# Partner’s Point Seawall – Final Submittal

## TABLE OF CONTENTS FOR CONSTRUCTION SPECIFICATIONS

<table>
<thead>
<tr>
<th>Division</th>
<th>Section</th>
<th>Page</th>
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BLM Specifications Update: 05/18/16

SPECIFICATIONS Page 1 of 160

Stantec Consulting Services Inc.
Partners Point Seawall – L14PD01347

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SECTION 00 30 00 – AVAILABLE INFORMATION

PART 1 - GENERAL

1.1 SUMMARY

A. Summary of available information and reports for the project site and proposed improvements.

B. PRELIMINARY SCHEDULES

   1. Preliminary Contract Duration: 120 Calendar Days; Contract Period of Performance will be approved at time of Contract Award.

      a. Preliminary Contract Milestones to be included on Contract/Construction Schedule(s)
         1) Contract Award
         2) PreWork Meeting
         3) PreWork Submittals:
            a) Construction Schedule;
            b) Safety/Health/First Aid Plans;
            c) Erosion and Sediment Control Plan
         4) Mobilization
         5) Construction Stake-Out survey
         6) Final Inspection and Final Cleaning
         7) End Construction
         8) Final Payment Request
         9) Final Payment

      b. Preliminary Construction Milestones to be included on Contract/Construction Schedule(s):
         1) Start Construction
         2) Site Fencing and Demolition
         3) Pre-Dredge Survey
         4) Earthwork preparation and Pile Driving Operation
         5) Concrete deck and retaining walls
         6) End Construction
         7) As-Built Survey(s)

      c. Preliminary Schedule of Values: Blank template for Contractor included with the Solicitation.
      d. Preliminary Bid Schedule: Blank template for Contractor included with the Solicitation.
      e. Preliminary Submittals Schedule: Blank template for Contractor included with the Solicitation.

B. EXISTING CONDITIONS INFORMATION

   1. Existing Minor Site Improvements: existing improvements except the river rock shown on the drawings are scheduled for removal and disposal by landfill or recycling.

   2. Existing Utilities: The government has no knowledge of existing overhead or underground utility systems within the project limits.

   3. Traffic Information: Throughout construction, government operations adjacent to the seawall project site at Partner’s Point will include product deliveries, garbage, trash and recycling collections, boat loading/unloading at the ramp, and ingress/egress of government employees and volunteers.
C. SURVEY INFORMATION
   1. Site Survey Information: Control Points are shown on the drawings; raw data file is available upon request.
   2. Measured Drawing Information: Drawings are scalable for quantity take-off when plotted hard copy 24 inches by 36 inches.
   3. Photographic Information: Included with the Solicitation documents.

D. ENVIRONMENTAL ASSESSMENT INFORMATION
   1. There are no known instances of contaminated soils within the project limits.
   2. Record of Environmental Impact Decision: Categorical Exclusion signed by BLM Lake Havasu Field Office is available upon request.

E. EXISTING MATERIALS INFORMATION
   1. Existing riprap (river rock) may be salvaged and re-used in the finished construction, all other materials indicated for disposal are determined suitable for materials segregation prior to recycling or disposal by landfill.

F. EXISTING HAZARDOUS MATERIALS INFORMATION
   1. There are no known instances of hazardous materials within the project limits

G. GEOPHYSICAL DATA
   1. The Contractor shall review and verify geophysical data specific to the project site. The Government will not be responsible for interpretation of this data.
   2. Seismic Data for Project Site:
      a. Site Class based on Soils Data: D
      b. Seismic Design Category for short-period ground motion parameter: $S_s$, the spectral acceleration for short periods is 0.22g
      c. Seismic Design Category for long-period ground motion parameter: $S_l$, the spectral acceleration for 1-second period is 0.11g
      d. Seismic data resources include, but are not limited to
         United States Geological Survey, Earthquake Hazards Program
         http://earthquake.usgs.gov/
         International Building Code (IBC), most current edition published through the International Code Council (ICC)
         http://publicecodes.cyberregs.com/icod/index.htm
   3. Climate Data:
      a. There are two NOAA/NWS Co-op network climate stations in the basin. The average monthly maximum temperature occurs in July and ranges between 96.6° Fahrenheit at Lake Havasu and 98.5° Fahrenheit at Lake Havasu City. The average monthly minimum temperature occurs in January or December and ranges between 52.9° Fahrenheit at Lake Havasu and 54.5° Fahrenheit at Lake Havasu City.
b. Highest average seasonal rainfall occurs in the winter (January – March). For the period of record used, the highest annual rainfall is 4.82 inches at Lake Havasu and lowest is 2.90 inches at Lake Havasu City.

c. Precipitation data shows average annual rainfall as high as 12 inches in the Mohave Mountains along the eastern basin boundary and as low as four inches along the boundary with California.

d. This basin is one of three basins in the planning area with a range of eight inches between areas of highest and lowest average annual precipitation, the lowest in the planning area.

e. Historical data indicates that the largest storm event within 50 miles of Lake Havasu, Arizona is an F1 Tornado. There are approximately six (6) of these events recorded in the proximity of Lake Havasu within the last 30 years.

f. Climate data resources include, but are not limited to:

   National Oceanic and Atmospheric Administration (NOAA):
   http://www.noaa.gov/

   NOAA National Weather Service (NWS)
   http://www.weather.gov/

   Arizona Department of Water Resources (ADWR):
   http://www.azwater.gov/azdwr/default.aspx

   NOAA/NWS Coop Network:
   http://www.wrec.dri.edu/summary/Climsmaz.html

   Spatial Climate Analysis Service (SCAS) Precipitation Data:
   http://prism.oregonstate.edu/

4. Lake Data:

   a. Lake data resources include, but are not limited to:

      Bureau of Reclamation, River Operations
      http://www.usbr.gov/lc/riverops.html

H. GEOTECHNICAL DATA

1. The Contractor shall review and verify geotechnical data for the project site. The Government will not be responsible for interpretation of this data.

2. Geotechnical Report: "Geotechnical Evaluation, Sheet Pile Shoring Protection, Lake Havasu Blue Bird Camp (Partner’s Point) Report" by Western Technologies, dated October 16, 2000 is included with the Solicitation. Soils for this report were sampled at locations immediately adjacent to the project limits.

3. Geotechnical Report: “Geotechnical Evaluation Report, Partners Point Seawall” by Western Technologies, dated July 8, 2015 is included with the Solicitation. Soils for this report were sampled at locations within the project limits.

I. PERMIT APPLICATIONS

1. The Bureau of Land Management (BLM) has coordinated to provide water for construction purposes from Lake Havasu for this contract. The Jurisdictional Agency is Bureau of Reclamation (BOR).

a. The Government has made application for permit as required by NPDES for construction activities within a navigable waterway. Jurisdictional Agency is US Army Corps of Engineers.

b. The Jurisdictional Agency for NPDES regarding storm water runoff from construction sites is Arizona Department of Environmental Quality, Water Quality Division according to their Arizona Discharge Elimination System (AZDES). A permit is not required for this project:
   1) This project has less than one (1) acre of disturbance; and, the horizontal distance from the project site to navigable waters is essentially negligible;
   2) Lake Havasu and the reach of Colorado River in this area are not designed Impaired Waters;
   3) Arizona SWPPP Checklist is included with the Solicitation for Contractor’s use in determining best management practices for the erosion and sediment controls required.

3. Clean Air Act: Arizona Department of Environmental Quality administers the Air Quality Program in the area of the project. Project size and jurisdictional regulations or delegations from EPA to States and local governments do not indicate a requirement for permitting at this time.

4. No other permit requirements are known at the time of solicitation for this project. Notify the Contracting Officer immediately upon discovery if circumstances that necessitate a permit from other jurisdictional authorities arise or are found during progression of the Work.
   a. Refer to Section – “Special Procedures”, “Temporary Facilities and Controls”, and “Performance Requirements” for additional Contract requirements relating to sustainability, environmental protection, the Clean Water Act and the Clean Air Act.

J. PERMITS

1. Permit: USCOE Approval Letter and Section 402 Nationwide Permit Number 13 - Bank Stabilization are included with the Solicitation.


