed, times and reasons for work stoppages and/or delays, any permit related issues or problems in compliance with the permit or other laws, corrective actions taken, and personnel and visitors on site. Copies of the dredge logs and fueling and maintenance logs for the dredge shall be included with the daily quality control report. Additional components of the daily quality control report are described in the following subsections.

The daily quality control report shall be in the approved format (see Technical Specifications Part 2 Subsection 2.3.4.1).

Failure to provide daily quality control reports to the Engineer shall result in delay of payments to the Contractor until the daily quality control reports are received.

2.6.4.1 REPORT OF ENVIRONMENTAL ISSUES

The Contractor shall submit, as specified, logs and final summary report of sightings and incidents with endangered species and other environmental issues. Environmental issues shall be submitted with the daily quality control report.

2.6.4.2 MATERIAL TRANSPORTATION AND DISPOSAL FEES

Logs or records, including receipts or tickets, for material transportation, disposal fees, and the like shall be provided with the daily quality control report.

2.6.4.3 MONITORING OF DISPOSAL OPERATIONS

The Contractor shall adequately inspect disposal operations in the disposal area(s) weekly to reduce the possibility of accidental mounding, breaching or spillage of dredged materials outside of the ODMDS as described in Part 4 Subpart 4.10.

2.6.4.4 SUBMITTAL OF REPORTS

Daily quality control reports shall be submitted in both hard copy and electronic form as directed.
2.6.5 SURVEY SUBMITTALS
The Contractor shall provide daily to the Engineer, all survey data collected by the Contractor during its performance of the work including daily dredging surveys, volumes placed and retained (as part of the daily quality control report), and survey plots. Surveys shall be conducted in accordance with Part 4 of the Technical Specifications. In addition, the Contractor shall furnish the copies of all field notes and all other records relating to the survey or to the layout of the work to the Engineer. The Contractor shall retain copies of all such material furnished to the Engineer. Survey submittals shall be submitted electronically in accordance with these Technical Specifications.

2.6.5.1 SURVEY PLOTS
All surveys shall be in the form of plan‐view and cross‐section plots every 50 feet unless stated otherwise within the Contract Documents. 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. Plots shall be prepared in AutoCAD (no later than Version 2017) software. All survey data shall be referenced to the Project datum as shown in the Technical Specifications and Plans. All plots shall legibly and clearly display the following information:

- Project name
- Name of party responsible for survey
  - Surveys submitted by the Contractor shall have the Contractor’s name displayed.
  - Surveys by the Port Authority shall have the name of the responsible Engineer or Surveyor displayed in addition to the Port Authority.
- RPLS or PE seal, signature, and business affiliation
- Date(s) surveys were performed
- Layout of work including locations and descriptions of survey control
- Vertical and horizontal datums
- Sheet names and numbers
- Drawing scale(s)

All survey plots shall comprise a well‐organized, stand‐alone set of drawings that do not include any outdated or superseded information that may have been previously submitted. Plots shall include the following:

- Plan sheets clearly documenting locations, limits, and dimensions of completed work and locations where cross sections were taken.
• Cross-sections providing an overlay of initial and final survey transects superimposed with specified templates and tolerances. Drawing scales shall be such that the cross sections and templates are clearly discernible.

• As work progresses, plots documenting completed work shall be submitted with requests for progress payments. In addition, upon completion of all work, a final, complete set of survey plots shall be submitted to document “as-built” conditions of the work. This final submittal shall be a comprehensive, stand-alone set of drawings, not an assembly of individual drawings that were previously submitted with progress pay requests.

2.6.5.2 ELECTRONIC SURVEY SUBMITTALS ON CD OR DVD

In addition to plots, all survey transmittals shall include digital data on labeled CD or DVD. Electronic submittal via email shall be allowed subject to approval by the Engineer. Digital data shall include the following:

• A submittal log documenting surveys submitted to date with descriptors for survey dates and locations
• Survey plots in AutoCAD format
• Survey plots in PDF format
• ASCII files containing northing, easting, elevation, and descriptor for each survey point both raw and corrected data points
• All survey field notes

2.7 POST CONSTRUCTION SUBMITTALS AND NOTICES

2.7.1 RECORD DRAWINGS

The Contractor shall maintain, on a separate set of the Plans, a record of all changes made during construction. The Contractor shall be responsible for keeping these records and neatly noting with colored pencil or ink all changes. These “Record Drawings” shall be turned over to the Engineer at the completion of the project. Final payment will not be made until “Record Drawings” have been received and accepted by the Engineer.

2.7.2 FINAL SUBMITTALS

At the time of Contractor’s request for final acceptance, the Contractor shall provide to the Engineer the following material, which the Contractor shall have accumulated and retained during the course of work:

• Final “as-built” construction drawing showing the construction AD surveys of the channels and final post dredge survey of the ODMDS.
• One set of all Project submittals and all equipment and material warranties/guarantees as provided by all appropriate suppliers or manufacturers.

• One set of “Record Drawings” showing all revisions to the original Contract Documents. Drawings shall also show routing of underground outside utilities and conduits with actual dimensions from buildings or other known landmarks where applicable.

• Any and all other documents, keys, manuals, etc. required by the Contract Documents.

2.7.3 APPLICATION FOR FINAL PAYMENT
After the Contractor has completed corrections as mutually agreeable to the Engineer and Contractor and has delivered any required daily quality control reports, hydrographic surveys, water quality reports (if required), data requests, guarantees, bonds, certificates of inspection, marked-up record documents, or other documents as required, and has completed demobilization, the Contractor may submit the application for final payment to the Engineer for submittal to the Port Authority.

END OF SECTION
3 MEASUREMENT AND PAYMENT
The following sections encompass the bid items required for the work covered by the Contract price.

3.1 LUMP SUM PAYMENT ITEMS

3.1.1 MOBILIZATION AND DEMOBILIZATION

3.1.1.1 GENERAL
Mobilization and demobilization 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 the plant and other equipment to the general work area in condition ready for operations and, after the completion of the work, for removal of the plant and equipment from the work sites.

