SCOPE OF WORK
COASTAL TEXAS PROTECTION AND RESTORATION
G28 BOLIVAR PENINSULA & WEST BAY GIWW SHORELINE & ISLAND PROTECTION

G28-1 BOLIVAR PENINSULA BREAKWATER PROJECT

Table of Contents

Initial SP Initial KB

Pursuant to GLO CONTRACT NO. 22-004-009-E790 (CONTRACT) between the TEXAS GENERAL LAND OFFICE (GLO) and DUCKS UNLIMITED, Tax Identification Number 13-5643799 (PROVIDER), the PROVIDER is authorized to perform the services described below under WORK ORDER NO. E790 (WORK ORDER), subject to the Scope of Services; Special Conditions; Tasks, Deliverables and Timeline; Project Budget; and all other terms of this WORK ORDER. The duration for this Scope of Services shall be for 347 days following Notice to Proceed (NTP) from GLO and execution of the WORK ORDER.

INTRODUCTION

The GLO, in partnership with Gulf Coast Protection District (GCPD) and the U.S. Army Corps of Engineers (USACE), is undertaking the Engineering and Design (E&D) for a segment of the Coastal Texas Protection and Restoration (Coastal Texas) G28 Bolivar Peninsula and West Bay Gulf Intracoastal Waterway (GIWW) Shoreline and Island Protection project feature (G28). The G28 project feature is located mostly in Galveston County between Chocolate Bay and High Island along 34 miles of GIWW shoreline, and consists of measures to restore wetlands and islands, construct breakwaters, and create oyster habitat. These measures will decrease shoreline erosion and loss of habitat from vessel wakes, as well as reduce maintenance dredging of the GIWW. The G28-1 project feature segment to be designed under this WORK ORDER is approximately 4 miles of breakwater (G28-1) located along the GIWW adjacent to the Bolivar Peninsula. It is currently anticipated that construction of the G28-1 project feature will be solicited by USACE, therefore the project design shall be performed in coordination with both GLO and USACE Galveston District, and comply with USACE design requirements as specified in this WORK ORDER Scope of Work (SOW).

Table 1: Features of G-28 versus G28-1

Feature	G28	G28-1
Shoreline Protection Breakwater (miles)	35	4
Marsh Nourishment (acres)	208	0
Oyster Reef Creation (acres)	18	0
Island Restoration (acres)	326	0

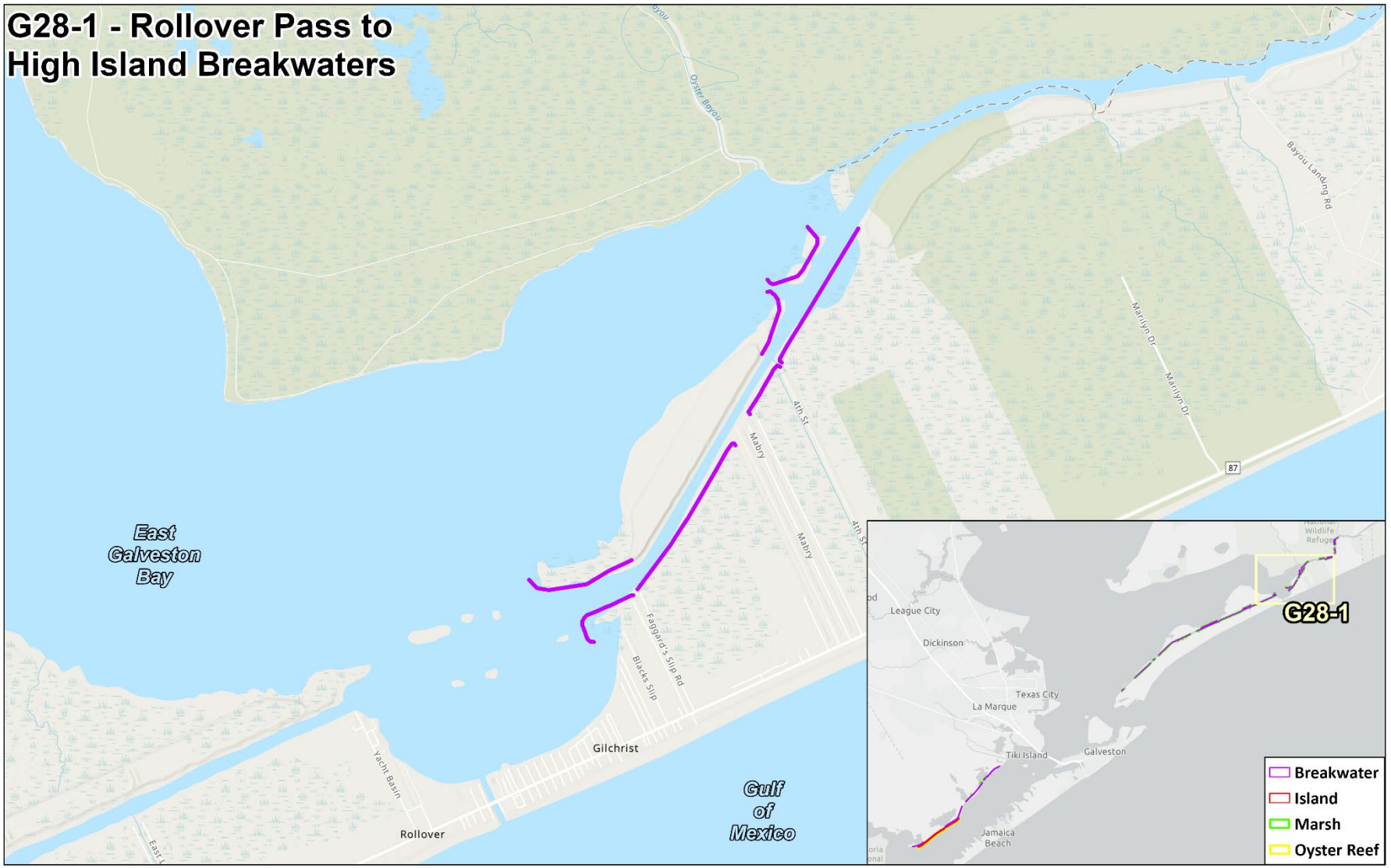

Figure 1: G28-1 Features

1. GENERAL

1.1. PROVIDER Proposal

The PROVIDERS's proposal shall include a breakdown of tasks for this effort and a schedule showing durations and days to be completed from NTP pertaining to the work items shown in this SOW.

Additionally, the breakdown of the PROVIDER's proposal shall be summarized (showing all labor hours per discipline) given the following Work Breakdown Structure (WBS). The PROVIDER shall provide a list of subcontractors anticipated to be used on this task order.

1. Design Quality Control Plan (DQCP) Submittal
2. 10% Basis of Design Report
3. Field Investigations
4. 30% Design Submittal
5. 30% Review Meeting
6. 60% Design Submittal
7. 60% Review Meeting
8. 90% Design Submittal
9. 90%/Agency Technical Review (ATR) Review Meeting

WBS		
Task	SubTask	Description
1		**DQCP & Site Visit**
	1	Kick-Off Meeting
	2	Draft DQCP Development
	3	Final DQCP Development
	4	Site Visit
2		**10% Basis of Design Report (BODR)**
	1	Geotechnical Investigation Plan Development & Review
	2	Survey & Mapping Plan Development & Review
	3	Cultural Resources Desktop Analysis
	4	T&E Species Desktop Habitat Assessment
	5	Oyster & Seagrass Survey & Draft Report
	6	Phase 1 Environmental Site Assessment (ESA) & Draft Report
	7	Phase 1 Environmental Site Assessment (ESA) Final Report
	8	Preliminary Wave Modeling Memo
	9	Draft 10% BODR Report
	10	Final 10% BODR Report
	11	Agency Coordination (USACE, GLO and PROVIDER)
3		**Field Investigations**
	1	Geotechnical Investigation & Laboratory Work
	2	Survey Field Work & Plan Development

4		**30% Design Submittal**
	1	30% Design Documentation Report (DDR)
	2	Preliminary Wave Modeling & Draft Report
	3	Oyster and Seagrass Survey Final Report
	4	30% Design Geotechnical Report
	5	Specification List Development
	6	30% Design Drawings Development
	7	Agency Coordination (USACE, GLO and A/E)
5		**30% Design Review Meeting**
	1	Responses to DrChecks Comments
	2	30% Design Review Meeting
6		**60% Design Submittal**
	1	Draft Value Engineering Study Report
	2	60% DDR
	3	60% MII Cost Estimate
	4	60% SpecsIntact Specifications
	5	Final Wave Modeling & Final Report
	6	60% Design Geotechnical Report
	7	60% Design Drawings Development
	8	60% Construction Schedule Development
	9	Development of Engineering Considerations and Instructions for Field Personnel (ECIFP) Outline
	10	Agency Coordination (USACE, GLO and A/E)
7		**60% Design Review Meeting**
	1	Responses to DrChecks Comments
	2	60% Design Review Meeting
8		**90% Design Submittal**
	1	Final Value Engineering Study Report
	2	90% DDR
	3	90% MII Cost Estimate
	4	90% SpecsIntact Specifications
	5	90% Design Geotechnical Report
	6	90% Design Drawings Development
	7	90% Construction Schedule Development
	8	Draft ECIFP Development
	9	Agency Coordination (USACE, GLO and A/E)
9		**90%/ATR Review Meeting**
	1	Responses to DrChecks Comments (USACE QA & ATR)
	2	90% Design Review Meeting

1.2. Period of Performance

The project is anticipated to be performed over a period of approximately 12 months following NTP, as the 90% Submittal to USACE is to be submitted 310 days following NTP. See Table 3 and attached Project Schedule.

1.3. GLO Point of Contact

GLO Point of Contact (POC):

Name & Title: Abigail Richardson, CEPRA Project Manager

E-mail: abigail.richardson@glo.texas.gov

Phone: 512-475-5400

1.4. USACE Point of Contact

USACE Point of Contact (POC):

Name & Title: Kelly Burks-Copes, Mega Projects Program Support Branch Chief

E-mail: kelly.a.burks-copes@usace.army.mil

Phone: 409-766-3948

1.5. PROVIDER Point of Contact

PROVIDER Point of Contact (POC):

Name & Title: Carter Coleman, PE, Project Manger

E-mail: ccoleman@ducks.org

Phone: 832-535-9178

1.6. References

Some applicable Federal, State, and industry standards are referenced in this SOW. These references are not intended to include all criteria that may apply, nor is it intended to restrict design and construction to only those references listed. All applicable standards, including those that are not referenced or listed, constitute criteria for the execution of this WORK ORDER.