END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY OF WORK

A. WORK COVERED BY THE CONTRACT DOCUMENTS

1. Construction Contract to furnish transportation, fuel, power, labor, equipment and materials to construct a steel, interlocking, segmental retaining sheet pile wall along the shoreline of Lake Havasu at Partners Point work yard. This includes construction stake-out, demolition and removal of existing floating dock and fencing, sheet pile installation, excavation, grading, backfilling and compaction, sheet pile tie-back rod and concrete anchor installation, permanent chain-link fence with gates, concrete slab-on-grade, and concrete retaining wall. Temporary facilities, erosion and sediment controls and fencing are also required.

   a. A Special Project Inspector for steel sheetpile installation shall be provided as part of the Contractor’s Quality Control Operations; refer to SECTION – QUALITY REQUIREMENTS.

2. Project Identification: Partners Point Seawall  WBS # LACPA5890000

   a. Work under this Contract is located on BLM National System of Public Lands in Mohave County, Arizona, adjacent to the City of Lake Havasu, Arizona. Project site is on the shoreline of Lake Havasu.

   b. Lake Havasu is man-made, impounded behind Parker Dam on the Colorado River.

B. GOVERNMENT FURNISHED PRODUCTS


1.2 WORK RESTRICTIONS

A. ACCESS TO WORK SITE

1. Directions: BLM Lake Havasu Field Office (LHFO) is located at 2610 Sweetwater Avenue, Lake Havasu City, Arizona 86406. Once at LHFO, travel west approximately 1/4 mile along Sweetwater Avenue to the apparent end of the road where it actually makes a 90 degree turn to the south towards the lake. Travel south approximately 1.2 miles on the aggregate surfaced roadway to the Partner’s Point Work Yard. Project Site is immediately east of the operations and boat ramp areas.

   a. There is a steep grade/grade dip at the entrance to the Work Yard; verify in advance that materials and equipment delivery vehicles can negotiate this road feature in both directions.

B. COORDINATION WITH OCCUPANTS

1. General: Coordination between Occupants and Contractor will be through the Government’s Contracting Officer and the Government’s Contracting Officer’s Representative.

2. Full Government Occupancy: The Government will continue operations and will occupy Partner’s Point Work Yard and the buildings immediately adjacent to project site throughout entire Contract.

3. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Government and/or authorities having jurisdiction.

   a. Cooperate with Government during construction operations to minimize conflicts, facilitate Government operations and so as not to interfere with Government operations.

   b. Provide minimum 72 hours advance notice to CO of activities that will impact normal Gov operations.
C. USE OF SITE

1. The Government will provide access for the Contractor to the proposed project locations.

2. Site access and parking areas at the Partner’s Point Work Yard are limited to Government and Volunteers. The Contractor shall use the upper parking and storage area located outside the Work Yard Gate and alongside the access road for vehicle parking and may use this area to stockpile materials that are too large or bulky to place in the immediate work area and stage equipment. The Government will field identify and mark these areas for temporary fencing limits. See attached.

3. The Contractor may not use Government buildings or systems located at or serving Partner’s Point Work Yard in conjunction with this Contract except to facilitate emergency response.

4. Limit use of the site and construction activities to the areas described in the specifications or shown on the drawings. Do not disturb areas outside project limits.

5. Each worksite shall be restricted from entry by unauthorized personnel through use of warning and identification signs, mesh and/or field fencing, chain-link fencing, construction barricades or other devices approved through the Safety Plan or as field-approved by the Contracting Officer.

6. Work camps are not permitted in conjunction with this Contract.

7. Explosives are not permitted for use on this project.

8. Driveways and Entrances:

9. Keep driveways, loading areas, and entrances to the site clear and available to Government employees and volunteers, and emergency vehicles at all times.

10. Do not use these areas for parking or stockpiling materials.

11. Schedule deliveries to minimize use of driveways and entrances

12. Coordinate work and delivery schedules to minimize space and time requirements for stockpile materials and staged equipment.

13. Schedule operations so that Work is conducted during daylight hours from 7:00 AM – 4:30 PM Monday through Friday, except Recognized Federal Holidays or as otherwise approved in writing by the Contracting Officer.

14. This work site will not be available on Federal Holidays or Saturday and Sunday unless prior arrangements have been approved in writing by the CO.

15. Submit an updated Work Schedule within three (3) business days of a request from CO or COR.
16. Schedule and sequence operations necessary to complete the work, including coordination with other crafts relative to the Contractor's requirements in such manner as to complete the work according to the approved schedule, avoid delays in overall construction and allow proper installation of work.

1.3 PROJECT UTILITY SOURCES

A. General:

1. Refer to SECTION – TEMPORARY FACILITIES AND CONTROLS for installation and removal requirements for temporary utility connections for construction purposes.

2. The Government has no knowledge of underground utilities of any type within project limits and has not performed utility locating activities within project limits. The Contractor may locate utilities to their satisfaction within the project limits prior to commencing construction.

B. Water:

1. Water for Construction: Water for construction is available at the project site. Contractor shall be responsible for providing equipment and devices necessary to draft water from the lake and meter and document the water volume used with construction activities. Contractor shall not include cost of water used for construction in cost proposals for this Work.

   a. Water for construction purposes is available from Lake Havasu at the construction site under an Interagency Agreement with the Bureau of Reclamation titled “Agreement for the Delivery of Water on Federal Lands in Arizona Administered by the Bureau of Land Management”. The agreement number is 8-07-30-WO373; see attached letter.

   b. Contractor shall provide devices and equipment necessary to draft water from the lake; temporary installation shall be metered. Provide documentation of water volume used from the lake at each progress meeting.

2. Water for Drinking: Water for drinking is not available for Contractor use. Contractor shall be responsible for providing drinking water for construction employees.

C. Electrical Service for Construction Purposes:

1. Existing electrical systems are photovoltaic and cannot support the project work. Contractor shall be responsible for providing temporary power to perform the Work.

D. Communications Service for Construction Purposes:

1. Cellular phone service is available at the site; coverage varies by provider. Contractor shall be responsible for providing communications service to perform the Work.

E. Sanitary Services for Construction Purposes:

1. A restroom is not available for Contractor use. Contractor shall be responsible for providing temporary toilet and associated cleaning and pumping services for construction employees.
PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes requirements for unit prices and requirements to prepare schedule of values.

B. The procedures described in this Section do not supersede or replace requirements of FAR Construction Contract Clause 52.232-5 – Payments Under Fixed-Price Construction Contracts.

1.2 DEFINITIONS

A. Bid Item: Bid Items are listed on the Bid Schedule. Items include CSI MasterFormat™ reference.

B. Unit of Measure: Measurement units used to establish quantities. (U.S. Customary Measurement Units)

C. Method of Measurement: Defines extents, dimensional parameters or limitations, inclusions and exclusions for which costs related to the Item being measured shall be factored into the Unit Price for that Item.

D. Unit Price: Dollar value per identified Unit of Measurement for materials, labor, services and other items included in the Method of Measurement specific to an Item. The sum total of costs defined by the Method of Measurement is divided by the Unit of Measure for an Item to obtain the Unit Price for that Item.

E. Lump Sum as a Unit of Measure: Several types of materials that can be measured separately and when installed together as required by the Work, result in a separable component of the Work for which the extents can be defined by legal or physical parameters, Lump Sum may be used as the Unit of Measure. Lump Sum may also be used as the Unit of Measure for components of work which do not have physical dimensions. The Method of Measurement will identify parameters for costs that will be included in the Lump Sum Price.

F. Lump Sum as a Unit Price: When Lump Sum is the Unit of Measure; the price per unit is Lump Sum Price.

G. Quantity: The count or number of units of materials. Materials Quantity.

H. Amount: The unit price or total price expressed as dollar amount. Dollar Amount.

I. Unit Prices and Lump Sum Prices shall include necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit to provide the work shown on the drawings and described in the specifications for each Item identified.

J. Costs for items of work, which are not specifically mentioned to be included in a particular lump sum or unit price item, shall be included in the listed lump sum or unit price item most closely associated with that work.

K. Substantial Completion, Certificate of Occupancy and associated procedures are not applicable to this Work.

1.3 SUBSTITUTION PROCEDURES:

A. Product Substitution Procedures: This Contract does not specify products by Brand-Name except for the intent of establishing salient characteristics for any specified product. Provide the product submittals required within each individual specification section and according to Specification Section - “Submittal Procedures”.

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Partners Point Seawall 01 20 00 - 1
B. Execution Substitution Procedures: Unless specifically noted, this Contract does not dictate execution procedures or equipment; the Contractor shall provide products required, finished and operational as shown on the drawings and described in the specifications and according to Terms and Conditions of the Contract.