The Port Authority may require the Contractor to furnish cost data to justify this portion of the bid if the Port Authority believes that the Contractor’s bid for this item does not bear a reasonable relationship to the cost of the work in this Contract. Failure to justify such price to the satisfaction of the Port Authority will result in a payment determined by the Port Authority.

3.1.1.2 MEASUREMENT
This shall not be measured for payment.

3.1.1.3 PAYMENT
Payment for mobilization and demobilization shall be made in accordance with Section 9 Payment for Mobilization and Demobilization of the Special Conditions.

3.2 UNIT PRICE PAYMENT ITEMS

3.2.1 NEW WORK DREDGING – HSC STATIONS 98+000 TO 57+000 TO ODMDS

3.2.1.1 GENERAL
This item shall mean the Contract unit price for new work dredging between HSC Stations 98+000 to 57+000 (channel widening) and replacement of the existing barge lanes outside the channel as shown on the Plans, and shall include the removal and placement of the material as specified in Part 6 of the Technical Specifications.

3.2.1.2 MEASUREMENT
This item shall be measured for payment by cubic yard of in-place material removed within the lines and grades of the prescribed templates as shown on the Plans and measured by BD and AD survey comparison in accordance with Part 4 of the Technical Specifications. Channel dredging will be measured by reaches in accordance with Table 6-2: HSC New Work Acceptance Sections Table 6-2:.
3.2.1.3 PAYMENT

Payment shall be made at the Contract unit price. Progress payments shall be made in accordance with the Special Conditions based upon actual quantity of work performed less 5% retainage by the Port Authority per monthly estimate for Contract payment until final acceptance.

END OF SECTION
4 SURVEYING

4.1 SCOPE OF WORK

The Port Authority shall conduct BD, interim AD, and final acceptance surveys for measurement and payment and acceptance within the dredge areas. The data derived from dredging surveys shall be used in computing the quantities of work performed and the actual construction completed and in place. The Port Authority shall also conduct the surveys for any periods for which dredging progress payments are requested and shall make the computations based on these surveys to determine percentages of completion. All dredging quantities shall be calculated from average-end-area volumes determined from the surveys. All raw survey data and edited/processed binned data used for purposes of acceptance and dredging quantity computations shall be available to the Contractor upon request.

In addition, the Contractor shall conduct its own daily construction surveying required in conjunction with the work. The Contractor shall notify the Engineer a minimum of three (3) days prior to performing surveys for interim measurement and payment so that the Engineer may be present during surveys. Surveys for interim measurement and payment shall be conducted in the presence of the Engineer. Promptly upon completing a survey, the Contractor shall furnish copies of all field notes and all other records relating to the survey or to the layout of the work to the Engineer. The Contractor shall retain copies of all such material furnished to the Engineer.

The Port Authority reserves the right to use the Contractor’s Interim AD Surveys as the Final Acceptance Survey, subject to all requirements and stipulations described herein, as applicable.

4.2 REFERENCES

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

U.S. Army Corps of Engineers Publications:

- EM 1110-2-1003 Hydrographic Surveying
- EM 1110-1-1003 NAVSTAR Global Positioning System Surveys
- EM 1110-1-1005 Engineering and Design: Control and Topographic Surveying

4.3 QUALITY ASSURANCE/QUALITY CONTROL STANDARDS

Surveys shall follow the quality assurance/quality control standards and methods set forth in EM 1110-2-1003, EM 1110-1-1003, EM 1110-1-1005, and these Technical Specifications.

4.3.1 TEXAS LICENSED REGISTERED PROFESSIONAL LAND SURVEYOR OR ENGINEER

Surveys provided and conducted by the Contractor for consideration of acceptance or payment shall be signed and sealed by a qualified Texas licensed RPLS or PE and provided in the format specified in
4.3.2 REAL TIME KINEMATIC GLOBAL POSITIONING SYSTEMS

Hydrographic surveys shall be conducted using RTK GPS and the horizontal and vertical control shown on the Plans.

4.4 PROJECT DATUM

The Project vertical datum shall be referenced to Mean Lower Low Water (MLLW). Datum relationships between MLLW and geodetic datums vary between the work areas and are shown on the Plans. Horizontal positions shall be referenced to NAD83 U.S. State Plane Texas South Central Zone (4204) and shall be U.S. survey feet.

4.5 SURVEY CONTROL

The Contractor shall use the survey control shown on the Plans. The Contractor’s RTK GPS base station shall be located less than 10 kilometers from the location(s) of work. The Port Authority shall have the option to utilize the Contractor’s RTK GPS base station for all channel hydrographic surveys and other surveys in relation to the work, as applicable.

4.6 SURVEY ACCURACY

Table 4-1: Survey Accuracies

<table>
<thead>
<tr>
<th>Type of Survey</th>
<th>Minimum Horizontal Accuracy for All Survey Equipment Within (±) 0.2 feet</th>
<th>Minimum Vertical Accuracy for All Survey Equipment Within (±) 0.1 foot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Survey</td>
<td>&lt; 0.2 foot</td>
<td>&lt; 0.1 foot</td>
</tr>
<tr>
<td>Hydrographic</td>
<td>&lt; 0.2 foot</td>
<td>&lt; 0.1 foot</td>
</tr>
</tbody>
</table>

Prior to commencing surveying activities, the Contractor shall provide the name of the qualified RPLS or PE to be used on the project. If PE is used for the survey work, the engineer shall have documented experience and responsible charge of surveys of the same type being performed under this Contract. The Engineer reserves the right to approve or disapprove the Contractor’s surveyor or engineer.
4.7 LAYOUT OF WORK
All baselines, temporary bench marks, and survey control shall be established and maintained by the Contractor for the duration of work. The Contractor shall also be responsible for all measurements that may be required for the execution of the work to the lines and grades specified in the Contract Documents. If such marks are destroyed by the Contractor through the Contractor’s negligence prior to their authorized removal, they shall be replaced by the Contractor at its own expense.

Temporary bench marks and controls established by the Contractor to layout the work and to perform the surveys shall be verified by Real Time Kinematic Global Positioning Systems on a weekly basis, at a minimum. Ground control and temporary benchmarks established by the Contractor shall be in conformance with Corps of Engineers EM 1110-1-1002.