- Engineer Regulation (ER) 1110-2-1150, Engineering and Design for Civil Works Projects (08/31/1999)
- Engineering Circular Bulletin (ECB) 2023-9 Civil Works Design Milestone Checklists (07/20/23)
- ER 415-1-10, Contractor Submittal Requirements (04/30/2010)
- ER 1105-2-100: Planning Guidance Notebook (04/22/2000)
- ER 1110-1-12 Quality Management (07/21/2006)
- ER 1110-2-1302 Civil Works Cost Engineering (06/30/2016)
- ER 1110-1-261 Quality Assurance of Laboratory Testing Procedures (04/28/1999)
- ER 1110-1-8100 Laboratory Investigations and Testing (12/31/1997)
- ER 1110-1-8155, Specifications (10/30/2015)
- ER 1110-1-8159, Engineering and Design-DrChecks (01/01/2015)
- ER1100-2-8162: Incorporating Sea Level Change in Civil Works (06/15/2019)
- ER 1165-2-217, Civil Works Review Policy (09/02/2024)
- Engineer Manual 385-1-1, Safety and Health Requirements (03/15/2024)

2. WORK ORDER DESCRIPTION

2.1. General

The PROVIDER shall deliver all necessary services, including surveys, subsurface soil investigations, materials, supplies, labor, equipment, supervision and coordination with local, State, and Federal authorities. These efforts are required to develop a detailed Engineering and Design (E&D), optimize project features, and prepare a Design Documentation Report (DDR), along with plans and specifications (P&S). The DDR shall include, but is not limited to, ECIFP, Wave Analysis, Phase 1 ESA, project cost estimates, basis of project technical specifications, available data reports, project specific geotechnical investigations, available geotechnical data reports, and geotechnical analyses. At a minimum the PROVIDER will produce the following project components as part of this task order's submittals:

- Project Schedule
- Design Quality Control Plan (DQCP)
- Surveys and Mapping Plan
- Geotechnical Investigations Plan
- Construction Schedule
- Technical Specifications
- Construction Plans
- Design Documentation Report (DDR)
- Engineering Considerations and Instructions for Field Personnel (ECIFP)
- Geotechnical Report
- Value Engineering Study Report
- Preliminary and Detailed Cost Estimate
- Certification of the PROVIDER's Architect-Engineer Quality Review (AEQR)
- Compiling available data in appropriate file formats (e.g., hydrographic, topographic, magnetometer surveys, and geotechnical investigations)

2.2. Construction Cost Limitation (CCL)

The CCL of this project will be developed by the USACE after the 90% design phase is completed.

3. DELIVERABLES/SPECIFIC WORK ITEMS REQUIRED

3.1. General

The PROVIDER shall furnish sufficient technical, supervisory, and administrative personnel at all times to ensure execution of the work in accordance with the work schedule. All work will be accomplished with adequate internal controls and review procedures to minimize conflicts, errors and omissions, to ensure technical accuracy and coordination of all written material, drawings, illustrations, and other documents and to ensure consistency in nomenclature and manner of presentation. Both PDF files and any Word, Excel, Mathcadd or other electronic files used to accomplish the work described in this SOW, shall be submitted. The electronic files shall include, but are not limited to, stability analyses of the breakwater using GeoStudio's SLOPE/W, settlement analyses using Rocscience's Settle, and final boring logs in Bentley OpenGround format.

The plan set shall be developed utilizing AutoCAD Civil3D. Plans shall be submitted in .dwg file format as well as pdf.

3.2. Design Schedule

The PROVIDER shall develop, submit, and maintain the project design schedule based on the actual project WORK ORDER award. The project schedule will be submitted to the GLO one (1) day prior to the kick-off meeting. The schedule will include a breakdown of tasks for design. No changes to the project schedule shall be made without approval of the GLO.

3.3. Design Quality Control Plan (DQCP)

The PROVIDER shall develop, submit, and maintain a Design Quality Control Plan (DQCP) for the work specifically covered under this task order. The DQCP shall comply with ER 1110-12.

3.4. A-E Quality Review

The PROVIDER's A-E Quality Review (AEQR) shall be completed, signed, and submitted at the 30%, 60% and 90% submission of the design package. An approved AEQR form will be included in the DQCP for use during the review.

3.5. Real Estate

3.5.1. Rights of Entry

The PROVIDER shall determine Rights-of-Entry (ROE) requirements for field investigations (i.e. site surveys or geotechnical explorations) and submit those requirements to the GLO for ROE signature coordination with landowners. Required ROEs may be provided to the PROVIDER as they are obtained to allow for phasing of work as signed rights-of entry become available. For tracts on which ROEs cannot be secured in a timely manner, the PROVIDER shall be responsible for coordinating with the GLO to identify an alternate location that will not compromise the work within the project area.

The PROVIDER shall provide drawings of tract or landowner that are crossed or impacted in any way by the field investigation or exploration activities. The PROVIDER shall provide the limits of work for the surveys and explorations, to aid the GLO in obtaining necessary ROEs.

3.5.2. Rights of Way

The PROVIDER shall develop and submit requirements for Rights of Way (ROW) required for construction. The ROW drawings shall show existing property boundaries and corners in state plane coordinates that are crossed or impacted in any way by any feature of this project. These ROW drawings shall show tract ownership(s) (surface and subsurface), acreages, distances, corners, state plane coordinates of the property that is needed for the completion of this project. The ROW drawings shall show all pertinent information relating to the construction of the project, with the existing baselines (including PI stations and azimuths between PI's), limits of work, permanent ROW limits denoted by state plane coordinates, and access routes. The USACE will provide the existing easements and ROW for the project area. The PROVIDER shall review this Government Furnished Information (GFI) and determine if additional information may be required. If further information is required, the PROVIDER shall inform the GLO as soon as possible. If additional ROW is needed for the project in addition to what is currently indicated as existing ROW, this shall be clearly identified. Utilities crossing the alignment and their disposition, utility easements, fence lines, roads, temporary construction easement(s) including adjacent property owners shall be shown on the ROW drawings. The ROW drawings will clearly identify and differentiate among all ownership types (including but not limited to: fee, permanent or temporary easements, recorded leases, etc.). X-Y coordinates will be provided of each PI on the servitude. The same information presented in the ROW drawings will be provided for inclusion into the P&S drawings. Also, each ROW drawing will include Sections, Cities and Ranges. The FINAL ROW drawings will depict and identify Temporary Work area easements pertaining directly to construction such as: access points from public roadways and/or waterways with width measurements, expected staging areas, and expected office trailer locations (including access and utility corridors to service). Final ROW drawings will also depict and identify any additional Permanent easement pertaining directly to lands required at the end of construction for future operation and maintenance.

Easement Titles to be used on the ROW drawings and the Contract Plans:

- "Standard Estate No. 1 Fee Estate" – Breakwater feature/any structure required for the life of project located on emergent and/or submerged private lands.
- "Standard Estate No. 15 Temporary Work Area Easement" -- Temporary surface real estate requiring access, staging for construction.
- "Utility Easement" – To be used for any relocated utilities. The utility sheet should contain an accompanying note that the easement is for "purposes of relocating utility number XYZ"
- "Non-Standard Estate"- Perpetual easement/other real estate instrument required for breakwater feature/any structure required for the life of project located on emergent and/or submerged land owned by the state.

All ROW drawings will be overlaid on aerial photography. Line types shall be such that different easements, fee areas, new and existing rights-of-way, and limits of work are clearly defined (work limit line types should also include a differentiation between permanent project ROW requirements and temporary project ROW requirements). The ROW drawings will be prepared by the PROVIDER, however, obtaining the final ROW for construction is the responsibility of the GCPD, in coordination with USACE.

3.5.3. Real Estate Records

The PROVIDER shall be responsible for performing courthouse records research to identify and verify ownership for lands not included in the existing project easement/ROW. Additionally, the PROVIDER shall be responsible for performing courthouse records research to identify and verify ownership for all utility/facility easements impacted by the project. The PROVIDER will be required to indicate the book and page of the recorded legal instrument corresponding to each tract, utility/facility easement, and other items within the project area that are discovered in the courthouse records search on their drawings. In addition, the PROVIDER shall be responsible for creating a Records Index describing all tract and utility/facility information that was obtained for the work in the SOW. An example Records Index will be provided by the GLO as GFI.

3.6. Environmental Site Assessments (ESA)

The PROVIDER shall conduct a Phase 1 ESA in accordance with the guidelines contained in the ASTM International Standard E 1527-21. The following work items shall be completed as part of the Phase 1 ESA:

- Historical Review. Reviewing available current and historical aerial photographs, historical topographic maps, Sanborn fire insurance maps, and historical city directories. Historical chain-of-title (COT) research will not be obtained for this project. Historical data shall be supplemented with interviews of knowledgeable parties, if those parties can be identified during the course of this study.
- Regulatory Data. Environmental data shall be obtained for registered hazardous waste and petroleum sites in the vicinity of the project sites. Oil/gas and water well searches will be conducted. The PROVIDER shall conduct a review of files of regulated environmental sites that may pose a concern to the project. The PROVIDER shall also review any existing studies provided by the Client or property tenants that might contain information related to known or potential Recognized Environmental Conditions (REC) on the site.
- Site Reconnaissance. A thorough site reconnaissance shall be conducted on all properties where the proposed site assessment is planned. Interviews will be conducted with key site individuals of regulated environmental sites and sites that may store or use potential contaminants. Adjoining and adjacent properties shall be observed for the potential to impact the site and any regulated sites adjacent to the property shall be observed. Photographs shall be taken during the site visit to document observations. Invasive techniques shall not be used during the site reconnaissance survey.
- Report Preparation. The PROVIDER shall prepare a report summarizing findings and conclusions. The report shall include: a summary of field observation data; figures and/or drawings depicting general, environmental, and geologic conditions; photographs with labels, a review for the potential for contamination to impact the site; and recommendations for further environmental studies (if necessary).

3.7. Oyster and Seagrass Survey

The PROVIDER shall conduct a survey to map the presence or absence of oysters and seagrass within the NEPA approved breakwater alignments. The following work items shall be completed as part of the Oyster and Seagrass Survey:

- Oyster and Seagrass Survey. FNI will conduct a survey to document the presence or absence and extents of oysters and seagrass within the NEPA approved breakwater footprints. FNI will utilize a combination of the following sampling techniques based on weather and water level conditions during the survey:
    - FNI will collect bottom samples with sediment samplers and/or modified rakes from a shallow-draft boat. Bottom samples will be collected every approximately 100 feet along the breakwater alignments. Bottom characteristics, including the presence of seagrass (including rhizomes, stems, or leaves) and/or oysters (consolidated oyster shell or reef), will be recorded for each bottom sample on data sheets. GPS locations will be taken for each bottom sample and photos of samples and bottom substrate will be recorded.
    - If oyster reefs or seagrass beds are encountered, the extents of these habitats will be delineated and mapped using sub-meter accuracy GPS units.
    - In areas where water depths are greater than 2 feet, FNI will utilize side-scan sonar to map the bottom within the NEPA approved breakwater footprints. The bottom samples will be used to supplement the side-scan sonar imagery to confirm bottom characteristics.
    - FNI will have a team of three (3) people, including one boat captain, to conduct the oyster and seagrass survey over the course of three (3) days. The survey is weather dependent and conditions such as rain or high winds may delay the survey.
- Oyster and Seagrass Survey Report. The PROVIDER shall prepare a report summarizing the findings and conclusions from the oyster and seagrass survey. The report shall include: a summary of field observation data; figures showing bottom samples and characteristics and the extents delineated features if oysters or seagrass are encountered; and, photographs of bottom samples with labels.
- The PROVIDER shall deliver the following work products:
    - GIS files (bottom samples and delineated features if oysters or seagrass are encountered)
    - Photographs documents bottom sample characteristics
    - Draft and Final Oyster and Seagrass Survey Report

3.8. Air Quality Emission Evaluation

Appendix G of the Coastal Texas Protection and Restoration Feasibility Study Environmental Impact Statement (EIS) documented an approach to complying with the Clean Air Act (CAA) General Conformity (GC) Rules that sought to determine conformity following the tiered approach adopted for completing National Environmental Policy Act (NEPA) documentation as the individual component and separable elements of the Recommended Plan get designed and implemented. Because many measures and features of measures can function independently to provide benefits, especially the Ecosystem Restoration (ER) measures such as G28, the approach of separating independent actions into their own GC analysis was deemed practical and supported by TCEQ and EPA, as documented in Section 3.2 of Appendix G. Therefore, GC analysis of this first increment G28-1, which would wholly provide erosion protection for degrading marsh behind it for the protected segment, will be analyzed separately for GC compliance, as no other current Coastal Texas plan measures are anticipated be in Preconstruction Engineering Design (PED), bidding and implementation as early as or simultaneously with G28-1.The first step in determining whether an individual project is subject to GC determination under 40 CFR 93 is to estimate emissions and compare them to applicable de minimis thresholds to determine GC determination applicability. The Provider will provide an estimate of construction air emissions

associated with G28-1 for the purpose of determining if the applicable de minimis thresholds for CAA nonattainment zone pollutants will be exceeded or not, to assess if a full GC determination in accordance with Chapter 40 of Code of Federal Regulations (CFR) Part 93 (40 CFR 93) is necessary. Because of the size and nature of this project increment, de minimis thresholds are not anticipated to be exceeded; therefore, it is not currently assumed that a full GC determination will be needed, and associated services are not scoped.