1.4 CONTRACT MODIFICATION PROCEDURES

A. REQUESTS FOR INTERPRETATION (RFI)

1. RFI: Request from Contractor seeking interpretation or clarification of the Contract Documents.

   a. RFI shall originate with Contractor. RFI submitted by entities other than Contractor will be returned with no response.
   b. Coordinate and submit RFI in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

3. Content: Include a detailed, legible description of item needing interpretation and the following:
   a. Project name.
   b. Date.
   c. Name of Contractor.
   d. Name of Contracting Officer and Construction Manager.
   e. RFI number, numbered sequentially.
   f. Specification Section number and title and related paragraphs, as appropriate.
   g. Drawing number and detail references, as appropriate.
   h. Field dimensions and conditions, as appropriate.
   i. Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
   j. Contractor's signature.
   k. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation.

4. RFI Submittal Formats: RFI may be submitted through email. Obtain Contracting Officer’s approval in advance. Otherwise, hard-copy RFI shall have the following format:
   a. Sheet Size: At least 8-1/2 by 11 inches but no larger than 11 by 17 inches.
   b. Number of Copies: Two (2) opaque copies for each RFI. CO will return one copy.
   c. Identify each page of attachments with the RFI number and sequential page number.

5. Contracting Officer's Action: Contracting Officer will review each RFI, determine action required, and return it. Allow 14 calendar days for Contracting Officer's response for each RFI. RFI received after 1:00 p.m. will be considered as received the following working day.
   a. The following RFIs will be returned without action:
      1) Requests for approval of submittals.
      2) Requests for approval of substitutions.
3) Requests for coordination information already indicated in the Contract Documents.
4) Requests for adjustments in the Contract Time or the Contract Sum.
5) Requests for interpretation of Contracting Officer's actions on submittals.
6) Incomplete RFIs or RFIs with numerous errors.

b. Contracting Officer's action may include a request for additional information, in which case
   Contracting Officer's time for response will start again.

6. On receipt of Contracting Officer's action, update the RFI log and immediately distribute the RFI
   response to affected parties. Review response and notify Contracting Officer within seven (7) calendar
   days if Contractor disagrees with response.

7. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit
   log weekly. Include the following:
   a. Project name.
   b. Name and address of Contractor.
   c. Name and address of Contracting Officer.
   d. RFI number including RFIs that were dropped and not submitted.
   e. RFI description.
   f. Date the RFI was submitted.
   g. Date Contracting Officer's response was received.
   h. Identification of related bilateral or unilateral modifications, extensions, and changes in scope,
      as appropriate.

B. CHANGE ORDERS
1. Contract Changes are stipulated in the Contract Terms and Conditions and require supplemental
   documentation which may include, but not be limited to any one, a combination of, or all of the
   following: product literature, product data, drawings, specifications, certifications, qualifications, test
   reports, description of existing situation, description of changes recommended, and detailed cost
   adjustment data indicating whether the Contract Total Price would be less or more than the current
   total Award Amount if the Change were approved. Refer to SECTION – “ADMINISTRATIVE
   PROCEDURES”, and Paragraph – “SUBMITTAL PROCEDURES”.

2. The Contractor shall notify the Contracting Officer immediately of any observed discrepancies.

3. Only the Government’s Contracting Officer Assigned for this Contract may approve Change Orders to
   this Contract; Change Orders require approval in writing by the Contracting Officer.

4. The Contractor will not be compensated for Work performed that is not included in the Scope of the
   Awarded Contract or otherwise approved in writing by the Contracting Officer.

C. ADDITIVE ITEMS
1. All payment items listed on the Contract Bid Schedule are Base Bid Items unless specifically
   identified otherwise. Additive Items are identified on the Contract Bid Schedule and described within
   this specification. Refer to Contract Terms and Conditions, and FAR Clauses incorporated by
   reference or included with full text. Only the Contracting Officer will approve Additive Items at the
   time of Contract Award or by signed Contract Modification during progress of the Work.
   a. Additive Item for Integral Color for Concrete, Structural, Class A
1) The Government reserves the right to execute the Additive Item identified in this Contract beginning with the Start Work Date through the date which the concrete is ordered and contingent upon available funds.

2) If ordered by the Contracting Officer, the Price established at the time of Contract Award for the Additive Item will be used to determine the extended Lump Sum Amount of a Contract Modification to the Base Bid Amount for purchasing and integrally mixing a government selected color into the Structural, Class A Concrete Mix quantities covered under the Base Bid Amount and for providing two (2) field-samples (16 sqft mock-ups) for government selection prior to ordering concrete.

D. OPTION ITEMS (NOT USED)

E. PRE-PRICED CONTINGENCY ITEMS

1. All payment items listed on the Contract Bid Schedule are Base Bid Items unless specifically identified otherwise. Pre-Priced Contingency Items are identified on the Contract Bid Schedule and described within this specification. Only the Contracting Officer will approve Pre-Priced Contingency Items at the time of Contract Award or by signed Contract Modification during progress of the Work.

a. Pre-Priced Contingency Items for Steel Sheetpile Installation

1) The Government reserves the right to utilize any one (1), or any combination of the pre-priced contingency units as required according to conditions at the time to factor the total lump sum price of a requested Contract Modification beginning with the date the first sheetpile is driven through date of receipt by the Government of the last test report for earthwork beneath the concrete deck slab depicting test results that meet or exceed requirements.

2) If ordered by the Contracting Officer, the Pricing established at the time of Contract Award for Pre-Priced Contingency Items will be used to determine the extended Lump Sum Amount of a Contract Modification to the Base Bid Amount according to the quantities approved for Contract Modification.

1.5 PROGRESS PAYMENT PROCEDURES

A. SCHEDULE OF VALUES

1. Coordination: Coordinate the Schedule of Values with Contractor's Construction Schedule Correlate line items in the Schedule of Values with other required administrative forms and schedules.

a. In lieu of the following Format and Content, the Bid Schedule Format that the Contractor submitted with the Cost Proposal in response to the Solicitation may continue to be used for this contract along with other required supplemental documentation that will support the Contractor’s progress payment requests.

b. Submit the Schedule of Values to Contracting Officer at earliest possible date but no later than seven (7) calendar days after the Notice to Proceed.

2. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.

a. Identification: Include the following Project identification on the Schedule of Values:

1) Project name and location.

2) Name of Contracting Officer.
3) Contractor's name and address.
4) Date of submittal.

b. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Provide line items for principal subcontract amounts, where appropriate.

c. Round amounts to nearest whole dollar; total shall equal the Contract Sum.

d. Materials installation shall be complete prior to Contractor submitting an Application for Payment. Coordinate updating the Schedule of Values on-site with Contracting Officer’s Representative prior to submitting Application for Payment.

e. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

f. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

1) Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.

g. Schedule Updating: Update and resubmit the Schedule of Values with each Application for Progress Payment and when Change Orders or Construction Change Directives result in a change in the Contract Sum.

B. PROGRESS PAYMENT PROCEDURES

1. Approval of Progress Payments: The Contractor shall coordinate their quality control requirements including monitoring of work and field measurements for installed work and document these efforts to supplement progress and final payment requests according to requirements stipulated in the Terms and Conditions of the Contract. Coordinate quantities installed by the Contractor with the COR prior to finalizing and submitting Application for Progress Payment.

2. Government reserves the right to reject Contractor's measurement of work-in-place and to have this work measured, at Government expense, by an independent surveyor acceptable to Contractor.

3. Field approval of installed work and subsequent approval of related progress payment requests does not imply Final Acceptance of the Work under the Contract. Final Acceptance for the entire Scope of Work under the Contract is determined by the Contracting Officer at Contract Completion regardless of Progress Payments.

4. Progress Payments made for each item listed shall constitute full compensation for furnishing all plant, labor, materials, and equipment, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit and for performing all work required and accepted for which separate payment is not otherwise provided.

5. Total payment for all progress payments and final payment shall not exceed the total dollar amount identified on the Contract Award unless approved in writing by the Contracting Officer.

6. Contractor’s Invoice document will indicate percent (%) contract completion, the total amount being applied for and a subtotal amount for each CSI MasterFormat™ Division related to the Work represented on the application. Contracting Officer will provide additional information at Award.
1.6 ITEMS LISTED ON THE BID SCHEDULE (PRICE BREAKDOWN)

A. ITEM - *MOBILIZATION*:
   1. Unit of Measure: Lump Sum.
   2. Method of Measurement: Measurement will include costs associated with mobilization and demobilization. Preparatory work and operations: movement of personnel and equipment that will be used for construction purposes on the project site. Does not include moves between project sites or vehicles or equipment that deliver construction materials, supplies and incidentals to the project site.