The Contractor shall perform its own daily construction surveying as required to complete the work in this Contract to the required lines and grades shown in the Plans. The Contractor shall lay out its work from the gages, coordinates, distances, stationing, ranges, and control shown in the Plans, and shall be responsible for the measurements in connection therewith. The Contractor shall furnish, at its expense, stakes, templates, platforms, equipment, range markers, and labor as may be required to lay out any part of the work. The Contractor shall be responsible for executing the work to the lines and grades that may be established or indicated by the Engineer. The Contractor shall also be responsible for maintaining and preserving the stakes and other marks established by the Engineer until authorized to remove them. If these marks are destroyed by the Contractor or through its negligence before their removal is authorized, they may be replaced by the Engineer at its discretion. The expense of replacement will be deducted from the amounts due or to become due, to the Contractor.

4.8 PRE-DREDGE HAZARD SURVEYS
Prior to commencing dredging or staging of equipment, the Contractor shall conduct a magnetometer and sidescan survey over the entire area to be dredged and Contractor proposed equipment staging and laydown areas. Pre-dredge hazard surveys shall be at the Contractor’s expense. Planned scope of the pre-dredge hazard survey shall be included in the Survey Plan.

The Contractor shall issue copies of the pre-dredge hazard surveys to the Engineer in accordance with Part 2 Subsection 2.6.3 of these Technical Specifications.

Survey deliverables for the pre-dredge hazard survey must be signed and sealed by a RPLS or PE licensed in the State of Texas.

4.9 CHANNEL HYDROGRAPHIC SURVEYS
Before dredge, interim AD, and final acceptance hydrographic surveys of the dredge limits will be conducted by the Port Authority. Refer to the table below for a general summary of the surveys.
Hydrographic surveys to determine acceptance and to calculate the quantity of material removed under this Contract will be accomplished with the use of a survey vessel having an automated acquisition system. Horizontal positions and vertical elevations will be determined by the use of an inertially-aided RTK Global Positioning System providing accurate attitude, heading, heave, position, and velocity data and which is referenced to project control. Soundings will be obtained by using a multibeam echosounder system operating nominally at 240 kHz. In order to ensure ensonification of all bottom features, 200% bottom coverage will be obtained during all surveys conducted on behalf of the Port Authority. Position and depth data will be collected using Hypack Hysweep software, stored digitally, and subsequently processed for map preparation and quantity computations. Multibeam survey data will be binned to a 3 by 3 foot cell using the “average depth” of all depths within the cell as the representative cell depth. The horizontal location of the representative cell depth will be the cell center or centroid. Surveys will be performed in accordance with these Technical Specifications and EM 1110-2-1003.

Table 4-2: Summary of Channel Surveys

<table>
<thead>
<tr>
<th>Survey</th>
<th>Intended Purpose</th>
<th>Survey Schedule</th>
<th>Completed By</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Dredge Hazard Survey</td>
<td>To identify known, unknown or suspected utilities or obstructions</td>
<td>Prior to commencement of work</td>
<td>Contractor</td>
</tr>
<tr>
<td>BD Surveys</td>
<td>To verify existing conditions and document pre-dredging grades and volumes</td>
<td>Prior to commencement of work</td>
<td>Port Authority</td>
</tr>
<tr>
<td>Interim Surveys</td>
<td>Channel surveys will be periodically conducted by the Contractor to measure its own contract progress and compliance</td>
<td>Daily</td>
<td>Contractor</td>
</tr>
<tr>
<td>Interim AD Surveys</td>
<td>Channel interim AD surveys will be performed periodically to monitor dredging and to determine acceptance of new work dredge areas. Determination of the percentage completion/actual quantity of work performed for progress payments shall be made by the Engineer</td>
<td>Approximately once a week</td>
<td>Port Authority</td>
</tr>
<tr>
<td>Final Acceptance Survey</td>
<td>To document final dredging locations/depths and to verify that no dredging or placement has occurred outside of specified limits, and that the dredging template has been dredged to the lines and grades required</td>
<td>Upon completion of dredging prior to final payment</td>
<td>Port Authority</td>
</tr>
</tbody>
</table>
4.9.1 BD SURVEYS
An initial BD survey shall be performed over the entire dredge limits prior to commencement of dredging. The Port Authority shall be notified, in writing, twenty-one (21) days in advance of the Contractor’s intent to commence dredging so that a before dredge (BD) survey can be conducted by the Engineer. Results of the BD survey shall be provided to the Contractor at least seven (7) days prior to commencement of dredging.

4.9.2 INTERIM SURVEYS
Interim surveys shall be performed periodically by the Contractor to monitor dredging progress and compliance. Interim surveys shall be used by the Contractor to assist in the required daily reports in accordance with Part 2 Subpart 2.6.

4.9.3 INTERIM AD SURVEYS
Interim AD surveys shall be performed periodically by the Port Authority to monitor dredging progress and to determine acceptance of new work dredge areas. Interim AD surveys will be used by the Engineer to determine percentage completion/actual quantity of work performed for progress payment purposes. Interim AD surveys will be performed by the Port Authority approximately once a week.

4.9.4 FINAL ACCEPTANCE SURVEYS
Upon completion of all new work, a final AD survey shall be performed over the entire dredge limits to verify that the dredging template has been dredged to the lines and grades required. The Contractor shall request that the Port Authority perform a final acceptance survey when the dredging is completed. The Contractor shall provide (5) five days’ advance notice of its intent to request a final acceptance survey.

If any shoals, lumps, or other lack of Contract depth be disclosed by this examination, the Contractor will be required to remove same at its sole cost and expense, but if the bottom is soft and the shoal areas are small and form no material obstruction to navigation, the removal of such shoal may be waived at the discretion of the Port Authority. The Contractor will be notified when soundings are to be made. When the area is found to be in a satisfactory condition by the Port Authority, it will be finally accepted. Should the Port Authority be unable to accomplish a required survey because the area is not cleared of Contractor equipment, or should re-survey be necessary because of incomplete work, the cost of the survey party and equipment for each additional survey day required shall be chargeable to the Contractor at the rate of $5,000 per day, in addition to any liquidated damages that may be imposed. 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.
4.10 ODMDS MONITOR SURVEYS
To evaluate the impact of the placement of dredged material on the marine environment, perform hydrographic surveys of ODMDS before and after completion of dredged material placement operations within the ODMDS as referenced in paragraph 3.2 of the Site Management and Monitoring Plan (SMMP). The surveys are to consist of transects perpendicular to the Channel taken at 500-foot intervals and extending 500 feet beyond the ODMDS zone limits. Plots are to be made of these surveys showing the change in elevation between the before and the after-placement surveys. In addition, profiles are to be obtained along the ODMDS limit boundary. ODMDS monitor surveys are to be submitted in ASCII XYZ format promptly upon completion and are to be approved.