The Provider will estimate construction emissions by determining equipment needed for construction, a construction schedule defining equipment use duration, and estimating GC pollutant emissions. Determining the list of construction equipment and schedule will require a general analysis of the construction amounts, productivity, duration, and equipment attributes (e.g. horsepower and duty cycles). This will be conducted primarily using general equipment usage and productivity factors readily available in literature and previous published conformity or emissions inventory estimates, and a limited amount of consultation with construction management estimation expertise. The emissions estimates will be conducted using marine and nonroad construction emissions factors used in published air emissions inventories from port authorities and in EPA emissions inventory guidance. The Provider will retain a specialty subconsultant to calculate the emissions.

To fulfill the requirements of Greenhouse Gas (GHG) estimation to meet USACE sea level change (SLC) analysis policy, the emissions factors for significant GHGs will be added to the estimation process used for de minimis threshold analysis. The resultant emissions estimate will be compared to readily available regional GHG estimates for context.

It is anticipated that that some coordination will be necessary with the Texas Commission on Environmental Quality (TCEQ) and Environmental Protection Agency (EPA) Region 6 to ensure they agree on some key assumptions for the emissions estimate including emissions standards assumptions and material transport assumptions. The Provider will conduct two coordination calls with these agencies at the start of the estimate process, and one coordination call at the end of the process to review results and get TCEQ and EPA Region 6 agreement on the determination of applicability.

The results of the analyses will be summarized in a letter memo documenting the results, methodology and comparison to relevant thresholds.

3.9. Cultural Resource Surveys

The PROVIDER shall conduct a Cultural Resources Desktop Analysis. Section 106 of the National Historic Preservation Act (NHPA) requires that each federal agency (i.e., USACE) identify and assess the effects its actions may have on historic resources. Work items shall include the following:

- Desktop Review: The PROVIDER's Professional Archeologist shall conduct a desktop review using the Texas Historical Commission (THC) Texas Historic Sites Atlas and Texas Archeological Sites Atlas to determine whether any previously recorded archeological sites or historic properties are located within a one-kilometer search radius of the Area of Potential Effect (APE). The APE shall consist of the G28-1 project feature footprint. Archeological and historic data from the THC shall be purchased for inclusion in GIS maps.
- Cultural Resources Report: The PROVIDER shall prepare a cultural resources report with GIS figures to document the findings from the desktop review. The draft report shall be provided to the GLO/USACE for review and comment. The final report shall be provided to USACE, who as the Lead Federal Agency, will complete its own review under Section 106 of the NHPA and submit the report to the THC (State Marine Archeologist) and USACE Archeologist.
- Marine Archeological Survey **[optional service – not included in the WORK ORDER]:** If the State Marine Archeologist or USACE Archeologist require a marine archeological survey and coordination based on the results of the desktop review, then this effort would need to be accomplished by the PROVIDER through an amendment to the WORK ORDER.

3.10. Threatened and Endangered Species Habitat Assessment

Threatened and endangered species are federally protected under the Endangered Species Act. If a project is federally funded, authorized, or carried out by a Federal agency, the permitting process requires Section 7 consultation between the lead federal agency (i.e., the USACE) and the U.S. Fish & Wildlife Service (USFWS) and/or the National Marine Fisheries Service (NMFS). The PROVIDER shall perform the following work items:

- Desktop Review: The PROVIDER shall conduct a desktop review for federally listed or proposed threatened and endangered species and designated Critical Habitat with the potential to occur in or near the project area or be impacted by the G28-1 project activities. The PROVIDER shall utilize information from the USFWS Information for Planning and Consultation (IPaC) database, NOAA Fisheries species directory, and NOAA Section 7 Mapper tool to conduct this review.
- Threatened and Endangered Species Habitat Assessment Report: The PROVIDER shall prepare a threatened and endangered species habitat assessment report to document the findings from the desktop review including recommended effect determinations for each species. The report will also document compliance with the Magnuson Stevens Fishery Conservation Management Act for fish passages within the breakwaters. The draft report shall be provided to the GLO/USACE for review and comment. The final report shall be provided to USACE, who as the Lead Federal Agency, will complete interagency consultation with USFWS and/or NMFS to document compliance with the Endangered Species Act.
- Section 7 Consultation with USFWS and/or NMFS **[optional service – not included in WORK ORDER]:** If required by USFWS and/or NMFS to comply with the Endangered Species Act, Section 7 consultation with USFWS and/or NMFS would be conducted by the PROVIDER for adverse impacts to federally listed or proposed species (or their habitat) through an amendment to the WORK ORDER. This effort could require the PROVIDER perform presence/absence surveys conducted by qualified biologists or development of a Biological Assessment and implementation of conservation measures, such as lighting and noise restrictions.

3.11. Monitoring and Adaptive Management Plan

The PROVIDER shall develop a Monitoring and Adaptive Management Plan (MAMP) that will identify the monitoring activities necessary to assess the success of the breakwater features for G28-1, and, if needed, adaptively manage the project features to achieve the desired objectives. The MAMP shall use the proposed performance measure criteria of shoreline change, marsh elevation, and marsh vegetation composition as outlined in the MAMP for the Coastal Texas Feasibility Study to determine restoration success.

This task does not include any field work/site reconnaissance or data collection as part of the MAMP. This task includes only development of the MAMP. The draft MAMP shall be provided to the GLO/USACE for review and comment. The final MAMP shall be provided to USACE after USACE/GLO comments have been addressed.

3.12. Wave Modeling

The PROVIDER shall conduct wave modeling by the means of calculating wave impacts on design breakwaters using the USACE Automated Coastal Engineering System (ACES) calculations in the Coastal Engineering and Design and Analysis System (CEDAS) software. Wave modeling shall be completed as an early deliverable as outlined in the schedule. The PROVIDER shall perform the wave modeling as follows:

- Design conditions shall compare 50%, 10%, 5%, and 2% AEP storm events for wind, waves, and

water level to determine controlling condition for a 50-year design life for an initial design crest elevation of +7 feet NAVD88. The design life shall incorporate a static water level increase based on sea level rise (SLR) as outlined by ER 1100-2-8162: Incorporating Sea Level Change in Civil Works Programs.

- Wind speeds, waves, and water levels shall be extracted from USACE Coastal Texas Study save points for design condition AEPs of 50%, 10%, 5%, and 2% AEP storm events, where available. In addition, wind speeds shall be collected from the nearest gauge with the most robust record, water levels shall be extracted from the nearest NOAA gauge with a long-term record with water level AEP calculations, and wave heights shall be calculated using fetch based methods from the Shore Protection Manual.
- Site specific wave heights shall be extracted from USACE Coastal Texas Study or calculated for each mile of structure. Design parameters shall account for water depth, breakwater heading, proximity to navigation channel, and fetch distance to calculate the largest armor stone size for each mile of breakwater.
- Wave overtopping and transmission shall be calculated using the tools provided within ACES using armor stability coefficients for damage up to 10%. Wave generated scour shall be calculated using methods outlined in the Coastal Engineering Manual.
- Vessel wakes impacting the breakwater shall be calculated using USACE Vessel Wake Prediction Tool with site specific conditions for water depth, channel geometry, and vessels observed transiting the Gulf Intracoastal Waterway in 2023 from the NOAA Marine Cadastre (https://hub.marinecadastre.gov/pages/vesseltraffic).
- Wave modeling shall not include development of a numerical model (e.g., ADCIRC, Delft3D, CMS, STWAVE, etc.) or computational fluid dynamics modeling.

The PROVIDER shall deliver the following work products:

- Wind speed, water elevation, and wave heights extracted from Coastal Texas Study.
- ACES Calculation Output for armor size, wave transmission and overtopping.
- NOAA Marine Cadastre Vessel Summary for 2024
- Vessel Wake Prediction Calculation Output
- Design Memorandum with 10% Basis of Design Report, Draft Report with 30% Design Submittal, and Final Report with 60% Design Submittal

3.13. Value Engineering Study

The PROVIDER shall provide the following services consistent with the SAVE International Value Methodology Standard.

VE Team Leader: The VE Team Leader will be a certified value specialist (CVS). In addition, a VE Workshop Assistant will be provided during the workshop to assist with administrative activities and to begin preparation of the study report. This will improve the VE Team's effectiveness and expedite the report delivery.

VE Study Team: The VE Study Team will include up to seven (7) team members from the 3rd party value engineering provider and up to (5) members of the design team. All team members are expected to spend up to eight (8) hours reviewing these documents in advance of the workshop.

Anticipated 3rd party value engineering team members:

- VE Tean Leader (CVS)

- VE Workshop Assistant
- Cost Estimator
- Environmental Engineer
- Geotechnical Engineer
- Coastal/Marine Specialist
- Constructability expert with marine experience

Anticipated design team members:

- PM
- Civil Engineer
- Coastal Engineer
- Geotechnical Engineer
- Environmental Scientist

Pre-VE Workshop Activities:

The PROVIDER will perform pre-workshop activities to include those tasks which must be accomplished in order for the VE team to be able to efficiently and effectively perform in the workshop.

These activities will consist of:

- scheduling study tasks
- scheduling and coordination VE team members
- coordination of the necessary documentation on the project for distribution to the VE team members

VE Workshop:

The PROVIDER will conduct the value engineering workshop using a job plan that is consistent with the practices and procedures recognized by SAVE International. This job plan will include a 32-hour workshop, located in Texas. The workshop will include an Information Phase, a Function Analysis Phase, a Creative Phase, an Evaluation Phase, a Development Phase, and a Presentation Phase.

The workshop will be initiated by presentations that will describe the objectives of this project and any constraints that will be placed on the VE study. The project design team will explain specifically how the design accomplishes the objectives and the details of that design. The workshop will include a complete function analysis of the major project elements. The team will generate a list of ideas for project improvement followed by an evaluation of those ideas. This evaluation will include input from key decision makers before proceeding with development of recommendations. On the last day of the workshop, a presentation of the recommendations will be provided to decision makers.

Post-VE Workshop Implementation Meeting:

The PROVIDER will conduct a two (2) hour post-workshop Implementation Meeting, virtually, following review of the Draft Report. Written responses shall be provided documenting the reasons for acceptance or rejection for all VE recommendations. These responses will be reviewed and a meeting scheduled between the VE Team Leader, the design team and any other stakeholders deemed appropriate. The purpose of the Implementation Meeting will be to discuss each recommendation and to help the delivery team reach decisions about whether or not to incorporate the recommendations into the design. After the implementation meeting, the VE Team Leader shall incorporate the results of the implementation meeting into the Final Value Engineering Report. Results shall include technical justifications why each proposal is accepted/partially accepted/further evaluated/rejected/withdrawn. The Final Report will also document the estimated savings from the workshop.

Deliverables:

This VE study effort will include four deliverables, all of which are related to the results of the workshop. These deliverables are:

- VE Team Presentation Handout
- Preliminary VE Study Report
- Draft VE Study Report
- Final VE Study Report

3.14. Site Surveys and Mapping

The PROVIDER shall perform surveys as required to accomplish the work required by this SOW. ROE drawings for site survey and mapping shall be prepared by the PROVIDER as described in the "REAL ESTATE" section of this SOW and provided to the GLO. The surveys and mapping shall meet USACE/GLO requirements. The surveys and mapping plan shall be submitted for a USACE/GLO review and approval.