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B. ITEM - *CONTRACTOR’S PROJECT MANAGEMENT AND COORDINATION*:
   1. Unit of Measure: Lump Sum
   2. Method of Measurement: Measurement will include Contractor’s costs for administering/managing project and related documentation. Project manager, project superintendent, submittals clerk, generating, processing and tracking submittals, qualifications and resume submittals, payrolls, reports, payment requests, As-Built documents, sustainability/recycling and recycled content documentation, permits and plans documentation and processing, and closeout submittals, project records; maintaining and updating project schedules; coordinating project and trade craft meetings; maintaining and distributing meeting agendas and minutes; updated construction and other project schedules; and construction progress reporting. Does not include indirect Main Office or Overhead Expenses.

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<tr>
<th>ITEM NUMBER</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
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</thead>
<tbody>
<tr>
<td>01 31 00 (01)</td>
<td>CONTRACTOR’S PROJECT MANAGEMENT AND COORDINATION</td>
<td>LS</td>
</tr>
</tbody>
</table>

C. ITEM - *CONTRACTOR’S QUALITY CONTROL FOR EARTHWORK AND CONCRETE*:
   1. Unit of Measure: Lump Sum
   2. Method of Measurement: Measurement will include Contractor’s costs for field sampling and testing of materials, and quality control monitoring activities and documentation for earthwork and concrete.

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<thead>
<tr>
<th>ITEM NUMBER</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
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<tbody>
<tr>
<td>01 40 00 (01)</td>
<td>CONTRACTOR’S QUALITY CONTROL FOR EARTHWORK AND CONCRETE</td>
<td>LS</td>
</tr>
</tbody>
</table>

D. ITEM - *CONTRACTOR’S QUALITY CONTROL FOR SHEETPILE INSTALLATION*:
   1. Unit of Measure: Lump Sum
   2. Method of Measurement: Measurement will include Contractor’s costs for special inspection and monitoring during sheet pile installation: establishing driving parameters: force and frequency, quality control monitoring activities and documentation during installation of steel sheetpiles.

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<thead>
<tr>
<th>ITEM NUMBER</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
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</thead>
<tbody>
<tr>
<td>01 40 00 (02)</td>
<td>CONTRACTOR’S QUALITY CONTROL FOR SHEETPILE INSTALLATION</td>
<td>LS</td>
</tr>
</tbody>
</table>
E. ITEM - {TEMPORARY CONSTRUCTION UTILITIES}:
   1. Unit of Measure: Lump Sum
   2. Method of Measurement: Measurement will include costs for delivery, installing, using and removing the temporary equipment and devices necessary to provide power and water for construction purposes. Measurement includes fuel costs for generators. Measurement excludes fees for water for construction purposes. Measurement includes cellular phone calls for project.

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<tr>
<th>ITEM NUMBER</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>01 50 00 (01)</td>
<td>TEMPORARY UTILITIES</td>
<td>LS</td>
</tr>
</tbody>
</table>

F. ITEM - {TEMPORARY CONSTRUCTION FACILITIES}:
   1. Unit of Measure: Lump Sum
   2. Method of Measurement: Measurement will include costs for delivery, installing, using and removing the temporary office building and portable toilet necessary for the project operations.

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<thead>
<tr>
<th>ITEM NUMBER</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
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<tbody>
<tr>
<td>01 50 00 (02)</td>
<td>TEMPORARY OFFICE BUILDING</td>
<td>LS</td>
</tr>
<tr>
<td>01 50 00 (03)</td>
<td>TEMPORARY SANITARY FACILITY</td>
<td>LS</td>
</tr>
</tbody>
</table>

G. ITEM - {TEMPORARY FENCING}:
   1. Unit of Measure: Linear Feet
   2. Method of Measurement: Measurement will include costs for furnishing, installing, using, maintaining and removing temporary chain-link fencing. Measurement does not include chain-link fencing that will remain as a permanent part of the project; permanent chain-link fencing is measured elsewhere.

<table>
<thead>
<tr>
<th>ITEM NUMBER</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 50 00 (04)</td>
<td>TEMPORARY FENCING, CHAIN-LINK, 8 FEET HIGH</td>
<td>LS</td>
</tr>
</tbody>
</table>

H. ITEM - {TEMPORARY EROSION CONTROL}:
   1. Unit of Measure: Lump Sum
   2. Method of Measurement: Measurement will include costs for furnishing, installing, using, inspecting, maintaining, and removing the temporary erosion control measures including floating turbidity barrier.

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<tr>
<th>ITEM NUMBER</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
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<tbody>
<tr>
<td>01 57 13 (01)</td>
<td>TEMPORARY EROSION AND SEDIMENT CONTROL</td>
<td>LS</td>
</tr>
</tbody>
</table>

I. ITEM - {CONSTRUCTION SURVEYING AND CONSTRUCTION LAYOUT}:
   1. Unit of Measure: Lump Sum
   2. Method of Measurement: Measurement will include Contractor’s costs to provide personnel, equipment, and materials required to locate proposed improvements by stakeout on the existing site and maintain the marks and reference points in the proper place until no longer needed in accordance with SECTION 02 21 13 SITE SURVEY. Measurement includes bathymetric surveys for dredge...
quantities and subcontractors’ preparation of certified original and as-built surveys per SECTION - CONSTRUCTION PROGRESS DOCUMENTATION.

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<tr>
<th>ITEM NUMBER</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
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<tbody>
<tr>
<td>01 70 00 (01)</td>
<td>CONSTRUCTION SURVEYING AND CONSTRUCTION LAYOUT</td>
<td>LS</td>
</tr>
<tr>
<td>01 70 00 (02)</td>
<td>BATHYMETRIC SURVEY, PRE-DREDGE</td>
<td>LS</td>
</tr>
<tr>
<td>01 70 00 (03)</td>
<td>AS-BUILT SURVEY, INCLUDING POST-DREDGE BATHYMETRIC SURVEY</td>
<td>LS</td>
</tr>
</tbody>
</table>

J. ITEM - \{CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL\}:

1. Unit of Measure: Lump Sum
2. Method of Measurement: Measurement will include Contractor’s costs to provide temporary construction waste collection, storage, and materials segregation for disposal by landfill or recycling. Credit 50 percent compensation for any recycling credits provided to the Contractor for recycled materials generated by this project back to the Government.

<table>
<thead>
<tr>
<th>ITEM NUMBER</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
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<tbody>
<tr>
<td>01 70 00 (04)</td>
<td>CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL</td>
<td>LS</td>
</tr>
<tr>
<td>01 70 00 (05)</td>
<td>CONSTRUCTION RECYCLING CREDIT</td>
<td>LS</td>
</tr>
</tbody>
</table>

K. ITEM - \{SITE DEMOLITION\}:

1. Unit of Measure: Lump Sum
2. Method of Measurement: Measurement will include Contractor’s costs to demolish existing items necessary to complete the construction and as indicated. Measurement does not include clearing and grubbing; clearing and grubbing is measured elsewhere.

<table>
<thead>
<tr>
<th>ITEM NUMBER</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
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<tbody>
<tr>
<td>02 41 13 (01)</td>
<td>REMOVE EXISTING CHAIN-LINK FENCE</td>
<td>LF</td>
</tr>
<tr>
<td>02 41 13 (02)</td>
<td>REMOVE EXISTING RIVER ROCK</td>
<td>SF</td>
</tr>
<tr>
<td>02 41 13 (03)</td>
<td>REMOVE EXISTING BOAT DOCK, PILINGS AND ANCHORS</td>
<td>LS</td>
</tr>
</tbody>
</table>

L. ITEM - \{CONCRETE, STRUCTURAL\}:

1. Unit of Measure: Cubic Yard
2. Method of Measurement: Measurement will be according to the neat lines shown on the drawings for concrete anchors, concrete deck slab, concrete retaining walls and footings. Measurement includes forms, steel reinforcement, concrete, finishing, curing, waterproofing, drainage, integral color, and form removal. Concrete for fence and gate post footings is measured elsewhere.