Refer to the table below for a general summary of the surveys.

Table 4-3: Summary of Placement Area Surveys

<table>
<thead>
<tr>
<th>Survey</th>
<th>Intended Purpose</th>
<th>Survey Schedule</th>
<th>Completed By</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-dredge Survey*</td>
<td>To verify the existing condition prior to commencement of disposal operations</td>
<td>Prior to commencement of disposal operations</td>
<td>Contractor</td>
</tr>
<tr>
<td>Interim Disposal Surveys</td>
<td>To monitor for mounding to ensure a navigation hazard is not produced</td>
<td>Weekly</td>
<td>Contractor</td>
</tr>
<tr>
<td>Post-dredge Survey*</td>
<td>To provide for final acceptance of the work</td>
<td>Upon completion of disposal operations</td>
<td>Contractor</td>
</tr>
</tbody>
</table>

* Survey deliverables for the pre-dredge survey and post-dredge survey must be signed and sealed by a qualified RPLS or PE in the State of Texas

4.10.1 PRE-DREDGE SURVEY
Prior to performing any work at the site, the Contractor shall perform a pre-dredge survey of the disposal area. The limits of the survey shall include all disposal zones to be used during the contract, including the 500-foot buffer zone on the outer boundary of the disposal zone(s) and 500 feet outside of the Galveston ODMDS boundary. The Contractor shall notify the Engineer a minimum of (3) three days prior to conducting the pre-dredge survey, so that the Engineer may witness the survey. Promptly upon completion of the survey, the Contractor shall provide all required survey submittals to the Engineer.

4.10.2 INTERIM DISPOSAL SURVEYS
During the course of dredging operations the Contractor shall perform at minimum, weekly hydrographic disposal surveys to monitor placement in the disposal area. Interim disposal surveys will be used to reduce the possibility of accidental mounding, breaching or spillage of dredged material outside of the ODMDS boundary.
The survey deliverables, including volumes placed and retained, shall be submitted with the daily quality control report.

4.10.3 POST-DREDGE SURVEY
The Contractor shall conduct the survey for final acceptance of the ODMDS. The limits of the survey shall cover the entire limits of the pre-dredge survey.

The Contractor shall provide (5) five days’ advance notice to the Engineer of its intent to perform the Post-Dredge Survey. Material found to be deposited beyond the discharge limits are to be removed by the Contractor at no additional cost to the Government.

When the area is found to be in a satisfactory condition by the Port Authority, it will be finally accepted. The Engineer reserves the right to perform check surveys during any phase of dredging. If discrepancies are found between the Contractor’s surveys and the surveys performed by the Engineer, the surveys performed by the Engineer shall govern.

END OF SECTION
5 ENVIRONMENTAL PROTECTION

5.1 GENERAL REQUIREMENTS

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. The Contractor shall confine its activities to areas defined by the Technical Specifications and Plans. Environmental protection shall be as stated in the following subparagraphs.

5.1.1 CONSTRUCTION AUTHORITY

The Contractor shall comply with all provisions contained in the permits. Where dimensions or configurations conflict between the Contract Documents and the permit drawings, the dimensions or configurations shown on the Contract Documents shall govern. If as defined in the permits, any laws, rules, regulations or ordinances conflict with the Contract Documents, then such laws, rules, regulations, or ordinances shall govern instead of the Contract Documents, except in such cases where the Contract Documents exceed them in quality of materials or labor, then the Contract Documents shall be followed. Any conflicts between the permit and the Contract Documents shall be immediately brought to the attention of the Engineer prior to the commencement of work. It shall be expressly understood that the Port and Engineer shall not be responsible for such conflicts.

5.1.2 PROTECTION OF LAND RESOURCES

Prior to the beginning of construction, the Contractor shall identify the land resources to be preserved within the Contractor's work area. The Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, top soil, and land forms without special direction from the Port Authority. Ropes, cables, or guys shall not be fastened to or attached to trees for anchorage unless specifically authorized. Where such special emergency use is permitted, the Contractor shall provide effective protection for land and vegetation resources as follows. Trees, shrubs, vines, grasses, land forms, and other landscape features identified by the Port Authority to be preserved for removal by others shall be clearly identified by marking, fencing, or wrapping with boards, or other approved techniques.

The Contractor shall clean up areas used for construction, including staging areas, on a regular basis.

The Contractor shall restore landscape features damaged or destroyed during construction operations outside the limits of the approved work areas. Restoration shall be in accordance with the Plan submitted for approval. This work will be accomplished at the Contractor's expense.

5.1.3 LOCATION OF FIELD OFFICES, STORAGE, AND OTHER CONTRACTOR FACILITIES

The Contractor's field offices, staging areas, stockpile storage, and temporary buildings shall be placed in approved areas. Temporary movement or relocation of Contractor facilities shall be made only on approval.

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5.1.4 TEMPORARY EXCAVATIONS AND EMBANKMENTS
Temporary excavations and embankments for plant or work areas shall be controlled to protect adjacent areas from despoilment.

5.1.5 PLACEMENT OF SOLID WASTES
Solid wastes, excluding clearing debris, shall be placed in containers which are emptied on a regular schedule. Handling and disposal shall be conducted to prevent contamination.

5.1.6 PLACEMENT OF SOLID WASTE BY REMOVAL FROM PORT AUTHORITY PROPERTY
The Contractor shall transport solid waste off Port Authority property and dispose it in compliance with federal, state, and local requirements for solid waste placement.

5.1.7 PLACEMENT OF DISCARDED MATERIALS
Discarded materials, other than those which can be included in the solid waste category, will be handled as directed.