3.15. Geotechnical Explorations, Tests and Analyses

The GLO and USACE will provide available existing geotechnical information for the G28-1 reaches as a GFI. The PROVIDER shall review the available geotechnical data from GLO/USACE and shall develop a project-specific geotechnical investigation plan to meet the design requirements. This plan shall be submitted to GLO/USACE for review prior to the 10% submittal. All field classifications will be updated as needed based on laboratory results. The additional geotechnical explorations, testing, and analyses shall meet the requirements described in Section 3.16 Geotechnical Investigation Plan.

3.16. Geotechnical Investigation Plan

If additional geotechnical explorations are required, the PROVIDER shall develop a geotechnical investigation plan to show the proposed exploration locations, depths, sampling intervals, and types of testing. The PROVIDER will take care so as to not damage the existing structures and its associated foundations with any drilling or other equipment in the field explorations process. The PROVIDER will have all necessary casing and emergency materials on site in the event that cavities or progressive erosion is encountered in the boreholes and the general working area. In addition, containment measures will be provided by the PROVIDER in the event that contaminated soils are encountered. The PROVIDER shall develop a detailed APP to contain any contaminant that is encountered during drilling. The Performance Work Statement provided by the USACE as GFI will generally be used as the basis for administration, review, and approval of submittals/deliverables of proposed Geotechnical Field Exploration and Laboratory Testing by the Provider.

3.17. Contract Technical Specifications

The PROVIDER shall develop technical specifications utilizing SpecsIntact for the use in the construction of contract of the project. For the 30% design submittal, the PROVIDER will submit specifications with table of contents, Contractor Line Item Number (CLIN) Schedule, and Section 01 11 00 (Summary of Work). For the 60% design submittal, the PROVIDER will submit specifications with updated divisions from the 30% design DrCheck comments, and a draft version for all additional required divisions. For the 90% design submittal, the PROVIDER will submit specifications with updated divisions from the 60% design DrCheck comments.

3.18. Construction Contract Plans

The PROVIDER shall develop engineering drawings for the use in the construction of contract for the project. The detail shall be sufficient to document existing conditions, identify the ROW constraints, identify likely relocations (if any), detail additional coordination and permitting requirements, and provide the construction contractor enough information to develop a cost and schedule proposal. The drawings shall contain adequate details of all items necessary for final design at a scale, which clearly presents these conditions. All notes and references to details for the various items and features of the work shall be clearly shown and identified. The plates prepared for the DDR shall be utilized to the fullest extent possible in preparing the contract plans. A professional registered engineer shall put a stamp and signature on each drawing for which the PROVIDER is responsible. Drawings shall be in accordance with AEC and USACE standards and include at a minimum the following, if applicable:

- Demolition Plans
- Permanent and Temporary ROWs
- Utilities Locations and Descriptions
- Site/Civil Plans
- Geotechnical Fence Diagram
- Feature Typical Details

- Feature Plan and Profiles

Final reproducible drawings in a DWG format shall be submitted after all comments have been incorporated or resolved. For the construction contract plan at 30% design submittal, the PROVIDER will include at a minimum utility locations and description, ROW lines, project alignment, site layout, and preliminary typical cross sections. For the construction contract plan at 60% design submittal, the PROVIDER will have at a minimum updated drawings based on the 30% design submittal memorandum commits, construction notes, and finalized typical cross sections. For the construction contract plans at the **90% design submittal**, the PROVIDER will have all DrCheck comments incorporated from previous reviews.

3.19. Design Documentation Report

The PROVIDER shall develop a design document report (DDR) in accordance with ER 1110-2-1150, Engineering and Design for Civil Works Project for the 30%, 60%, and 90% submittals. The DDR template provided to the PROVIDER as GFI shall be followed. At a minimum the DDR will include a full record of design decisions, assumptions, and methods of the new project features. The geotechnical section of the DDR will be a summary of the geotechnical report for assumptions used in the design, geotechnical investigation findings, and the calculated factors of safety. The details of establishing the subsurface profiles, geotechnical analysis, and model run outputs completed by the PROVIDER will be included in the geotechnical report as an appendix of the DDR. The environmental section of the DDR will include an Environmental Information Report (EIR) that compiles the environmental studies performed in this SOW and will include Conservation Measures and BMPs as outlined in the existing Biological Assessment from the Coastal Texas Feasibility Study. The PROVIDER will be required to incorporate design calculations and methods into the DDR for each submittal. The PROVIDER will incorporate all comments from DrChecks into the DDR prior to its next submittal. A cost estimate along with the decisions and assumptions for determining the cost estimate will be developed at the 60% and 90% submittals. Native cost estimate details and backup data to be provided under separate cover to Project Manager (to provide to USACE Cost Reviewer).

3.20. Geotechnical Design

The PROVIDER shall prepare a geotechnical report, including design analysis, based upon work to be performed for this project. The PROVIDER shall submit the geotechnical report to the GLO and USACE for review after it is complete; however, drafts of the report will be required at various submittals (30%, 60%, 90%) as defined in section 'PROJECT SCHEDULE AND MEETINGS'. The PROVIDER's geotechnical report shall include existing geotechnical information submitted as a GFI, and any additional information generated by the PROVIDER.

The geotechnical report shall be organized using section dividers and numbered pages and any other methods for clear presentation. All designs shall meet the design requirements described in Section "DESIGN SCOPE AND REFERENCE INFORMATION," at a minimum. The minimum required information for the geotechnical information shall include the following information:

- Finalized Exploration Location Maps
- Table of Explorations (Type, Coordinates, Top Elevation, Final Depth)
- Finalized Exploration Logs
- Laboratory Results
- Table of Generalized Subsurface Profile(s)
- Subsurface Profile Fence Diagram
- Subsurface Profile Cross Section(s)
- Assumptions for Use in Design

- Geotechnical Design Criteria
- Construction Recommendations
- Printouts of Model Results

3.21. Construction Cost Estimate

The PROVIDER shall develop and submit a detailed construction cost estimate at the 60% and 90% design prepared in MII software; and a Construction Schedule that is based upon crew durations in the detailed cost estimate. Adequate and professional documentation is required for the review process and for the defense of the estimate under protest. Submittal information and comment responses shall be submitted in electronic format with descriptive filenames that include the subject, submittal % and the date (example: SN 110-002 Cost Est. 90% SUB Comment Resp. YYYYMMDD).

The process for developing the cost estimate and the final calculations of the cost estimate will be provided under separate cover from the DDR to Project Manager (to provide to USACE Cost Reviewer). The construction cost estimate shall be developed and formatted as specified in Section 'DESIGN SCOPE AND REFERENCE INFORMATION'.

3.22. Engineer Considerations and Instructions to Field Personnel

The PROVIDER shall develop Engineer Considerations and Instructions to Field Personnel (ECIFP) to ensure safe construction practices and compliance with project design requirements, to be submitted as part of the 90% design submittal. For the 60% design submittal, only an outline of the applicable sections and a developed introduction section will be required. The requirements for the ECIFP are provided in ER 1110-2-1150 and a template for the ECIFP will be provided by USACE through GLO and shall be followed by the PROVIDER for use in the development of the ECIFP.

4. DESIGN SCOPE AND REFERENCE INFORMATION

4.1. General

The PROVIDER shall perform all civil, structural and geotechnical designs and field investigations for any temporary and permanent features listed that are determined to be necessary for the G28-1 project. All designs and field investigations shall be based on established engineering practices, incorporating advanced technology when it has been demonstrated that such technology gives safe and efficient designs and shall meet GLO and USACE tolerable risk guidelines. The PROVIDER shall design and gather the field investigations in accordance with the applicable provisions set forth in engineering publications and the design methodology referenced in this SOW. The references provided herein are not to be considered all-inclusive. It is the PROVIDER's responsibility to obtain the most recent editions of all design codes for use in the execution of the work specified herein. Additionally, it is the PROVIDER's responsibility to determine that all applicable codes, regulations, and design criteria, even if not specifically listed in this SOW, are utilized and adhered to. The PROVIDER shall list all criteria used for design in the appropriate sections of the DDR.

4.2. Geotechnical Explorations and Testing

The PROVIDER will be furnished, by the GLO and USACE, existing geotechnical investigations available at the project site. Any additional data necessary to support the evaluation and designs shall be obtained by the PROVIDER.

PROVIDER shall develop a field exploration plan and develop laboratory test assignments for review and approval.

Laboratory test results and CPT data collected shall be processed and reviewed by the PROVIDER to develop strength, moisture, unit weight, and settlement characteristic profiles for use in geotechnical engineering analyses. Subsurface profiles and associated soil parameters shall be submitted for approval by the GLO/USACE prior to any geotechnical analysis being performed. Up to two (2) design soil profiles may be developed.

The PROVIDER shall contact Texas 811 to notify them of the intent to perform soil borings and cone penetration test (CPT) soundings and to clear the investigation locations of potential underground utilities. This SOW does not include any additional subsurface utility location services and the PROVIDER shall not be responsible for private, unmarked, or mismarked utility lines.

The PROVIDER shall complete a database search of Threatened and Endangered Species with Texas Parks and Wildlife and USFWS, and make a Section 106 database request from the Texas Historical Commission. This is necessary to comply with the terms of the USACE nationwide permit 6 for survey activities.

The geotechnical work shall include drilling of 5 soil borings to a depth of up to 55 feet below the existing mudline using a pontoon-mounted drill rig. Other details related to the field exploration follow:

- Samples shall be collected in the soil boring at 2-foot intervals for the first 20 feet and at 5-foot intervals thereafter.
- Undisturbed cohesive and semi-cohesive samples shall be collected using 3-inch outside diameter (OD) thin-walled steel tube samplers. Cohesionless soils and soils that are unable to be collected using undisturbed methods of drilling shall be collected using the standard penetration test (SPT). The PROVIDER's field representative will log the soil boring and preserve the samples for transportation to our laboratory. Medium or stiffer cohesive and semi-cohesive soils may be extruded in the field and preserved for transport. Soft cohesive and semi-cohesive samples shall be kept in the tube, capped/sealed on both ends, and transported to the lab in the tube for extrusion in the lab.

- Soil borings may be terminated shallower than 55 feet below mudline, if 30 feet of stiff clay is present.
- The borings will be backfilled in accordance with Texas requirements.

Complete up to 7 CPT soundings using an airboat-mounted CPT rig, to a depth of 55 feet below mudline or refusal, whichever is shallower. It is anticipated that by using an airboat-mounted rig, it will not be possible to apply a large resistance weight with which to push the cone. The purpose of this approach is to delineate soft soil and identify the depth to stiffer underlying soils.

Complete a laboratory testing program on select samples obtained from the soil borings. The tests may include the following:

- Standard classification of soils in general accordance with ASTM International (ASTM) D2488.
- Gradation of soils in general accordance with ASTM D6913, D1140 and D7928.
- Moisture content determination in general accordance with ASTM D2216.
- Atterberg Limits determination in general accordance with ASTM D4318.
- Unconfined compressive strength determination in general accordance with ASTM D2166.
- Unconsolidated-undrained compressive strength determination in general accordance with ASTM D2850.
- One-dimensional consolidation in general accordance with ASTM D2435.

The PROVIDER will use programs that are compatible to USACE systems and software.