<table>
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<tr>
<th>ITEM NUMBER</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
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<tbody>
<tr>
<td>03 31 00 (01)</td>
<td>CONCRETE, STRUCTURAL CLASS AA</td>
<td>CY</td>
</tr>
</tbody>
</table>
ITEM NUMBER | DESCRIPTION | UNIT
---|---|---
03 31 00 (02) | CONCRETE, STRUCTURAL CLASS A | CY
03 31 00 (03) | ADDITION OF INTEGRAL COLOR TO CONCRETE MIX STRUCTURAL, CLASS A INCLUDE TWO (2) MOCKUPS | LS

M. ITEM - \{MOORING CLEATS\}:

1. Unit of Measure: Each
2. Method of Measurement: Measurement will be made for each mooring cleat furnished and installed as noted on the drawings.

ITEM NUMBER | DESCRIPTION | UNIT
---|---|---
03 31 00 (04) | MOORING CLEATS, 10 INCH | EA

N. ITEM - \{DOCK BUMPERS\}:

1. Unit of Measure: Linear Feet
2. Method of Measurement: Measurement will be made along the centerline of the bumper for furnishing and installing dock bumpers as described in the specifications and shown on the drawings.

ITEM NUMBER | DESCRIPTION | UNIT
---|---|---
03 31 00 (05) | DOCK BUMPER, 4” WIDTH x 2” THICK | LF

O. ITEM - \{CLEARING AND GRUBBING\}:

1. Unit of Measure: Square Yard
2. Method of Measurement: Measurement shall include removal of site vegetation, construction debris, river rock slope cover and all other objectionable material from the work area. Measurement will include temporary stockpiling of salvaged riprap (river rock) and salvaged vegetation trimmings.

ITEM NUMBER | DESCRIPTION | UNIT
---|---|---
31 11 00 (01) | CLEARING AND GRUBBING | SY

P. ITEM - \{EXCAVATION\}:

1. Unit of Measure: Cubic Yard
2. Method of Measurement: removal to subgrade or to final grade of areas to receive fill or concrete, or other aggregate materials, rough grading, finish grading and disposal of excess excavated material.
   a. Measurement of excavation will be calculated based on surveyed cross sections. Cross sections shall be provided after clearing and grubbing and prior to any excavation or fill and final cross sections shall be provided at the same locations after excavation and fill is completed. Contractor shall provide hard copy plots of the cross sections. Cross section spacing shall be adequate to represent the volume of material removed. Contractor shall provide volumetric calculations using the Average end area method or other method approved by the CO.
   b. Quantity measurements for dredging excavation shall be made based on cross sections from completed and accepted pre-dredge and post-dredge underwater survey.
### Partner’s Point Seawall – Final BLM

**Division 1 – General Requirements**

**Section 01 20 00 – PRICE AND PAYMENT PROCEDURES**

<table>
<thead>
<tr>
<th>ITEM NUMBER</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
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<tbody>
<tr>
<td>31 23 00 (01)</td>
<td>EXCAVATION</td>
<td>CY</td>
</tr>
<tr>
<td>31 23 00 (02)</td>
<td>DREDGING</td>
<td>CY</td>
</tr>
</tbody>
</table>

**Q. ITEM – \{FILL AND BACKFILL\}:**

1. Unit of Measure: Cubic Yard
   a. Measurement of fill and backfill will be calculated based on surveyed cross sections. Cross sections shall be provided after clearing and grubbing and prior to any excavation or fill and final cross sections shall be provided at the same locations after excavation and fill is completed. Contractor shall provide hard copy plots of the cross sections. Cross section spacing shall be adequate to represent the volume of material removed. Contractor shall provide volumetric calculations using the Average end area method or other method approved by the Contracting Officer.

<table>
<thead>
<tr>
<th>ITEM NUMBER</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
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</thead>
<tbody>
<tr>
<td>31 23 00 (03)</td>
<td>STRUCTURAL FILL</td>
<td>CY</td>
</tr>
<tr>
<td>31 23 00 (04)</td>
<td>PERVIOUS BACKFILL</td>
<td>CY</td>
</tr>
</tbody>
</table>

**R. ITEM – \{AGGREGATE BASE COURSE\}**

1. Unit of Measure: Cubic Yard
2. Method of Measurement: Measurement will include furnishing, placing, grading, leveling and compaction of Aggregate Base Course (ABC) for road surface and sub base under concrete structures.

<table>
<thead>
<tr>
<th>ITEM NUMBER</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
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</thead>
<tbody>
<tr>
<td>31 23 00 (05)</td>
<td>AGGREGATE BASE COURSE</td>
<td>CY</td>
</tr>
</tbody>
</table>

**S. ITEM – \{CONTROLLED LOW STRENGTH MATERIAL\}**

1. Unit of Measure: Cubic Yard
2. Method of Measurement: Measurement will include furnishing, placing, and vibration of Controlled Low Strength Material (CLSM) used for fill and backfill.

<table>
<thead>
<tr>
<th>ITEM NUMBER</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
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</thead>
<tbody>
<tr>
<td>31 23 00 (06)</td>
<td>CONTROLLED LOW STRENGTH MATERIAL (CLSM)</td>
<td>CY</td>
</tr>
</tbody>
</table>

**T. ITEM – \{GRAVEL MULCH\}**

1. Unit of Measure: Square Yard
2. Method of Measurement: Measurement will include preparation of the subgrade, furnishing filter fabric and gravel, placing, grading and leveling and water settling of gravel mulch to the lines, dimensions and thicknesses shown on the drawings. No measurement will be made for water to settle gravel; costs to purchase water for construction purposes shall not be included in the Bid Price.
<table>
<thead>
<tr>
<th>ITEM NUMBER</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
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</thead>
<tbody>
<tr>
<td>31 23 00 (07)</td>
<td>GRAVEL MULCH (2 INCH THICK)</td>
<td>SY</td>
</tr>
</tbody>
</table>

U. ITEM – {RIPRAP}

1. Unit of Measure: Cubic Yard
2. Method of Measurement: Measurement will include preparation of the subgrade, furnishing filter fabric and salvaged river rock riprap, placing, grading and leveling riprap to the lines, dimensions and thicknesses shown on the drawings.

<table>
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<tr>
<th>ITEM NUMBER</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
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</thead>
<tbody>
<tr>
<td>31 23 00 (08)</td>
<td>RIPRAP</td>
<td>CY</td>
</tr>
</tbody>
</table>

V. ITEM - {STEEL ANCHOR (TIE-BACK) RODS}:

1. Unit of Measure: Each
2. Method of Measurement:
   a. Measurement will be made for each furnished and installed anchor rod, including turn buckles and all appurtenant structural steel including the steel channels, plates, nuts, bolts, washers, and all connections to the sheet piling. Includes all welding, emulsion coating and sand backfill. Includes hook and connection to hook from concrete anchors. Includes all adjustments necessary to tension the anchor rods.

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<tr>
<th>ITEM NUMBER</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
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<tbody>
<tr>
<td>31 51 00 (01)</td>
<td>STEEL ANCHOR (TIEBACK) RODS</td>
<td>EA</td>
</tr>
</tbody>
</table>

W. ITEM - {DRIVEN STEEL SHEETPILES}:

1. Unit of Measure: Vertical Linear Feet
2. Method of Measurement:
   a. Measurement will be the nominal linear feet of sheetpile across the top of the sheetpile and along the centerline of the seawall alignment for each different length of sheetpile indicated for furnished and installed sheet piling. Measurement includes furnishing, handling, storing and installing piling including placing, driving, cutting holes and other materials and work incident thereto. No separate measurement will be made for installation of required corner connectors. No separate measurement will be made for cutting or squaring the tops of the piles after completion of pile driving to the depths/elevations shown on the drawings.
   b. When pilings which have not been driven to penetration depths shown on the drawings are directed to be cut off by the Contracting Officer, measurement will be made for each cut off with sheetpile length greater than five (5) vertical linear feet.
   c. Measurement will be made for each piling spliced at the direction of the Contracting Officer to drive the piling to a depth greater than shown including furnishing the extension length of sheet pile up to the required top elevation.
   d. Measurement will be made for each linear foot of piling that is ordered to be removed by the Contracting Officer determined reusable and ordered to be reinstalled by the Contracting Officer.
c. Measurement will not be made for the following when resulting from improper or negligent Contractor construction handling or installation operations:

1) Sheetpile extension and splice to sheetpiles driven below the finished top elevation;
2) Sheetpile extension and splice to sheetpiles damaged by driving and cut off to permit further driving;
3) Removal and reinstallation of sheetpiles;
4) Removal, replacement, and installation of damaged sheetpiles which cannot reinstalled.