5.1.8 SANITATION FACILITIES
The Contractor shall provide and operate sanitation facilities that will adequately treat or dispose sanitary wastes in conformance with Federal, State, and local health regulations.

5.1.9 MAINTENANCE OF POLLUTION CONTROL FACILITIES
The Contractor shall maintain constructed facilities and portable pollution control devices for the duration of the contract or for that length of time construction activities create the particular pollutant.

5.2 TURBIDITY AND WATER QUALITY
The Contractor shall conduct its dredging and disposal operations in a manner to minimize turbidity and shall conform to all water sampling and water quality standards prescribed herein and by the permit requirements. Plant downtime to meet the water quality standards, if required, will be at no added cost to the Port Authority or a basis for time extension.

5.3 AIR QUALITY
5.3.1 GENERAL REQUIREMENTS
The Contractor shall keep construction activities under surveillance, management, and control to minimize pollution of air resources. Activities, equipment, processes, and work operated or performed by the Contractor in accomplishing the specified construction shall be in strict accordance with the State of Texas Clean Air Act implemented in 1967, and the Federal emission and performance laws and standards. Ambient Air Quality Standards set by the Environmental Protection Agency shall be maintained for the construction operations and activities specified herein. The measures below shall be implemented to control air pollution by the construction activities included in the contract. The
5.3.1.1 **PARTICULATES**
Dust particles, aerosols, and gaseous byproducts from construction activities, processing and preparation of materials, such as from asphaltic batch plants, shall be constantly controlled, including weekends, holidays, and hours when work is not in progress.

5.3.1.2 **HYDROCARBONS AND CARBON MONOXIDE EMISSIONS**
Hydrocarbon and carbon monoxide emissions from equipment shall be controlled to Federal and State allowable limits, and in accordance with the applicable engine emission standards.

5.3.1.3 **ODORS**
Odors shall be constantly controlled for construction activities, processing, and preparation of materials.

5.3.2 **COMMITMENTS FOR GENERAL CONFORMITY**
As part of its commitments under the Federal permitting process and General Conformity Rules related to air quality, the PHA has identified several measures it will implement or require during the procurement of services under this solicitation.

- The Contractor must assess whether it is eligible to apply for Texas Emission Reduction Plan (TERP) grants related to upgrades of equipment for the reduction of emissions, and whether there is equipment within its fleets that can take advantage of upgrade or replacement under this program. This is not a requirement to apply for the program and secure a grant before award. It is only a requirement to verify eligibility and whether advantage of the program can be taken and is meant as a means of encouragement to become familiar with and use the program. The following provides where basic information on TERP can be found:
  - TERP has a variety of programs addressing various types of mobile and stationary emissions sources, described at the following website:
  - [http://www.tceq.texas.gov/airquality/terp](http://www.tceq.texas.gov/airquality/terp)
  - The specific program anticipated to be most related to Contractors performing work under this solicitation is the Emissions Reduction Incentive Grants (ERIG), which addresses several categories of sources including non-road equipment (e.g. construction equipment), and marine vessels. Links for information on this program are available through the website listed above.
  - Lists of projects awarded grant funding for the last grant cycle are available at the website listed above for your information

- Proof of assessment will consist of a one page or less description of the following information:
  - What TERP programs the Contractor reviewed for eligibility
o A description of the types of current equipment (e.g. disposal scow, dredge, tender, barge etc.) the Contractor anticipates can be eligible for upgrade or replacement based on the requirements of the program.

o If no equipment is identified as potentially eligible, describe reasons why, such as equipment is too new or already meets highest current emissions standards, all equipment is sub-contracted or rented etc.

- The Contractor shall exercise air quality best management practices as much as is practicable, including the following:
  
  o Coordinate and stage support and auxiliary equipment (tugs, tenders, etc.) that will work alongside dredges to minimize idling
  
  o Inspect and maintain seals to hatches, filling ports, etc. used for fuel storage and refueling.
  
  o Ensure engine turbochargers are properly maintained to prevent fouling, speed drop, and temperature drops
  
  o Conduct any soot blowing necessary to prevent exhaust stack buildup away from shore if possible.
  
  o Consider the use of lower engine speeds or “slow steaming” if feasible to reduce fuel consumption
  
  o Conduct any required clearing, grubbing, cutting of vegetation under moist or wet conditions to minimize particulate and dust generation.

- The Contractor shall use ultra-low-sulfur diesel (ULSD) fuel in marine vessels where technically and logistically feasible. Marine diesel fuel already must meet the ULSD fuel standard of 15 parts-per-million (ppm) sulfur content and is being phased in within the region. The Contractor shall locate vendors and determine whether ULSD is available and logistically feasible to use for its vessels, whether owned or rented. The Contractor shall identify whether vessels proposed for work under this solicitation can use ULSD fuel. To demonstrate consideration of ULSD use and feasibility, the Contractor shall provide a statement in one page or less describing whether vessels proposed for work under this solicitation can use ULSD fuel, and if so, the potential vendors it has located.

- The Contractor shall disclose to the Port Authority whether any of the marine vessels being used for work under this contract has been inspected by the U.S. Coast Guard (USCG), and whether that inspection covered the protocols for Annex VI of the International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978, known as Marine
Pollution (MARPOL) 73/78, regarding the proper maintenance and operation of engines and their emissions controls. If so, the Contractor shall provide proof of the appropriate USCG inspection certification for compliance with MARPOL 73/78 Annex VI. Inspected vessels that did not receive certification may not be used for work under this contract until deficiencies that prevented certification are corrected.

5.4 FISH AND WILDLIFE RESOURCES
The Contractor shall keep construction activities under surveillance, management, and control to minimize interference with, disturbance to, and damage of fish and wildlife. The Contractor will take all appropriate measures to comply with wildlife resource protection laws. Some specific considerations for work under this solicitation are as follows:

5.4.1 MIGRATORY BIRD TREATY ACT (MBTA)
Galveston Bay and the Houston metropolitan region are in the major flyway for migration of bird species protected by the MBTA. These bird species use a wide variety of habitats present in the region as temporary stopover habitat on their way north or south. Primary nesting season extends generally from early April to mid-July, and at maximum from early February to late August. The Contractor must observe the requirements of the MBTA to avoid the taking of migratory birds, their eggs, parts, and nests.