The following USACE EMs, Engineering Technical Letters (ETL), ECs (all available on the internet at : http://www.publications.usace.army.mil/) and other Technical Publications shall be utilized in the

geotechnical explorations and testing (latest versions shall be used);

EM 1110-1-1804 Geotechnical Investigations EM
1110-2-1906 Laboratory Soil Testing
ER 1110-1-1807 Drilling in Earthen Embankment Dams and Levees

4.3. Site Surveys and Mapping

The PROVIDER will be furnished existing site survey and mapping documentation available at the project site by the GLO and USACE as a GFI. Any additional data necessary to support the designs shall be obtained by the PROVIDER. If additional survey information is deemed necessary, the type, quantity and any other information that may be required for the survey efforts shall be included in the Survey and Mapping Plan submittal. All work included in the PROVIDER's survey plan shall conform to current USACE publications and/or guidance.

The following USACE EM's, ETL's, EC's (all available on the internet at: http://www.publications.usace.army.mil/) and other Technical Publications shall be utilized in the site surveys and mapping (latest versions shall be used):

EM 405-1-3 Real Estate Geospatial Data and Mapping EM
1110-1-1002 Survey Markers and Monumentations
EM 1110-1-1003 NAVSTAR Global Positioning System Surveying EM
1110-1-1005 Control and Topographic Surveying
EM 1110-1-2909 Geospatial Data and Systems
EM 1110-2-6056, Standards and Procedures for Referencing Project Elevation Grades to Nationwide Vertical Datums
ER_1110-1-8156 Policies, Guidance, and Requirements for Geospatial Data and Systems ER
1110-1-8170 Policies for using USACE Monument Archival and Retrieval Tool (USMART)
ER 1110-2-8160 Policies for Referencing Project Elevation Grades to Nationwide Vertical Datum's
EM 1110-2-1003 Hydrographic Surveying

4.3.1. Topographic Survey

A temporary base station (TBM) shall be established near the job site by running static observations and the data shall be post-processed utilizing Trimbles OPUS solution. A base station shall be setup on this point daily to receive real time tide corrections on the rover via radio link. Additional survey monuments will be set. This rover will be utilized to establish a survey control network. Topographic survey (point) data will be collected with this rover in areas within the survey polygon at a data density necessary to facilitate engineering design where traditional bathymetric data cannot be collected.

4.3.2. Bathymetric Survey

The bathymetric survey shall be performed aboard a 28' survey vessel with a 2-man crew. The vessel shall be equipped with an Applanix GPS/IMU system with an Odom CV100 dual frequency echosounder. A base station shall be setup on a point from the control network daily to receive real time tide corrections on the vessel via radio link. On the vessel, measurements shall be taken to input x, y, and z offsets from the vessels CRP to the echo-sounder transducer. The vertical offset shall be measured from the waterline to the primary antenna's phase center to achieve real time tide corrections during survey operations. A draft measurement shall be taken and input into the CV100 system from the bottom of the transducer to the waterline. The IMU system offsets will also be accounted for to obtain pitch, roll, and heave to compensate for the vessel motion during survey operations. Prior to survey

operations daily, a sound velocity shall be obtained in multiple locations near the job site utilizing an AML-2 sound velocity profiler. The average sound velocity shall be input into the CV100 topside unit. A bar check shall be performed before and after survey operations daily. The bar will be lowered to a predetermined depth below the transducer where the operator will adjust the draft and index values to achieve accurate water bottom readings from the echo-sounder. Typically, this is done at two different depths when possible. Top of water elevation shots shall be taken periodically throughout the day to QA/QC the real time tide corrections. Horizontal positioning of the survey vessel will be accomplished using Hypack navigation software with a Trimble R7/R8 GNSS GPS RTK global positioning receiver.

4.3.3. Magnetometer Survey

A survey crew shall perform magnetometer/bathymetric surveys at 50' spacings along river. A survey crew shall perform an exploratory magnetic anomaly probing investigation based on the magnetometer surveys and available pipeline GIS database information. This probing investigation shall attempt to locate the existing pipelines and utilities within the project area. This investigation shall provide the project team with more accurate information as to the location, size, and depth of cover of the existing pipelines. This proposed investigation shall perform additional gradiometer loops around magnetic anomalies and probe and mark the existing pipelines at 100' intervals.

4.3.4. Base Map, Boundary Surveys, Plat Production

The PROVIDER will evaluate existing ownership and easement deeds and maps and will perform boundary surveys sufficient to produce certified plat and field notes for impacted tracts under the supervision and responsible charge of a Texas Registered Professional Land Surveyor. Easement/right-of-way widths will be based on documents as provided by Ducks Unlimited and deliverables will include a certified plat and field notes for each of the 26 assumed tracts that are impacted by the route. The PROVIDER will maintain and deliver a survey base map in Autocad format containing all collected survey points and line work. Base map will also include easement footprint and any additional workspaces as required from DU project specifications. Deliverables will also include a Google Earth KMZ and ESRI shape file of the proposed design footprint.

4.4. Geotechnical Design

4.4.1. Software Requirements

The PROVIDER shall use programs that are compatible to USACE systems and software. The list of approved software are as follows:

- Geostudio's SLOPE/W
- Rocsience's Settle3

4.4.2. Technical Publications

The following USACE EM's, ETL's, EC's (all available on the internet at: http://www.publications.usace.army.mil/) and other Technical Publications shall be utilized in the Geotechnical design (latest versions shall be used):

1110-2-1902, Slope Stability
EM 1110-2-1904, Settlement Analysis Embankments and Shallow Foundations EM
1110-1-1905 Bearing Capacity of Soils
EM 1110-2-1906, Laboratory Testing
EM 1110-1-1804, Geotechnical Investigations
DIVR 1110-1-400, Soil Mechanic Data

4.4.3. Geotechnical Soil Parameter Development

Laboratory test results and CPT data collected shall be processed and reviewed to develop strength, moisture, unit weight, and settlement characteristic profiles for use in geotechnical engineering analyses. Subsurface profiles and associated soil parameters shall be submitted for approval by the GLO/USACE prior to any geotechnical analysis being performed. Up to two (2) design soil profiles may be developed.

4.4.4. Geotechnical Analysis

Analyses of the breakwaters shall be performed for up to two (2) mudlines per design soil profile and will include the following:

- Slope stability analyses to evaluate the geometry required for a stable configuration
- Bearing capacity evaluations
- Sliding evaluations
- Settlement analyses

The analysis shall consider mudwaving and/or lateral squeezing as well as the use of geotextiles in the design.

Geotechnical analyses shall be performed as hand calculations or utilizing various computer software, such as GeoStudio's SLOPE/W and Rocscience's Settle3.

4.4.5. Geotechnical Reporting

A geotechnical design report shall be prepared to summarize conclusions and recommendations. The geotechnical report shall provide detailed information on the soil models, analyses (including all assumptions), construction considerations, and any factors that may impact the project design or construction. Calculation packages for all analyses shall be included in the submission.

4.5. Cost and Duration Estimates

4.5.1. General

The PROVIDER shall prepare and submit MII cost estimates at 60% and 90% design.

4.5.2. Regulations and Guidance

The following USACE EM's, ETL's, EC's (all available on the internet at: http://www.publications.usace.army.mil/) and other Technical Publications shall be utilized in creating the cost estimate (latest versions shall be used):

ER 1110-1-1300, Engineering and Design Cost Engineering Policy and General Requirements
ER 1110-2-1302, Civil Works Cost Engineering
EP 1110-1-8, Construction Equipment Ownership and Operating Expense Schedule ER 1110-2-1150, Engineering and Design for Civil Works Projects
EM 1110-2-1304: Civil Works Construction Cost Index System (CWCCIS) UFC 3-740-05 Engineering Instructions, Construction Cost Estimating

Other cost regulations and USACE guidance may also be applicable in addition to the aforementioned and can be referenced at:

http://www.hq.usace.army.mil/cemp/e/ec/ec-regs.htm.
https://www.usace.army.mil/publications/.

4.5.3. Detailed Cost Estimating

Detailed Cost Estimating and duration requirements include:

Cost Estimating Software. The estimate shall be done using the current proven version of the Corps of Engineers MII cost estimating software. *This software can be provided by the USACE at no cost for the software; however, the PROVIDER will have to purchase the latest cost databases.* Microsoft Excel 2013 or later spreadsheet software is desirable for use in quantity computations and supporting calculations that cannot be performed practically in the MII software. The use of these tools does not negate the responsibility of the Cost Engineer to use professional judgment and quality checks in all cost computations.

Durations from the detailed cost estimate shall be utilized to achieve a realistic construction schedule based upon the crews assumed to build the project.

4.6. Agency Reviews

In accordance with USACE's Review Plan, which will be provided as GFI, the deliverables required by this WORK ORDER will undergo Quality Assurance (QA) Review and Agency Technical Review (ATR). QA will be performed by USACE Galveston and GLO (to include their representatives), and the ATR will be performed by USACE representatives outside of the region.

5. REQUIREMENTS FOR PLANS & SPECIFICATIONS

5.1. General Drawings Requirements

The PROVIDER shall prepare full size CADD plans (drawings) utilizing AutoCAD Civil3D.

The PROVIDER shall contact GLO/USACE prior to starting work if there are any questions concerning CAD standards. The developed sheets shall be in two-dimensional format.

5.2. Survey Plats and Civil Site Plans (Drawings and Plates)

The working units for the design files shall be set with master units as survey feet and sub-units as survey inch. The resolution shall be set at 304800 units per U.S. survey foot. The drawings shall be prepared on 22-inch by 34-inch sheets (ANSI D) with the USACE's standard border and title block. The PROVIDER shall be required to have their registered Texas Professional Engineer stamp, and sign each sheet of civil site plans for which they are responsible for. The PROVIDER shall be required to have their registered Texas Professional Land Surveyor stamp, and sign each sheet of survey plats for which they are responsible for.

5.3. Drawing List

The drawing set shall include, as a minimum, the following: The

Standard Cover Sheet from the USACE.

The site vicinity, location map, legend, abbreviations, general notes and an index of drawings.

Sufficient general site plans that shows construction access routes, all utilities, relocations, temporary items, proposed permanent work, existing contours/topography, borrow/disposal areas and rights-of-way.

Traffic, detour, and construction access plans (if needed).

Sufficient plans, elevations, sections, and details of the various components of the proposed structure (i.e. breakwater, aids to navigation, etc.) construction, stockpile areas, drainage culverts and ditches, road works, and other required utilities to construct the proposed permanent and temporary features and to compute detailed quantities.

5.4. ROW Drawings

The ROW drawings to be prepared by the PROVIDER for inclusion into the plans shall include the temporary work area easement(s) for construction purposes and the property boundaries of the area for the contract. Independent of the construction contract documents, a separate drawing will be created by the PROVIDER for use in acquiring the real estate for construction purposes and shall include any easements necessary to perform construction activities. Real estate drawings developed for this effort shall be a separate section within the plan drawing package. ROW drawing submittals shall comply with ECB Civil works Design Milestone Checklist 2023-9.

5.5. Contract Specifications

The PROVIDER shall prepare the contract specifications for construction of the project features for this SOW. The technical provisions shall consist of a master technical specification covering all items of work and shall include separate sections covering the various trades and work classifications in accordance with the Construction Specifications Institute (CSI) Forty-nine Division Format. The specifications shall meet the requirements of ER 1110-1-1855: Engineering and Design, Specifications. The Contractor shall prepare draft and final technical provisions for specifications using Unified Facilities Guide Specifications (UFGS). References are used for ASTM's and industry standards. The contract specifications shall be prepared using SPECSINTACT software with Standard Generalized Markup Language (SGML) tagging system. The Specs Intact Software can be downloaded from http://specsintact.ksc.nasa.gov/software/software.htm at no expense to the PROVIDER. Questions regarding development of the specifications should be coordinated with the USACE.