<table>
<thead>
<tr>
<th>ITEM NUMBER</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
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</thead>
<tbody>
<tr>
<td>31 62 00 (01)</td>
<td>STEEL SHEET PILES, 20' LONG PILES @ 27.56” WIDE NOMINAL LENGTH IN PLAN VIEW</td>
<td>LF</td>
</tr>
<tr>
<td>31 62 00 (02)</td>
<td>STEEL SHEET PILES, 15' LONG PILES @ 27.56” WIDE NOMINAL LENGTH IN PLAN VIEW</td>
<td>LF</td>
</tr>
<tr>
<td>31 62 00 (03)</td>
<td>STEEL SHEET PILES, 10' LONG PILES @ 27.56” WIDE NOMINAL LENGTH IN PLAN VIEW</td>
<td>LF</td>
</tr>
<tr>
<td>31 62 00 (04)</td>
<td>STEEL SHEET PILE CUT-OFF, ONE (1) FOOT LONG, 27.56” WIDE</td>
<td>LS</td>
</tr>
<tr>
<td>31 62 00 (05)</td>
<td>STEEL SHEET PILE EXTENSION, ONE (1) FOOT LONG, 27.56” WIDE, INCLUDING SPLICE</td>
<td>LS</td>
</tr>
<tr>
<td>31 62 00 (06)</td>
<td>STEEL SHEET PILE REMOVE AND REPLACE, 20' LONG PILE, 27.56” WIDE</td>
<td>LS</td>
</tr>
<tr>
<td>31 62 00 (07)</td>
<td>STEEL SHEET PILE REMOVE AND REPLACE, 15’ LONG PILE, 27.56” WIDE</td>
<td>LS</td>
</tr>
<tr>
<td>31 62 00 (08)</td>
<td>STEEL SHEET PILE REMOVE AND REPLACE, 10' LONG PILE, 27.56” WIDE</td>
<td>LS</td>
</tr>
<tr>
<td>31 62 00 (09)</td>
<td>STEEL SHEET PILE REMOVE AND REINSTALL UNDAMAGED PILE, 10’, 15’ OR 20’ LONG PILE, 27.56” WIDE</td>
<td>LS</td>
</tr>
</tbody>
</table>
X. ITEM - \{CHAIN-LINK FENCES AND GATES\}:

1. Unit of Measure: Linear Feet
2. Method of Measurement: Furnish and install 6 1/2 feet high chain-link fence with 3-strand barbed wire, and one (1) each 20 feet and 30 feet wide chain link single swing gates mounted on the concrete deck and one (1) each 20 feet wide chain link swing gate at the entrance to the ramp. Measurement includes providing all materials and accessories, installed and functioning as shown on the drawings and described in the specifications. No separate measurement will be made for concrete and grout for post holes and anchors, base plates and anchors for mounting on the concrete deck or attachment to the retaining walls, sleeve inserts in the deck, cane bolts, appurtenant hardware, and chain link fence posts installed on top of the retaining walls or for gates anchored to the concrete slab.

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<th>ITEM NUMBER</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
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<tbody>
<tr>
<td>32 31 00 (01)</td>
<td>6 1/2 FEET HIGH CHAIN-LINK FENCE</td>
<td>LF</td>
</tr>
<tr>
<td></td>
<td>3 STRAND BARBED WIRE W/SUPPORTS</td>
<td></td>
</tr>
<tr>
<td>32 31 00 (02)</td>
<td>6 1/2 FEET HIGH CHAIN-LINK</td>
<td>EA</td>
</tr>
<tr>
<td></td>
<td>3 STRAND BARBED WIRE W/SUPPORTS</td>
<td></td>
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<tr>
<td></td>
<td>20’ SWING GATE (AT DOCK)</td>
<td></td>
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<tr>
<td>32 31 00 (03)</td>
<td>6 1/2 FEET HIGH CHAIN-LINK</td>
<td>EA</td>
</tr>
<tr>
<td></td>
<td>3 STRAND BARBED WIRE W/SUPPORTS</td>
<td></td>
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<tr>
<td></td>
<td>30’ SWING GATE (AT DOCK)</td>
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<tr>
<td>32 31 00 (04)</td>
<td>6 1/2 FEET HIGH CHAIN-LINK</td>
<td>EA</td>
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<tr>
<td></td>
<td>3 STRAND BARBED WIRE W/SUPPORTS</td>
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<tr>
<td></td>
<td>20’ SWING GATE (AT RAMP)</td>
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</tbody>
</table>

Y. ITEM - \{SITE IMPROVEMENTS GROUNDING\}:

1. Unit of Measure: Lump Sum
2. Method of Measurement: Measurement will be made for furnishing and installing grounding for the new (permanent) fencing. Furnish and install grounding conductors, bars, plates, rods, clamps and welded connections as shown on the drawings and described in the specifications.

<table>
<thead>
<tr>
<th>ITEM NUMBER</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>33 79 00 (01)</td>
<td>SITE IMPROVEMENTS GROUNDING</td>
<td>LS</td>
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</tbody>
</table>

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 20 00
SECTION 01 30 00 - ADMINISTRATIVE REQUIREMENTS

SECTION 01 31 00 – PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for coordinating construction operations including, but not limited to:
   1. Project Coordination.
   2. Project meetings.

1.2 PROJECT COORDINATION

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.
   1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
   2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
   3. Make adequate provisions to accommodate items scheduled for later installation.
   4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
   1. Prepare similar memoranda for Contracting Officer and separate contractors if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
   1. Preparation of Contractor's Construction Schedule.
   2. Preparation of the Schedule of Values.
   3. Installation and removal of temporary facilities and controls.
   4. Delivery and processing of submittals.
   5. Progress meetings.
   6. Pre-installation conferences.
   7. Project closeout activities.
   8. Project closeout activities.
D. Coordination Between Documentation and Field Work

1. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

2. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.
   a. Secure time commitments for performing critical elements of the Work from parties involved.

1.3 SECTION 013119 - PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Contracting Officer of scheduled meeting dates and times.

2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.

3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Contracting Officer, within three (3) business days of the meeting.

B. Preconstruction Conference: Schedule a preconstruction conference before starting construction, at a time convenient to Contracting Officer and Architect, but no later than 10 days after Contract Award. Hold the conference at Project site or another convenient location approved by the Contracting Officer. Conduct the meeting to review responsibilities and personnel assignments, review required work, project drawings, specifications, construction schedules, payroll, payments, and administrative provisions of the Contract. Be prepared to summarize and explain procedures planned for the project and present specified preconstruction submittals.

1. Attendees: Authorized representatives of Government, Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work. Electrical subcontractors attendance is required.

2. Agenda: Discuss items of significance that could affect progress, including the following:
   a. Construction schedule approved by Contracting Officer.
   b. Phasing.
   c. Critical work sequencing and long-lead items.
   d. Designation of key personnel and their duties.
   e. Procedures for processing field decisions and Change Orders.
   f. Procedures for RFI's.
   g. Procedures for testing and inspecting.
   h. Procedures for processing Applications for Payment.
   i. Distribution of the Contract Documents.
   j. Submittal procedures.
   k. Sustainability requirements.
   l. Preparation of Record Documents.
m. Use of the premises and existing building(s).

n. Work restrictions.

o. Government occupancy requirements.

p. Responsibilities for temporary facilities and controls.

q. Permits and stipulations.

r. Construction waste management and recycling.

s. Parking availability.

t. Office, work, and storage areas.

u. Equipment deliveries and priorities.

v. First aid, Accident Prevention, Safety and Health Plans

w. Security.

x. Progress cleaning.

y. Working hours.

3. Minutes: Contractor shall record and distribute meeting minutes.

C. Pre-installation Conferences: Conduct a pre-installation conference at Project site before each construction activity that requires coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Contracting Officer of scheduled meeting dates.

2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including any requirements for the following:


b. Options.

c. Related RFI's.

d. Related Change Orders.

e. Purchases.

f. Deliveries.

g. Submittals.

h. Review of mockups.

i. Possible conflicts.

j. Compatibility problems.

k. Time schedules.

l. Weather limitations.

m. Manufacturer's written recommendations.
n. Warranty requirements.
o. Compatibility of materials.
p. Acceptability of substrates.
q. Temporary facilities and controls.
r. Space and access limitations.
s. Regulations of authorities having jurisdiction.
t. Testing and inspecting requirements.
u. Installation procedures.
v. Coordination with other work.
w. Required performance results.
x. Protection of adjacent work.
y. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.

4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.