5.4.2 ENDANGERED SPECIES ACT (ESA)
The Contractor should be aware of the potential for the presence of federally listed species in the project area, and precautions and notifications to make, in case they are encountered. Five species of sea turtles that frequent the Gulf of Mexico may use inland bays such as Galveston Bay for foraging, with Kemp’s Ridley sea turtle, loggerhead sea turtle, and green sea turtle, most likely to use Galveston Bay waters. Piping plover (Charadrius melodus), occasionally has been known to utilize mud flats found adjacent to or within HSC placement areas. Though preferred habitat for the West Indian manatee (Trichechus manatus) is not present in the project area, it has wandered into Galveston Bay on rare occasions. Should contact with any of these species occur within the project area, the Contractor should contact the U.S. Fish and Wildlife Service’s Houston Coastal Ecological Services Field Office immediately at (281)-286-8282 or in the case of a turtle or manatee, please contact the Marine Mammal Stranding Network at (409)-740-2200. As the National Oceanic and Atmospheric Administration (NOAA) has sole responsibility over sea turtles in a marine environment including bays and estuaries, they should be contacted at (727) 824-5312 for such sightings. The Contractor shall also notify the Port Authority of these sightings and notifications made to the aforementioned agencies.

5.4.3 OYSTER REEFS
The Contractor shall not dredge outside of the project footprint to avoid impacting any reef outside of the new HSC improvement footprint. Any mitigation required as a result of impacting reef outside of the new HSC improvement footprint will be the responsibility of the Contractor.
5.5 CULTURAL RESOURCES

Cultural resource investigations conducted for the proposed improvements to the HSC did not result in identifying existing historical or archeological resources within the project footprint. However, in the event that the Contractor encounters such resources, the Contractor shall not remove or disturb, or cause or permit to be removed or disturbed, any historical, archaeological, architectural, or other cultural artifacts, relics, vestiges, remains, or objects of antiquity. If any such items are discovered on the premises, the Contractor shall immediately notify the Port Construction Representative of the Port of Houston Authority of such discovery, and the site and the items discovered shall be protected by the Contractor from further disturbance until a professional examination of them can be made or until clearance to proceed is authorized by the Port Contract Representative.

END OF SECTION
6   HOUSTON SHIP CHANNEL DREDGING AND PLACEMENT

6.1   SCOPE OF WORK

The work for the Houston Ship Channel (HSC) Expansion Channel Improvement Project (ECIP) consists of furnishing all plant, labor, materials, and equipment, and performing the work required by these Technical Specifications, schedules, and drawings forming parts thereof for this project. The HSC shall be dredged to the lines and grades shown in the Plans and in accordance with the Technical Specification. The Contractor shall excavate the entire quantity of material necessary to complete the work, be it more or less than the amounts estimated. The work is to be done in accordance with the Proposal, Contract, and at the Contract price or prices, subject to the provisions of the Technical Specifications and General Provisions.

The work encompasses dredging HSC Station 98+000 to Station 57+000. A hydrographic survey was conducted in February - March 2020 to determine existing grade elevations of the dredge locations. The results of the survey are shown on the Plans. However, it should be noted that the HSC will be maintenance dredged by others from (fill in contract dates).

New work materials from NW Dredging HSC to ODMDS include the 170-foot channel widening (85-feet to either side), a bend easing at Station 78+844, required side slopes and the replacement of the barge lanes to their existing dimensions outside of the channel widening as shown on the Plans. Debris may be encountered in the excavation areas. Soft shoaled materials encountered near the toe of the existing Federal channel limits shall be considered incidental to the work. No measurement or payment shall be made for soft shoaled materials or debris removed as part of the work.

New work materials excavated from HSC Station 98+000 to Station 57+000 shall be transported and disposed into the ODMDS as shown on the Plans.

New work dredging of the HSC shall be within the horizontal limits shown on the Plans to a required elevation of minus 48 feet MLLW with 2 feet of required overdepth and 1 foot of allowable overdepth. The existing 530-foot wide template was created with a 4H:1V (maintained at 2.5H:1V) slope beginning at the authorized elevation of minus 46 feet MLLW plus 2 feet of advance maintenance plus 2 feet of allowable overdepth. New work templates from Station 98+000 to Station 78+000 have a 3H:1V slope and new work templates from Station 78+000 to 57+000 have a 4H:1V slope.
Table 6-1: Summary of Required Grades and Side Slopes for the HSC ECIP

<table>
<thead>
<tr>
<th>Description</th>
<th>Required Elevation (Feet Below MLLW)</th>
<th>Required Overdepth (Feet Below Required Elevation)</th>
<th>Allowable Overdepth (Feet Below Required Overdepth)</th>
<th>Final Side Slope</th>
<th>From Station</th>
<th>To Station</th>
</tr>
</thead>
<tbody>
<tr>
<td>NW Dredging HSC to ODMDS</td>
<td>-48.0</td>
<td>2.0</td>
<td>1.0</td>
<td>1</td>
<td>3</td>
<td>98+000</td>
</tr>
<tr>
<td></td>
<td>-48.0</td>
<td>2.0</td>
<td>1.0</td>
<td>1</td>
<td>4</td>
<td>78+000</td>
</tr>
</tbody>
</table>

(1) Slopes indicated are design values perpendicular to channel toes. Where cross sections are not perpendicular to channel toes, a skewed slope will result.