551. General instructions

USACE construction contract specifications ordinarily consist of the Invitation for Bids, the Bid Form with its Bidding Schedule, the Contract Clauses, the General Provisions, and the Technical Specifications. The PROVIDER's responsibilities under this contract shall be the Bidding Schedule, the General Provisions, the Technical Specifications, and the Submittal Register (ENG FORM 4288). Sole Source or "brand name" items will not be allowed, approved equal items will be allowed. USACE through GLO will provide the PROVIDER with electronic Division 00 (except for the bid schedule, which is the responsibility of the PROVIDER) specifications to incorporate prior to the 90% submittal. USACE through GLO will provide the PROVIDER with electronic Division 01 specifications at the WORK ORDER Notice to Proceed (NTP), to incorporate in the 60% and all subsequent submittals.

552. General Policy

It is the policy of the USACE to require the highest order of engineering and technique in the preparation of specifications for all civil works projects. Accordingly, all specifications shall be carefully prepared using up-to-date engineering and sound experienced judgment based on the approved design. The specifications shall be so clear and complete that any competent manufacturer or construction firm should experience no difficulty in preparing bids.

553. Trade Names

Technical Specifications shall be written to permit competition. Articles will not be designated by trade names except where it is impracticable to provide other identification for the article desired (i.e., only when items must be compatible with existing items). Whenever possible, however, articles and materials shall be identified by physical and chemical compositions, by test qualifications, by performance conditions, or by similar specifications (i.e., list all salient characteristics necessary to evaluate an equal product). Where it is not possible to avoid use of cut, catalog number, or trade name, such use will be qualified with the phrase "or approved equal," and the salient characteristics of the desired item will be identified to form the basis for evaluating alternative brands. A list of known sources meeting those requirements shall be provided.

554. Guide Specifications

UFGS Guide Specifications shall be utilized to the maximum extent practicable in the preparation of the Technical Specifications for the project. The USACE Unified Facilities Guide Specifications (UFGS) shall serve as the primary Master. In adapting these guide specifications to specific projects, modifications will be made as necessary to provide for local conditions, special project requirements, and new developments and improvements in design or construction techniques. Other Government guide specifications may be used (VA, GSA, etc.) or recognized industry guide specifications (CSI, AIA, etc.) or parts thereof may be incorporated upon approval of the GLO and USACE. The Masters can be obtained upon request to USACE.

555. Editing Specifications Sections

Guide specifications shall be edited in SPECSINTACT with "REVISIONS" turned on. Revisions shall be executed only after submission to the GLO and USACE for review. Before editing specifications as a result of the GLO and USACE's review, "Revisions" shall be executed and again turned on to show subsequent changes. REVISIONS need not be shown in printed documents submitted for review but must be present in electronic copies presented at each level of review and in the final submittal. The PROVIDER shall run Quality Control Reports (Reconciliation and Verification) in SPECSINTACT when editing of a Job is complete. All errors as a result of the QC Reports must be resolved before submission to the GLO and USACE for review or final submission.

- Editing: Each specification used in the preparation of project specifications will be tailored to fit the requirement of the project. Where numbers, symbols, words, phrases, clauses, or sentences are enclosed in brackets [ ], a designer's choice or modification must be made. The PROVIDER shall exercise care in making the choice or modification. Where blank spaces are provided for insertion of data or text, the PROVIDER shall insert the appropriate data or text. Where entire paragraphs are not applicable, they must be deleted. Paragraphs describing systems or materials not used in the construction of the project shall be deleted. When necessary to add requirements, they must be consistent with the other requirements of the specification and must not unnecessarily restrict products that can be furnished. Prior to marking up each specification for the Interim (if this submittal is required) and Final design submittal, the PROVIDER shall review all notes in each specification section.

- Submittal Register: The Submittal Register shall be submitted as part of the specifications. SPECSINTACT allows automatic generation of the Submittal Register when reports are being made. For each Submittal that requires USACE approval, the PROVIDER shall provide the desired reviewing office designation e.g. "RO" for "Resident Office." "AE" should be used for all submittals that are an extension of Design. For example, a submittal that requires USACE Approval by the Design Engineer should be noted in the Submittal paragraph of the specifications as "G, AE". Note the "," between the "G" and "AE" is required in order for the Automated Submittal Register feature function properly.

55.6. Use of Standards

Materials and equipment shall be described, where possible, by documents generally known to the industry. Nationally recognized industry and technical society specifications and standards shall be used to the maximum extent practicable to assure that requirements are compatible with current industrial practices and manufacturing resources. Federal or military specifications and standards shall not be used to describe the requirements, unless they are used in current UFGS guide specifications or otherwise approved by USACE.

Reference to standard specifications shall be to specific editions, including amendments. The date and title of each specification or amendment shall be included in the paragraph entitled "References." Thereafter, each reference to a standard specification will be by basic designation only. Any references to standards, codes, trade names, and manufacturers' catalog numbers should be carefully checked for correctness, applicability to the particular project, and latest version.

General Principles Applicable to Specifications:

Contract specifications shall be carefully prepared to eliminate all conditions or practices which might operate to delay the work or which might result in controversy and subsequent claims.

Specifications shall be prepared such that all probable questions which may arise during the performance of the contract may be determined and settled by reference to the contract, of which the specifications form a part. Unusual or unproven requirements shall be avoided whenever possible. Tolerance and inspection standards will, to the greatest extent possible, conform to standard commercial practice.

55.7. Use of Measurement and/or Payment Paragraphs

The Technical Specifications for a project involving a multiplicity of unit and/or lump-sum prices will include measurement and payment paragraph(s) applicable to the work specified therein. Each Technical Section shall contain a Measurement and Payment paragraph to reference the Measurement and Payment specification section. The measurement and payment section shall be carefully reviewed to assure that measurement and/or payment for each item of the bidding schedule is adequately specified in its appropriate section, organized to allow monitoring of Federal and local costs for each line item. Only items not subject to variation should be paid for as lump-sum items. "Job" items will have detailed payment paragraphs that include a description of the "Job" work, description, and a description of any subsidiary work required for such payment. Items subject to variation should be unit priced and measure.

Measurement paragraphs will include a description of the method and unit of measurement. Payment paragraphs will include its description and a description of any subsidiary work required for such payment. When there are items of work which are incidental to other items of work, the measurement and payment shall indicate that no separate measurement or payment shall be made for that item of

work, but all cost therefore will be included in the ”job” or unit price applicable.

5.5.8. Form Specifications to be furnished to the GLO and USACE:

Specifications shall be developed using version 5.1 of SPECSINTACT and delivered in SPECSINTACT file format (.sec) on a portable hard drive. Project specifications' sections shall be numbered using the Master Format 2010 System (49 Divisions) or as requested by the GLO and USACE.

6. REQUIREMENTS FOR DESIGN DOCUMENTATION REPORT DOCUMENTS

6.1. General DDR

The Design Documentation Report (DDR) shall include the applicable items described in the following paragraphs and any additional information deemed necessary to fully portray the project in accordance with ER 1110-2-1150, Engineering and Design for Civil Works Projects, 31 Aug. 99. The completed report should be adequate to provide the technical basis for the Plans and Specifications and serve as a summary of the design. It shall contain a full record of design decisions, assumptions, and methods. It shall be sufficiently clear so that an engineer or other individual not familiar with the project could review the DDR and understand how the project evolved into its final configuration, and why each key decision was made. It shall be sufficiently detailed for each technical specialty, so that the criteria which were used, the critical assumptions which were made, and the analytical methods which were used will be evident for purposes of review and historical documentation. An AEQR must be completed and signed prior to any submission of documentation. Additional guidance for preparing the DDR can be found in Appendix C of ER 1110-2-1150. The DDR shall be organized using section dividers and numbered pages and any other methods for clear presentation.

6.2. Design Documentation Report Components

6.2.1. Cover Sheet and Table of Contents

A cover sheet and table of contents shall be provided. The table of contents shall include all major paragraph titles, paragraph numbers, page numbers, and a list of appendices and graphical information. The PROVIDER will be required to have all disciplines involved (civil, geotech, and structural) registered Texas Professional Engineers and registered Texas Professional Land Surveyor stamp, and sign the front cover of the document design report.

6.2.2. Write-Up

A write-up for all design, analysis and other work associated with this work order shall be included in the DDR.

6.2.3. Project Description

The project description shall be a summary describing the overall project.

6.2.4. Pertinent Data

A tabular summary of essential data specific to this sub-project and similar in form to that depicted in the GFI Design Memorandum (DM) shall be provided.

6.2.5. Engineering Studies, Investigations, and Design

Descriptions of the results of investigations, analyses, and computations made for the design of all essential major features or components should be included and broken into separate sections by discipline (i.e. Hydraulics, Structural, Geotechnical, Civil, etc.). The results should include the description and data necessary to review and understand the proposed design. Each discipline-specific section should include all references used for those features of design. Basic data and criteria used in all designs (i.e. civil/transportation, structural, geotechnical, hydraulics, etc.), inclusive of the information provided in section 'DESIGN SCOPE AND REFERENCE INFORMATION', herein, referring to applicable engineer manuals and regulations, guide specifications, and other sources of criteria, shall be listed. Also, all load cases and loadings shall be listed and governing load cases shall be discussed for each feature of design. Environmental considerations will result from the compiled environmental studies as described in the WBS in Section 1.1 and will be included in the DDR.

6.2.6. Real Estate

The proposed rights-of-way requirements and all existing, site specific, real estate information shall be presented and noted if different from that furnished by the GLO and USACE.

6.2.7. Relocations

The PROVIDER, with support from the GLO and USACE, will provide the input to the relocations plan and relevant language to include into the specs and DDR. A Relocations Plan shall be submitted by the PROVIDER and included in the DDR.

6.2.8. Geotechnical Report

The geotechnical report, inclusive of all write-ups, assumptions, calculations, verifications and PLATES shall be included in the DDR as an appendix to satisfy the Geotechnical input requirements.

6.2.9. Design Calculations

Design calculations shall be included as an appendix and shall comply with the requirements of this SOW. The design calculations presented in the DDR should present the designs for major features of work.

6.2.10. Quantity Estimates

The detailed quantity calculations shall be included as an appendix.

6.2.11. Cost Estimate

A detailed cost estimate of the proposed work shall be presented under separate cover from the DDR

6.2.12. Correspondence

Copies of pertinent correspondence or any other documentation such as the required coordination with utility owners and/or manufacturers concerning items presented in the design should be presented.

6.2.13. Technical Review Documentation

All DrCheck comments and subsequent resolutions resulting from the scheduled reviews shall be

included as an appendix. Also, the PROVIDER shall include the results of all AE Quality Reviews performed, inclusive of comments and their resolutions.

6.2.14. Photographs

The PROVIDER may include any photographs of the existing site as an appendix.

6.2.15. Drawings

Drawings sufficient to depict the major features of work shall be included as design plates. The plates shall make use of the Contract Drawings to the greatest extent possible, to avoid duplication of effort. The format shall be as described in Section 'REQUIREMENTS FOR PLANS AND SPECIFICATIONS'.

Text Format: Text material for the design report shall be 8½ by 11 inch (or 11 by 17 inch, fan-folded for calculations, if necessary) white plain paper with not less than a one-inch binding margin on the eleven-inch side. Text material may be printed (if required) on both sides of the pages if desirable and practicable.

Plates Format: Plates shall be 11 by 17-inch, fan-folded, white plain paper prints of select Contract Drawings. The PLATES as printed need not be to scale. However, the electronic files of the PLATES shall comply with the requirements for the Contract drawings as described in Section 'REQUIREMENTS FOR PLANS AND SPECIFICATIONS'.

7. CONTRACT SUBMITTALS

7.1. General

This section addresses the various items required to be submitted, including plan drawings, ROW drawings, specifications, design calculations and models, survey data, geotechnical report, design document report and detailed quantity estimates. Table 2 is presented listing the number of sets required per submittal and minimum requirements as outlined for the 10%, 30%, 60%, and 90% submittals.

7.2. Submittal Format

The PROVIDER shall provide all submitted files in an electronic pdf and native format (Word, Excel, MathCad, etc.). All electronic files provided to the GLO and USACE shall be in their unlocked state.

7.3. Certification of Computer Media

The PROVIDER shall certify that all files submitted and the delivery media in which they are transmitted are free of known computer viruses and malware. If the GLO or USACE finds evidence the files or delivery media are infected, they will be returned to the PROVIDER.

7.4. Minimum Submittal Requirements

The submittals shall conform to ECB 2023-9 Civil Works Design Milestone Checklist (07/20/23). Structural, mechanical/electrical and architectural analysis are not applicable to the project.

The following items are inherently internal to the USACE and are assumed to be performed by the USACE:

- Approved Review Plan
- Cost Analysis / Cost and Schedule Risk Assessment (CSRA)
- MCX Coordination

- Real Estate Certification for Construction
- Acquisition Strategy
- Construction Management Plan & EDC Strategy
- Resourcing Strategy and Schedule for updating the DDR Post-Construction.

The minimum information for each required contract submittal are as follows:

7.4.1. Minimum Requirements for the 10% Submittal

This submittal shall contain the Initial Risk Register, Phase 1 ESA, Survey and Mapping plan, Geotechnical Investigation Plan, Cultural Resources Desktop Analysis, T&E Species Desktop Habitat Assessment, Basis of Design Report, and all required ROE drawings for the field investigations. Based on the collected data, an Assessment of Permits will be conducted, however, any additional work identified in support of permitting will need to be amended to this SOW. This submittal shall include the beginning of the initial assessment and evaluation on all existing project features.

The APP shall cover all field investigations and comply with the requirements of Engineer Manual 385-1-1, Safety and Health Requirements Manual. Notice to proceed for geotechnical investigations will be subject to approval of a DPP and safety plan.

The 10% submittal requires formal approval by the GLO and USACE. The submittal will not be approved until all GLO and USACE comments and concerns have been addressed.

7.4.2. Minimum Requirements for the 30% Submittal

This submittal shall contain at a minimum an updated Risk Register, a draft of the geotechnical report (draft), 30% DDR, wave modeling report (draft), construction plans, and specification table of contents. All utilities shall be verified within the ROW limits, and facilities that will be impacted by project features and/or construction activities that will require relocations actions shall be identified as described in the Paragraph 'Real Estate' under Section 'DELIVERABLES/SPECIFIC WORK ITEMS REQUIRED'. Evaluation of utilities shall be complete and justification of required relocations shall be presented in the submittal. The geotechnical report will include geotechnical background introduction for the project, preliminary charts of the geotechnical engineering properties lines (strength, dry unit weight, moisture content, consolidation, etc) by elevation and depth, table summary of the generalized subsurface profiles for each reach, written description of the generalized subsurface profiles, and all geotechnical explorations and laboratory results. This effort will be prepared using GLO or USACE-furnished geotechnical investigation data and all additional geotechnical information developed for this SOW. The preliminary dimensions and layout for all structures shall be complete. The project description, pertinent data, references, ROW, and relocations portions of the DDR shall be substantially complete with the engineering studies, investigations, and design and cost portions of the DDR at a 30% level of completion. The ROW drawings and survey data shall be at a 90% completion level.

7.4.3. Minimum Requirements for the 60% Submittal

This submittal shall contain at a minimum an updated risk register, draft value engineering report, geotechnical report (60%), DDR (60%), wave modeling report (final), MII cost estimate (60%) construction plans (60%), edited specifications (60%), an outline of the ECIFP, and construction schedule (60%). The plans shall include at a minimum site plans, plan and profiles, typical drawings. Edited red-line specifications shall be provided. The geotechnical report shall include draft printout of model results for all required analysis on all project areas. The DDR shall be substantially complete and

design calculations included for all features of work.

The final ROW drawings shall be submitted with comments incorporated from the 30% review. The Records Index (as stated in Paragraph 'Real Estate Records' above) shall be submitted.

7.4.4. Minimum Requirements for the 90% Submittal

This submittal shall contain at a minimum final value engineering report, geotechnical report (90%), DDR (90%), MII cost estimate (90%) construction plans (90%), edited specifications (90%), an draft ECIFP, and construction schedule (90%). Comments resulting from the 60% reviews shall be incorporated in accordance with the final resolutions. The geotechnical report, plans, specifications, ECIFP, and DDR shall be complete except for comments incorporation from this review. The geotechnical report shall be in a final format and contain all geotechnical design calculations. The 90% submittal shall also contain the following:

Draft Quantities in Excel (or compatible) spreadsheet format including the 90% design; structured according to the Bid Schedule
Draft MII detailed cost estimate based upon 90% design
Draft Construction tab and durations (excluding weather days) based upon MII design cost estimate
Inclusion of existing facilities, the proposed relocations, and final relocation plan language
Statement of Completion of AEQR for P&S and DDR

7.4.5. Submission Requirements

Table 2: Number of Sets Required Per Submission

Document	Submission	Media					
		Blackline Prints		Electronic Documents			Bound Sets (Text Documents)
		Full Size	Half-Size	.PDF	(.DOC; .XLSX)	(.DWG)	
DQCP	Pre 10%			1	1	-	-
Survey and Geotechnical Investigation Plan	Pre 10%			1	1	1	-
10% BODR	10%			1	1	1	
Survey	30%			1	1	1	-
DDR, including design calculations **	30%			1	1	-	-
	60%			1	1	-	-
	90%			1	1	-	-
Geotechnical Report **	30%			1	-	1	-
	60%			1	-	1	-
	90%			1	-	1	-
ECIFP	60% (Outline)			1	-	-	-
	90%			1	-	-	-
Detailed Quantity and Cost Estimates (MII)	60%			1	1	-	-
	90%			1	1	-	-

* The quantity estimates will consist of the detailed quantity calculations, inclusive of those items that are quantified in the Bid Schedule and the quantities for the quantifiable Lump Sum items.

** A registered professional engineer shall stamp the final drawing coversheet with a listing of drawing sheets under his/her responsibility in PDF format. Final reproducible drawings shall be submitted after all comments have been incorporated or resolved. The professional register engineer shall also stamp the final Geotechnical Report, final DDR, calculations, and final MII cost estimates.

7.5. Submittal Location

All submittals by the PROVIDER to the GLO and USACE shall be done via a medium agreed upon at project kick-off. Options to consider are: DOD Safe, External USB 3.0 hard drive sent to the GLO and USACE or other Secure File Transfer means.

8. PROJECT SCHEDULE AND MEETINGS

8.1. Conferences and Meetings

The PROVIDER shall at a minimum attend the following conferences and meetings. For each conference or meeting, the PROVIDER shall be responsible for preparing an official set of minutes, which fully describe and document each point presented, any decisions reached, and any follow up action(s) that may be required. The minutes shall be typed and submitted to the GLO and USACE for concurrence within five calendar days following the conference or meeting.

8.2. Kick off Meeting

The PROVIDER will be required to schedule and attend a two day Project Kick off meeting, to include a site visit to the project sites. Attendees for the kick off meeting shall include the PROVIDER's Project Manager and their designated points of contact, in addition to the GLO and USACE's Technical Managers, and any other GLO, USACE and/or Local Interests representatives whose presence is deemed necessary. The purpose of the meeting is to review the SOW and the requirements within it. The PROVIDER will be required to create an agenda and meeting minutes for the kick off meeting.

8.3. Bi-Weekly Progress Meetings

The PROVIDER will be required to schedule and lead bi-weekly (one every two weeks) progress meetings. Progress meetings shall consist of teleconferences. Attendees for the bi-weekly progress meetings shall include the PROVIDER's Project Manager and their designated points of contact, in addition to the GLO and USACE's Technical Managers, and any other GLO, USACE and/or Local Interests representatives whose presence is deemed necessary to discuss any issues that may have arisen.

8.4. Full Package Submittal Kickoff Meeting

The PROVIDER will be required to present an overview of each Submittal (10%, 30%, 60% and 90%) to all necessary reviewers. This meeting shall be scheduled by the PROVIDER, in coordination with the GLO and USACE Technical Managers, within three (3) calendar days of the contract submittal. This meeting should be no longer than 4 hours and is anticipated to be an overview presentation of the submittal addressing all design updates and revisions. The meeting participants may include personnel from various offices within the GLO, USACE, higher authority review offices within USACE, the local interests, and/or any of the other authorities listed in section 'POINTS OF CONTACT' or as deemed necessary by the GLO and USACE.

8.5. Comment Resolution Meetings

The PROVIDER will be required to participate in submittal review conferences either virtually or at the GLO or USACE office to discuss the submittal review comments. These meetings shall occur within 5 calendar days from the review period ending. These conferences will include 10% virtual review meeting, 30% virtual review meeting, 60% virtual review meeting, 90% virtual review meeting. Comment Resolution Meetings shall include addressing comments at the 10%, 30% and 60% design level. The PROVIDER will be required to continue working towards the next design package while the GLO and USACE review processing is going on.

8.6. Site Visits

The PROVIDER's design personnel shall meet with the GLO and USACE personnel and personnel from any of the other authorities listed in section 'POINTS OF CONTACT' at the project sites prior to the commencement of any work by the PROVIDER, during the timeframe of the Kick-off Meeting.

8.7. Project Schedule

The deliverables for the task order shall be submitted in accordance with the Major Milestone Schedule shown below in Table 3 and the detailed schedule as attached. If any of the required schedule days fall onto the weekend or federal holiday, then that task will be extended to the first following weekday. The PROVIDER will be required to continue working towards the next design package while the GLO and USACE review processing is going on.

The GLO will provide ROEs within 30 days of NTP. If there is a delay, the GLO will adjust the WORK ORDER Period of Performance/Schedule.

Table 3: Project Design Schedule – Major Milestones

Work Item	Time Interval For Work Item In Calendar Days	Time in Calendar Days From Date of Task Order Award
NTP	0	**0**
Draft DQCP	6	**6**
Final DQCP	14	**20**
10% Design Submittal	19	**39**
30% Design Submittal	149	**188**
60% Design Submittal	59	**247**
90% Design Submittal	63	**310**
90% Comment Resolution	37	**347**

9. DESIGN QUALITY CONTROL PLAN (DQCP)/QUALITY MANAGEMENT

9.1. General

The PROVIDER shall prepare and maintain an effective quality control program that will assure that all services, designs and drawings, required by this task order are performed, reviewed and provided in a manner that meets professional engineering quality standards. The following regulations apply:

ER 1110-1-12: Engineering & Design, Quality Management, 30 September 2006 ER 1110-1-8159: Engineering and Design, DrChecks, 1 January 2015

9.2. Design Quality Control Plan

The PROVIDER shall prepare a Design Quality Control Plan (DQCP) in accordance with ER 1110-1-12. The PROVIDER can obtain an example DQCP template from USACE through GLO. The DQCP shall be submitted prior to the 10% design submittal report to USACE through GLO for review and acceptance. It shall present the policy and specific actions that will be implemented by the PROVIDER in the design and contract document preparation for this WORK ORDER, and be updated as necessary to incorporate changes during WORK ORDER work, members change, or if the SOW is modified or expanded. It provides a means for internal checks, reviews, and corrections and identifies specific project feature that require special consideration.

9.3. Implementation

The DQCP shall be implemented by an assigned person within the PROVIDER's organization who has the responsibility of being present during the work in progress, shall be cognizant and assure coordination of all documents for the project. This individual shall be a person who has verifiable engineering design experience and is a registered professional engineer. The PROVIDER shall notify the GLO and USACE of the name of the individual and the name of an alternate person assigned to the position.