6.2 MECHANICAL DREDGING AND PLACEMENT

6.2.1 ORDER OF WORK FOR DREDGING
The Contractor shall perform the dredging work in the order specified in Part 1 Subpart 1.6.1. For the purposes of acceptance, the dredging work items in the Bidding Schedule are further divided into Sections as follow:

Table 6-2: HSC New Work Acceptance Sections

<table>
<thead>
<tr>
<th>Section No.</th>
<th>From Station</th>
<th>To Station</th>
<th>Length of Section (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>98+000</td>
<td>94+000</td>
<td>4,000</td>
</tr>
<tr>
<td>2</td>
<td>94+000</td>
<td>90+000</td>
<td>4,000</td>
</tr>
<tr>
<td>3</td>
<td>90+000</td>
<td>86+000</td>
<td>4,000</td>
</tr>
<tr>
<td>4</td>
<td>86+000</td>
<td>82+000</td>
<td>4,000</td>
</tr>
<tr>
<td>5</td>
<td>82+000</td>
<td>78+000</td>
<td>4,000</td>
</tr>
<tr>
<td>6</td>
<td>78+000</td>
<td>74+000</td>
<td>4,000</td>
</tr>
<tr>
<td>7</td>
<td>74+000</td>
<td>70+000</td>
<td>4,000</td>
</tr>
<tr>
<td>8</td>
<td>70+000</td>
<td>66+000</td>
<td>4,000</td>
</tr>
</tbody>
</table>
The Contractor shall begin dredging new work materials at approximate HSC Station 98+000 and proceed inbound, fully completing excavation for each reach before progressing to the next inbound reach.

### 6.2.2 ESTIMATED QUANTITIES BY STATION

The estimated quantities shown below are based on surveys conducted at the times shown and can only be considered indicative of the conditions at that time. The quantities shown were used to prepare the total estimated quantity of material to be removed shown in the Request for Competitive Sealed Bid/Proposal, and do not include effects of anticipated dredging events or shoaling that may occur prior to commencement of this Contract. Please refer to Technical Specifications Part 6 Subsections 6.2.3 and 6.2.4 for descriptions of anticipated work and shoaling estimates for the project area.

**Table 6-3: Estimated Dredge Quantities for the HSC ECIP**

<table>
<thead>
<tr>
<th>Section No.</th>
<th>From Station</th>
<th>To Station</th>
<th>Required Elevation (CY)</th>
<th>Required Overdepth (CY)</th>
<th>Allowable Overdepth (CY)</th>
<th>Total Estimated (CY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>98+000</td>
<td>94+000</td>
<td>66+000</td>
<td>99,000</td>
<td>48,000</td>
<td>25,000</td>
</tr>
<tr>
<td>2</td>
<td>94+000</td>
<td>90+000</td>
<td>60+000</td>
<td>114,000</td>
<td>48,000</td>
<td>25,000</td>
</tr>
<tr>
<td>3</td>
<td>90+000</td>
<td>86+000</td>
<td>60+000</td>
<td>150,000</td>
<td>50,000</td>
<td>25,000</td>
</tr>
<tr>
<td>4</td>
<td>86+000</td>
<td>82+000</td>
<td>60+000</td>
<td>193,000</td>
<td>52,000</td>
<td>26,000</td>
</tr>
<tr>
<td>5</td>
<td>82+000</td>
<td>78+000</td>
<td>60+000</td>
<td>744,000</td>
<td>86,000</td>
<td>45,000</td>
</tr>
<tr>
<td>6</td>
<td>78+000</td>
<td>74+000</td>
<td>60+000</td>
<td>654,000</td>
<td>64,000</td>
<td>32,000</td>
</tr>
<tr>
<td>7</td>
<td>74+000</td>
<td>70+000</td>
<td>60+000</td>
<td>523,000</td>
<td>50,000</td>
<td>25,000</td>
</tr>
<tr>
<td>8</td>
<td>70+000</td>
<td>66+000</td>
<td>60+000</td>
<td>564,000</td>
<td>50,000</td>
<td>25,000</td>
</tr>
<tr>
<td>9</td>
<td>66+000</td>
<td>60+000</td>
<td>60+000</td>
<td>687,000</td>
<td>50,000</td>
<td>25,000</td>
</tr>
<tr>
<td>10</td>
<td>62+000</td>
<td>57+000</td>
<td>60+000</td>
<td>831,000</td>
<td>63,000</td>
<td>31,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>4,559,000</strong></td>
</tr>
</tbody>
</table>

Quantities are based on hydrographic surveys obtained by the JV, February - March 2020.

### 6.2.3 ANTICIPATED WORK BY OTHERS

Since the last hydrographic survey of the HSC, the USACE has maintained the HSC from Stations 98+000 to 57+000. Dredging is anticipated to be completed [insert date].
6.2.4 SHOALING
The volume of natural shoaling that may occur in an acceptance section during the period of Work is considered incidental to the estimated gross quantity of material to be removed.

6.2.5 REAL TIME KINEMATIC (RTK) GPS FOR DREDGING AND PLACEMENT OPERATIONS
The Contractor shall furnish RTK GPS for surveillance of the movement and disposition of dredged material during excavation and placement. The RTK GPS shall be established, operated, and maintained by the Contractor to continuously track in real-time the horizontal location of each dredge vessel, bucket position (where applicable), and transport vessel (where applicable) at all times. The Contractor shall display and record in real-time the location of each dredge, bucket, and transport vessel.

6.2.5.1 RTK GPS STANDARDS
The Contractor shall provide automated (computer) system and components to collect RTK GPS positioning and tide data. Horizontal and vertical accuracies shall meet the requirements provided in Part 4 of the Technical Specifications. Horizontal location and vertical data shall be collected in sets and each data set shall be referenced in real-time to date and local time (to nearest minute) and shall be referenced to the same state plane coordinate system used for the survey(s) shown in the Plans. The RTK GPS shall be calibrated before dredging operations have started and at thirty-day (30-day) intervals while work is in progress. The Engineer shall have access to the RTK GPS data and equipment in order to observe its operation. It is the Contractor’s responsibility to select a system that will operate properly at the work location.

6.2.5.2 RTK GPS DATA REQUIREMENTS AND SUBMISSIONS
The RTK for each dredge shall be in operation for all dredging and disposal activities. The Engineer shall be notified immediately in the event of RTK failure and all dredging operations for the vessel shall cease until the RTK is fully operational. Any delays resulting from RTK failure shall be at the Contractor’s expense.

All data shall be collected and stored digitally in ASCII format and shall be readable by MS Windows compatible software. Each day’s worth of RTK data shall be a separate and distinct ASCII file, labeled by the date.

The required digital data to be collected for each day includes the following:

- Date
- Time
- Vessel ID (for each dredge and transport vessel)
- Vessel Captain
• For mechanical dredging, dredge bucket location in the X,Y,Z directions at both the bucket grab closing point and the bucket release or opening point over the transport vessel.

• Transport vessel location in the X,Y,Z directions at least every 5-minute interval.

• Date, time, and location at initiation and completion of disposal event.

• Vessel Draft

• RTK Tides

• Load Number

All digital RTK GPS data shall be furnished to the Engineer within 24 hours of collection. During mechanical dredging, a cut chart showing the bucket positions while dredging for each day shall be submitted to the Engineer each week.

6.2.6 DREDGING OPERATIONS

• The dredging templates shall be dredged to the lines and grades indicated on the Plans.

• Holes dug on the banks for deadmen or anchorage shall be filled and repaired to the previous existing lines and grades.

• All manned equipment shall be supplied with two-way radio communication, fixed or portable, capable of transmitting and receiving on both, marine hailing and emergency Channels 13 and 16 as well as two additional Contractor-designated working channels.

• The Contractor will provide constant radio contact between personnel on the dredge(s) and on the transport vessel(s) where applicable.

• All equipment shall have installed and utilize day shapes and lights as required by the latest version of United States Coast Guard regulations.

• Scows used for mechanical dredging, transport, and placement shall be maintained free of leaks, shall be evenly loaded and shall not be filled within 3.0 feet of the coamings to avoid spillage during transport. The Contractor shall notify the Port Authority immediately if excessive leakage occurs while the transport vessel(s) is traveling to the placement area during mechanical dredging. Excessive leakage is defined as any change in draft exceeding 2.0 feet from the point of departure from the dredging site to the disposal site.

• Material shall not be deposited or allowed to flow into project channels or into a bayou or stream tributary to the waterway, or into an existing drainage outlet ditch, canal, water intake or outlet facility, nor shall materials be allowed to flow onto improved areas including highways.
and roads in or adjacent to the site. 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 at no additional cost to the Port Authority. Dragging or washing operations to remove the shoals will not be permitted.

6.2.7 PLACEMENT OF EXCAVATED MATERIAL
Material excavated is to be transported to and deposited in the ODMDS designated. Inspect the ODMDS to ensure that using the area for placement operations will not place it in violation of the applicable Federal, State, or local statutes concerning fish and wildlife. Particular statutes which the Contractor are to consider include but are not limited to the Federal Migratory Bird Treaty Act and the Endangered Species Act of 1973.

6.2.7.1 ODMDS
The dredged material excavated from the channel is to be placed within the approved discharge zone(s) of the ODMDS. The dredged material is to be deposited over or beyond the crests of existing dumping grounds where they exist. The Contractor is to perform its operations using a method that will prevent the material from flowing back into the Channel. The discharge of dredged material is to be made far enough within the discharge area limits to ensure that no material flows beyond the ODMDS limits shown. Material deposited beyond the discharge limits are to be removed by the Contractor at no additional cost to the Port Authority. Shoaling that may occur outside the ODMDS limits are to be removed by the Contractor at its expense. The point of discharge is to be relocated as often as necessary to uniformly distribute the dredged material throughout the ODMDS. An accumulation of material that changes the elevation to exceed 1.0 foot along the ODMDS limits or 5.0 feet within the ODMDS is prohibited.

6.2.7.2 ODMDS MONITORING SURVEYS
The Contractor shall perform hydrographic surveys of the ODMDS as outlined in Part 4 Subsection 4.10 in order to continually monitor the placement of dredged material in the ODMDS.

6.2.8 PLANT
Maintain the plant, barges, and associated equipment to meet the requirements of the work.

6.2.9 REMOVAL OF PLANT AND CLEANUP
Upon approval from the Port Authority of completion of the work by the Contractor, the Contractor shall promptly remove their plant, anchors/frames/stands, ranges, buoys, survey stakes, piles, and other markers or obstructions placed by or for the Contractor. The Contractor will not be permitted to abandon any equipment in the disposal area for dredged materials or other areas adjacent to the worksite.

6.2.10 MEASUREMENT AND PAYMENT
Measurement and payment shall be in accordance with Part 3 of these Technical Specifications.
6.2.10.1 **REQUIRED ELEVATION**

Required elevation areas shall be measured within the horizontal limits for material removed lying above the elevation of Required Elevation shown on the Plans, including material removed above the side slopes extending therefrom, as measured between BD and AD surveys.

6.2.10.2 **OVERDEPTH**

Limits of required and allowable overdepth dredging will be as shown in Table 6.1 and on the Plans. Required overdepth area shall be measured between the elevations and horizontal limits of Required Elevation and Required Overdepth as shown on the Plans. Allowable overdepth area shall be measured between the elevations and horizontal limits of Required Overdepth and Allowable Overdepth as shown on the Plans.

Material actually removed from within the specific area to be dredged will be measured and paid for at the Contract price or prices.

6.2.10.3 **SIDE AND END SLOPES**

The Contractor shall remove sufficient material to provide the limiting side and end slopes specified in this Section. Material actually removed, within the limits shown on the Plans to provide for final side slopes as shown in Table 6.1 but not in excess of the amount originally lying above this limiting side slope will be measured 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. There will be no payment for end slope material that falls into the required cut and is subsequently removed. This Section for compensating side slopes will not apply to areas where dredging is limited due to the proximity of terminal structures or as otherwise indicated in the Plans.

6.2.10.4 **EXCESSIVE DREDGING**

Material taken from beyond the limits as shown in the Plans will be deducted from the gross amount dredged as excessive required grade or overdepth dredging or excessive side or end slope dredging, for which payment or claims shall not be made, except as specified in Technical Specifications Part 6 Subsections 6.2.10.2 and 6.2.10.3.

**END OF SECTION**
APPENDIX A: Geotechnical Study – Houston Ship Channel Expansion Channel Improvement Project Harris, Chambers and Galveston Counties, Texas, Report No. HG1910092.1.1 – DATA (April 30, 2020)
APPENDIX B: Geotechnical Study – Design Report Houston Ship Channel Expansion Channel Improvement Project Harris, Chambers and Galveston Counties, Texas, Report No. HG1910092.1.1 – DES (April 30, 2020)
Appendix C: Magnetometer Survey Report
Appendix D: Required Relocation of Navigation Aides Plan