9.4. A-E Quality Review (AEQR)

AEQR will be a continual process with formal reviews coordinated with the PROVIDER's Project Delivery Team (PDT) at critical points. The PROVIDER's AEQR person or team shall have expertise in disciplines involved in the type of product being developed and reviewed and shall be registered Professional Engineer(s) or Senior Scientist(s), as applicable for the work product. A-E Quality Control review comments will be captured during A-E QC reviews, incorporated, and backchecked for acceptance by the AEQR Team before the PROVIDER's AEQR Certificate is signed for inclusion in the 30%, 60% and 90% Submittal to the USACE/GLO.

At the 90% design stage an additional A-E Independent Technical Review (ITR) will be conducted. The PROVIDER's A-E ITR person or team shall not be affiliated with the development or design of the contract services. All ITR comments will give a clear statement of the concern, the basis of the concern, and when appropriate, the actions necessary to resolve the concern. The PROVIDER's PDT will evaluate and respond to each comment. Responses will clearly state concurrence or nonconcurrence with the comment. Concurrences shall include what the corrective action is and where and what will be done. All comments will be addressed, backchecked and accepted by the ITR Reviewer(s) as resolved, before the PROVIDER's A-E ITR Certificate is signed. The ITR Completion Certificate will accompany the 90% Submittal.

9.5. USACE Reviews

USACE will conduct QA on the project plan according to the Uniform Federal Policy for Quality Assurance Project Plans (UFP QAAP) that is required for all federal projects

USACE reviews will include Quality Assurance (QA) Review and Agency Technical Review (ATR); **All reviews (unless noted otherwise) will use DrChecks as the tool for comments, comment responses and backcheck**. The Technical Manager will coordinate with the PROVIDER to setup each review for responses to comments. The PROVIDER will be required to respond to comments generated from all reviews at 10%, 30%, 60% and 90% Design Deliverables.

A Design Review Meeting will be scheduled within 3 calendar days from the 10%, 30%, 60% and 90% Design Submittals to USACE/GLO to facilitate an efficient review of the respective deliverable. Meeting Minutes will be prepared by the PROVIDER to document directives from the Review Meeting.

The USACE and GLO will be responsible for providing the comments to the PROVIDER within 21 calendar days and the PROVIDER shall be responsible for responding to all comments within 14 calendar days. A DrChecks Comment Resolution Meeting will be scheduled within 5 calendar days of the USACE/GLO comment period closing to facilitate efficient comment response and closure. All necessary modifications shall be incorporated (if appropriate) into the next design deliverables.

After the GLO and USACE has been satisfied, the deliverable shall be identified as approved.

The PROVIDER shall maintain professional responsibility and liability for the deliverables. If, in the PROVIDER's professional opinion, a QA comment either does not apply or the PROVIDER disagrees with it, then the PROVIDER shall not incorporate that comment into the deliverables. The PROVIDER shall respond to the comment "Do not concur." and provide the comment submitter with an explanation of the disagreement. The PROVIDER shall also be prepared to discuss the position with the reviewer.

9.5.1. Investigation Plans at 10%

The minimum requirements for the review are listed above in section 'CONTRACT SUBMITTALS'. The function of the review is to give the GLO/USACE a review to express their comments and concerns. Comments generated in the 10% review shall be addressed in backcheck prior to the notice to proceed is given for the geotechnical investigations, and surveys.

9.5.2. Quality Assurance Review (QA)

A QA Review will be conducted at the 10%, 30%, 60%, and 90% review stages. The minimum requirements for the reviews are listed above in section 'CONTRACT SUBMITTALS'. The function of the review is to give the GLO/USACE a review to express their comments and concerns. Comments generated from the 10, 30 and 60% reviews shall be resolved with necessary changes to the design package prior to the next submittal.

9.5.3. Agency Technical Review (ATR)

An ATR will be conducted concurrently with the 90% review. The minimum requirements for the reviews are listed above in section 'CONTRACT SUBMITTALS'. The function of this review is for the USACE to ensure the quality and credibility of the scientific information consistent with EC 1165-2-217. Comments generated from the ATR review shall be reviewed and recommendations for resolution shall be made for incorporation during the 100% design phase, which is not part of this scope of work.

10. GENERAL PROVISIONS

10.1. Verification of Site Conditions

The PROVIDER shall review the existing documents pertaining to the site and shall visit the site and its immediate vicinity to evaluate and verify existing and future conditions. The PROVIDER shall determine if such conditions may affect, or be affected by proposed construction.

11. GOVERNMENT FURNISHED INFORMATION

11.1 Documents Furnished by the Government

The following documents will be provided by USACE through GLO as Government Furnished Information (GFI) for the PROVIDER's use in preparing the design documents (number of pages/file types included):

- DDR Template
- ECIFP Template
- Specification Division 00
- Specification Division 01
- Example Real Estate Records Index (Excel File)
- Example Real Estate Index
- Typical Relocation Plans (PDF), if required

11.2. Verification of Government Furnished Information

The PROVIDER shall thoroughly review and verify the GLO and USACE furnished data along with other communications concerning this project that occurred prior to the contract date. Any conflict or omission discovered by the PROVIDER between the GLO and USACE's supplied data, and applicable codes, Government regulations, and the above referenced communications, shall be transmitted in writing to the GLO within 5 days of the discovery. Failure of the PROVIDER to review the GFIs will not relieve the PROVIDER of delivering correct plans within the time frames discussed in section 'PROJECT SCHEDULE AND MEETINGS'. Additional work that is required due to the failure to review the furnished data will not be grounds for additional time or compensation.

MEMORANDUM

TEXAS GENERAL LAND OFFICE • COMMISSIONER DAWN BUCKINGHAM, M.D.

Date: 3/11/2025

To: Coalter Baker

From: Sarah Purdon

CC: Ross Gordon, Duggan Baker, Dedrea Norman, Tony Williams, Abigail Richardson

Subject: GLO Contract No. 25-025-000-E784 Request to Amend Attachment B

This memo for the file serves to request an amendment to Attachment B for contract number 25-025-000-E784, and to provide context for the requested funding needed to cover the work necessary for Phase I of the Work Order (WO) with Ducks Unlimited (DU) while documenting the fee of such work. This proposed amendment to Attachment B includes the USACE-approved Scope of Work (SOW) for all work to be performed under this project; however, the provided fee only covers the first phase of this effort, which effectively excludes boundary surveys and ROW drawing tasks. GLO and GCPD will subsequently need to amend this agreement to provide additional funds to the project to complete those excluded tasks.

The current fee for Phase I of our WO with DU is $1,945,391.17, please see DU provided fee breakdown below.

Total Contract Costs - G28-1 Shoreline Protection		
Professional Services Estimate		
DU Professional Services		
Project Phase		**Cost**
Section 1: DQCP & Site Visit		$33,309.50
Section 2: 10% BODR		$104,744.00
Section 3: Field Investigations		$2,144.00
Section 4: 30% Design Submittal		$98,400.00
Section 5: 30% Design Review Meeting		$17,600.00
Section 6: 60% Design Submittal (Includes VE Workshop Time)		$141,184.00
Section 7: 60% Design Review Meeting		$22,212.00
Section 8: 90% Design Submittal		$145,104.00
Section 9: 90% ATR Review Meeting		$22,212.00
Indirects		$52,658.98
Subtotal		**$639,568.48**
Subconsultant Professional Services		
Services Required	**Subconsultant**	**Cost**
Survey Services	T Baker Smith	$136,200.00
Engineering Services	Freese and Nichols	$862,000.00
Value Engineering Services	SVS Inc.	$146,372.69
Geotechnical Field Data Collection	GeoEngineers, Inc.	$111,100.00
Indirects		$50,150.00
Subtotal		**$1,305,822.69**
Professional Services Total:		**$1,945,391.17**
Total Contract Cost:		**$1,945,391.17**

MEMORANDUM

TEXAS GENERAL LAND OFFICE • COMMISSIONER DAWN BUCKINGHAM, M.D.

GLO is requesting to amend Attachment B of this contract to include the provided SOW, and for GCPD to submit an advance request for $1,945,391.17 in order for GLO to enter into the Phase I WO with DU.

Sincerely,

Sarah Purdon

Sarah Purdon

Coastal Texas Project Manager

Certificate Of Completion

Envelope Id: 5DC9BA3B-E3AF-4B31-BED4-BFB6B6ECD88A
Status: Completed
Subject: Att. B Signatures: 25-025-000-E784 Gulf Coast Protection District (Texas GLO)
Source Envelope:
Document Pages: 43
Signatures: 0
Certificate Pages: 2
Initials: 2
AutoNav: Enabled
EnvelopeId Stamping: Enabled
Time Zone: (UTC-06:00) Central Time (US & Canada)

Envelope Originator:
Clay Sebek
1700 Congress Ave
Austin, TX 78701
Clay.Sebek@glo.texas.gov
IP Address: 204.65.210.164

Record Tracking

Status: Original
3/12/2025 9:46:17 AM
Holder: Clay Sebek
Clay.Sebek@glo.texas.gov
Location: DocuSign

Signer Events	Signature	Timestamp
J Coalter Baker coalter.baker@gcpdtexas.com Security Level: Email, Account Authentication (None)	Initial  Signature Adoption: Pre-selected Style Using IP Address: 12.217.183.98	Sent: 3/12/2025 1:33:46 PM Viewed: 3/12/2025 1:34:02 PM Signed: 3/13/2025 9:21:25 AM
Electronic Record and Signature Disclosure: Not Offered via Docusign		
Sarah Purdon Sarah.Purdon@glo.texas.gov Security Level: Email, Account Authentication (None)	Initial  Signature Adoption: Pre-selected Style Using IP Address: 136.60.27.12	Sent: 3/13/2025 9:21:29 AM Viewed: 3/13/2025 9:21:54 AM Signed: 3/13/2025 9:23:02 AM
Electronic Record and Signature Disclosure: Not Offered via Docusign		

In Person Signer Events	Signature	Timestamp

Editor Delivery Events	Status	Timestamp

Agent Delivery Events	Status	Timestamp

Intermediary Delivery Events	Status	Timestamp

Certified Delivery Events	Status	Timestamp

Carbon Copy Events	Status	Timestamp
Clay Sebek clay.sebek@glo.texas.gov Team Lead, General Contracts Security Level: Email, Account Authentication (None)	COPIED	Sent: 3/12/2025 1:33:45 PM
Electronic Record and Signature Disclosure: Not Offered via Docusign		

Carbon Copy Events	Status	Timestamp
CMD Drafting Request draftingrequests@glo.texas.gov Texas General Land Office Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	COPIED	Sent: 3/12/2025 1:33:45 PM
Kelly McBride kelly.mcbride@glo.texas.gov Director of CMD Texas General Land Office Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	COPIED	Sent: 3/12/2025 1:33:46 PM
Lance White lance.white@glo.texas.gov Manager, Contracts Management Division Texas General Land Office Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	COPIED	Sent: 3/12/2025 1:33:45 PM
Payton Ray payton.ray@glo.texas.gov Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	COPIED	Sent: 3/13/2025 9:23:05 AM
Abigail Richardson Abigail.Richardson@glo.texas.gov Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	COPIED	Sent: 3/13/2025 9:23:06 AM
Tony Williams tony.williams@glo.texas.gov Deputy Director Coastal Field Operations Texas General Land Office Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	COPIED	Sent: 3/13/2025 9:23:06 AM

Witness Events	Signature	Timestamp

Notary Events	Signature	Timestamp

Envelope Summary Events	Status	Timestamps
Envelope Sent	Hashed/Encrypted	3/12/2025 1:33:46 PM
Certified Delivered	Security Checked	3/13/2025 9:21:54 AM
Signing Complete	Security Checked	3/13/2025 9:23:02 AM
Completed	Security Checked	3/13/2025 9:23:06 AM

Payment Events	Status	Timestamps