5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Progress Meetings: Conduct progress meetings at weekly intervals. Hold the meetings at the project site. Coordinate dates of meetings with preparation of payment requests. Additional progress meetings may be requested by either the Contracting Officer or Contractor.

1. Attendees: In addition to representatives of Government, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

1) Review schedule for next period.

b. Review present and future needs of each entity present, including the following:

1) Interface requirements.

2) Sequence of operations.
3) Status of submittals.
4) Deliveries.
5) Off-site fabrication.
6) Access.
7) Site utilization.
8) Temporary facilities and controls.
9) Work hours.
10) Hazards and risks.
11) Progress cleaning.
12) Quality and work standards.
13) Status of correction of deficient items.
14) Field observations.
15) RFI s.
16) Status of proposal requests.
17) Pending changes.
18) Status of Change Orders.
19) Pending claims and disputes.
20) Documentation of information for payment requests.

3. Minutes: The Contractor shall record and distribute the meeting minutes.
4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.
   a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

1.4 ELECTRONIC COMMUNICATION PROTOCOLS

A. General: The primary means of project communication between the Contracting Officer and the Contractor will be through email and by telephone.

B. The Contracting Officer will establish project-specific electronic communications protocols during the Pre-Construction Conference. The following will be established for minimum requirements:
   1. All submittal documents are permitted to be initially transmitted by email as attachments provided the information and format described in the specifications as required for the documents being submitted are included with the transmittal and the attachments and the file size does not exceed either party's system capacity.
   2. The Contractor's and Government's capability/software versions compatibility for electronic document transmittals will factor into establishing the electronic communication protocols.
3. Identify which submittal documents transmitted as electronic attachments are required to be also submitted as hard-copy originals to the Contracting Officer. Note this on Submittal Log.

4. Identify which submittal documents transmitted as electronic attachments to an email are required to also be submitted as electronic files on a project-specific, permanently-labeled compact disk, flash drive, or other stand-alone media storage device.

5. Identify which contract documents logs, meeting notes, photographic documentation, operations and maintenance manuals, training instructions, and other record documents transmitted as electronic attachments to an email are required to also be submitted hard-copy and/or as electronic files on a project-specific, permanently-labeled media storage device.

C. Pay Requests: Electronic communication protocols for submitting Pay Requests are described in the Terms and Conditions of the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 31 00
PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Scheduling of Work.
2. Contractor's Construction Progress Schedule.
5. Survey and Layout Data.
7. Periodic Work Observation.
8. Photographic Documentation.

1.2 SUBMITTALS

A. Submittals Schedule: See preliminary submittals schedule spreadsheet (*.xlsx, MS 2007) included with solicitation.

B. Preliminary Network Diagram: When hard copies are required, submit two (2) opaque copies, large enough to show entire network for entire construction period. Show logic ties for activities.

C. Contractor's Construction Progress Schedule: When hard copies are required, submit two (2) opaque copies of initial schedule, large enough to show entire schedule for entire contract period.

1. Submit an electronic copy of schedule, using software indicated, on CD-R, and labeled to comply with requirements for submittals. Include type of schedule (Initial or Updated) and date on label.

2. When Contractor’s Construction Progress Schedules is in CPM Format, provide CPM Reports: Concurrent with CPM schedule, submit each of the following computer generated reports. When hard copies are required by the Contracting Officer, submit three (3) opaque copies of each of the following computer-generated reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.

   a. Activity Report: List of activities sorted by activity number and early start date, or actual start date if known.

   b. Logic Report: List of preceding and succeeding activities for each activity, sorted in ascending order by activity number and early start date, or actual start date if known.

   c. Total Float Report: List of all activities sorted in ascending order of total float.
D. Daily Construction Reports: When hard copies are required by the Contracting Officer, submit two (2) opaque copies at weekly intervals. Note field observations for completed and pending Work.

E. Field Condition Reports: When hard copies are required by the Contracting Officer, submit two (2) opaque copies at time of discovery of differing conditions. Note field observations for completed and pending Work.

F. Construction Photographs Key Plan: Submit key plan of Project site with notation of vantage points marked for location and direction of each photograph. Indicate elevation of construction. Include same label information as corresponding set of photographs.

G. Construction Photographs: Submit MS Word electronic file via email within 7 [seven] calendar days of taking photographs.
   1. Format: Insert digital photos into MS Word file with two 4-by-6-inch prints per page and titles beneath each photo.
   2. Identification: On first page of MS Word file, provide the following information:
      a. Name of Project.
      b. Name of Contractor.
      c. Date photograph was taken if not date stamped by camera.
   3. Digital Images: Submit a complete set of digital image electronic files on CD-ROM. Identify electronic media with date photographs were taken. Submit images that have same aspect ratio as the sensor, uncropped.

1.3 SCHEDULING OF WORK

A. Scheduling: Schedule construction operations to ensure efficient and orderly installation of each part of the Work. Schedule construction operations to support timely and sequential installation of the different Specification Sections that depend on each other for proper installation, connection, and operation.
   1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.
   2. Schedule installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
   3. Make adequate provisions to accommodate items scheduled for later installation.
   4. Where availability of space is limited, schedule installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of each component, including mechanical and electrical.

1.4 CONTRACTOR’S CONSTRUCTION PROGRESS SCHEDULE

A. DEFINITIONS
   1. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
Partner’s Point Seawall – Final BLM
Division 1 – General Requirements

Section 01 30 00 - Administrative Requirements
Section 01 32 00 - Construction Progress Documentation

Stantec Consulting Services Inc.
Partners Point Seawall – L14PD01347 01 32 00 - 3

1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.

2. Predecessor Activity: An activity that precedes another activity in the network.

3. Successor Activity: An activity that follows another activity in the network.

2. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

3. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

4. Float: The measure of leeway in starting and completing an activity.

5. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.

6. Major Area: A story of construction, a separate building, or a similar significant construction element.

B. CONTRACTOR'S CONSTRUCTION PROGRESS SCHEDULE, GENERAL

1. Time Frame: Extend schedule from date established for the Start Work Date on the Notice to Proceed Letter to date of Final Completion.

a. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized in writing by the Contracting Officer.

2. Activities: Treat each separate area as a separate numbered activity for each principal element of the Work. Comply with the following:

a. Activity Duration: Define activities so no activity is longer than five (5) business days, unless specifically allowed by Contracting Officer.

b. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 7 calendar days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.

1) Steel sheet piles
2) Tie-back rods
3) Fence and gates
4) Steel reinforcement

c. Submittal Review Time: Include review and resubmittal times indicated in Division 1 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.

d. Startup and Testing Time: Not applicable for this project.

e. Substantial Completion: Not applicable for this project. Project will be subject to Final Inspection and Final Acceptance by the Contracting Officer.

3. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

a. Work by Government: No work will be performed by the Government for this Contract.
b. Work Restrictions: When required by the Work, show the effect of the following items on the schedule:

1) Coordination with existing construction.
2) Uninterruptible services.
3) Use of Site restrictions.
4) Seasonal variations.
5) Environmental control.

c. Work Stages: Indicate important stages of construction for each major portion of the Work.

4. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Start Work Date from the Notice to Proceed and Final Inspection, and the following interim milestones:

a. Begin/end development of site required plans:

1) Construction Safety / Accident Prevention;
2) Health, Safety and Emergency Response;
3) Storm Water Pollution Prevention;
4) Spill Prevention Control and Countermeasure;
5) Noise Control;
6) Traffic Control Plan, if required for transport of materials to project site on public roads.

b. Begin/end permit applications and/or review procedures

1) Storm Water Pollution Prevention;
2) Spill Prevention Control and Countermeasure.

c. Begin/end installation of temporary controls and facilities

d. Begin/end for clearing, grubbing, excavations, backfills, compaction

e. Begin/end removal and disposal of existing improvements

f. Begin/end Sheetpile installation

g. Begin/end for concrete forming and rebar, curing, and backfill

h. Begin/end lightning protection/grounding installation

i. Begin/end fence and gate installation

j. Begin/end government inspections for components of work listed above and including below grade and other work which will not be visible in the finished construction.

C. CONTRACTOR'S CONSTRUCTION PROGRESS SCHEDULE (GANTT CHART)

1. The Contractor’s Construction Contract Schedule may be submitted as a Gantt chart provided milestones and activities required herein can be clearly presented in this format.

2. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal Gantt-chart-type, Contractor's Construction Schedule at the Pre-Construction Conference. Base schedule on the Preliminary Construction Schedule and whatever updating and feedback was received since the start of Project.
3. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.
   a. For construction activities that require three (3) months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

D. CONTRACTOR'S CONSTRUCTION PROGRESS SCHEDULE (CPM SCHEDULE)

1. The Contractor’s Construction Contract Schedule may be submitted as a Critical Path Method Schedule provided milestones and activities required herein can be clearly presented in this format.

2. General: Prepare network diagrams using AON (activity-on-node) format.

3. Preliminary Network Diagram: Submit diagram at the Pre-Construction Conference. Outline significant construction activities for the first 60 days of construction. Include skeleton diagram for the remainder of the Work and progress payment request predictions based on indicated activities.

   a. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than seven (21) calendar days after date established for the Notice to Proceed.
      1) Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Contracting Officer's approval of the schedule.
   b. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
   c. Use "one workday" as the unit of time. Include list of nonworking days and holidays incorporated into the schedule.

5. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths.
   a. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
      1) Preparation and processing of submittals.
      2) Mobilization and demobilization.
      3) Purchase of materials.
      4) Delivery.
      5) Fabrication.
      6) Utility interruptions.
      7) Installation.
      8) Testing.
      9) Inspections.
   b. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
c. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.

d. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.

1) Subnetworks on separate sheets are permissible for activities clearly off the critical path.

6. Initial Issue of Schedule: Prepare initial network diagram from a list of straight "early start-total float" sort. Identify critical activities. Prepare tabulated reports showing the following:

a. Contractor or subcontractor and the Work or activity.
b. Description of activity.
c. Principal events of activity.
d. Immediate preceding and succeeding activities.
e. Early and late start dates.
f. Early and late finish dates.
g. Activity duration in workdays.
h. Total float or slack time.
i. Average size of workforce.

7. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:

a. Identification of activities that have changed.
b. Changes in early and late start dates.
c. Changes in early and late finish dates.
d. Changes in activity durations in workdays.
e. Changes in the critical path.
f. Changes in total float or slack time.
g. Changes in the Contract Time.

1.5 SUBMITTALS SCHEDULE

A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.

1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.

2. Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

3. Arrange the following information in a tabular format:

a. Scheduled date for first submittal.
b. Specification Section number and title.
c. Submittal category (action or informational).
d. Name of subcontractor.
e. Description of the Work covered.
f. CPM activity or event number.
g. Scheduled date for purchasing materials.
h. Scheduled date for installation of materials.
i. Scheduled date for Contracting Officer's final release or approval.

B. Submittals Schedule: See preliminary submittals schedule spreadsheet (*.xlsx, MS 2007) included with posted solicitation.

1.6 SURVEY AND LAYOUT DATA

A. Definitions:
   1. Certificates: Submit certificate signed by registered land surveyor or professional engineer certifying that location and elevation of improvements comply with requirements.
   2. Certified Original Surveys: Submit two copies signed by land surveyor or professional engineer showing existing conditions.
   3. As-Built Survey: Submit 2 copies showing the Work performed and record survey data.

1.7 CONSTRUCTION PROGRESS REPORTING

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
   1. List of subcontractors at Project site.
   2. Equipment at Project site.
   3. Material deliveries.
   4. High and low temperatures and weather conditions.
   5. Accidents.
   7. Meter readings and similar recordings.
   8. Orders and requests of authorities having jurisdiction.
   9. Services connected and disconnected.

B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a request for interpretation. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

C. Contractor's Construction Progress Schedule Updating: At weekly intervals, update schedule to reflect actual construction progress and activities. Distribute updated schedule at each regularly scheduled progress meeting.
1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.

2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.

3. As the Work progresses, indicate Actual Completion percentage for each activity.

D. Distribution: Distribute copies of approved schedule to Contracting Officer, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.

2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

1.8 PERIODIC WORK OBSERVATION

A. Periodic Work Observations: The Contractor or the individual identified by letter to the Contracting Officer as the Contractor’s Authorized Representative shall perform weekly site visits for observation and shall verify whether or not work is progressing according to the approved construction progress schedule.

1.9 PHOTOGRAPHIC DOCUMENTATION

A. Photographic Media

1. Digital Images: Provide images in uncompressed JPG format, produced by a digital camera with minimum sensor size of 4.0 megapixels, and at an image resolution of not less than 1600 by 1200 pixels.

B. Construction Photographs

1. Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.

   a. Maintain key plan with each set of construction photographs that identifies each photographic location.

2. Film Images:

   a. Date Stamp: Unless otherwise indicated, date and time stamp each photograph as it is being taken so stamp is integral to photograph.

   b. Field Office Prints: Retain one set of prints of progress photographs in the field office at Project site, available at all times for reference. Identify photographs same as for those submitted to Contracting Officer.

3. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.

   a. Date and Time: Include date and time in filename for each image.

   b. Field Office Images: Maintain one set of images on CD-ROM in the field office at Project site, available at all times for reference. Identify images same as for those submitted to Contracting Officer.
4. **Preconstruction Photographs:** Before starting construction, take color, digital photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Contracting Officer.
   a. Flag excavation areas and construction limits before taking construction photographs.
   b. Take eight (8) photographs to show existing conditions adjacent to property before starting the Work.
   c. Take eight (8) photographs of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.

5. **Periodic Construction Photographs:** Take 12 color, digital photographs weekly, with timing each month adjusted to coincide with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.

6. **Additional Photographs:** Contracting Officer may issue requests for additional photographs, in addition to periodic photographs specified. Additional photographs will be paid for by Change Order and are not included in the Contract Sum.
   a. Three days' notice will be given, where feasible.
   b. In emergency situations, take additional photographs within 24 hours of request.
   c. Circumstances that could require additional photographs include, but are not limited to, the following:
      1) Prior to Special events planned at Project site.
      2) Immediate follow-up when on-site events result in construction damage or losses.
      3) Photographs to be taken at fabrication locations away from Project site. These photographs are not subject to unit prices or unit-cost allowances.
      4) Extra record photographs at time of final acceptance.
      5) Government request for special publicity photographs.

1.10 **PURCHASE ORDER TRACKING**

   A. **General:** Document, track, log and submit invoices and receipts not otherwise indicated for submission that would be necessary to support the Contractor’s payment application(s) available upon request of the CO.
SECTION 01 30 00 – ADMINISTRATIVE REQUIREMENTS

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for the Contractor’s contract required submissions to the Contracting Officer.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information that requires Contracting Officer's responsive action.

B. Informational Submittals: Written information that does not require Contracting Officer's responsive action. Submittals may be rejected for not complying with requirements.

1.3 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.

2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

   a. Contracting Officer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

3. Begin preparing and processing submittal documents on the Start Work Date indicated on the Notice to Proceed and submit for approval or acceptance at the earliest time possible within the Contract Schedule.

B. Submittals Schedule: Refer to Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.

C. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Contracting Officer's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow 14 calendar days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Contracting Officer will advise Contractor when a submittal being processed must be delayed for coordination.

2. Intermediate Review: If intermediate submittal is necessary, the process time is the same duration as and is sequential to the initial submittal.

3. Resubmittal Review: Allow 7 calendar days for review of each resubmittal.
D. Electronic Procedures:

1. The Contractor shall transmit the submission or group of submissions by eMail directly to the Contracting Officer with “cc to the Contracting Officer’s Representative with the files attached. Each eMail transmittal initiated by the Contractor or Contracting Officer containing submittals shall include a copy of the most current Submittals Schedule.

2. The subject line of the eMail shall use this nomenclature:
   a. \( \text{Contract Number} \{ \text{Contract Name} \} \text{ eMail Transmittal of Submittals \# \{mm/dd/yyyy\} } \),
      where \# begins at 1 with the first eMail transmittal of a submittal(s) and is numbered consecutively for each eMail that transmits a submittal. Track submittal eMails on the Submittal Schedule.

3. The submittals contained in the eMail shall be indicated so on the Submittals Schedule.

4. Transmittals by eMail that contain submittals shall only contain submittals and nothing else.

5. Electronic file names shall correspond with identification information required below.

6. Electronic files shall be separated by each type of material, product, or equipment that has a differing specification indicated in the Contract documents. Electronic files shall be separated by Specification Section Number and shall be further separated based on the category of submittal identified herein.

7. Where signatures, stamps, notarized original documents are required of the submittal; scan the original for eMail transmittal and mail the original to the Contracting Officer certified with tracking.

E. Identification: Place a permanent label or title block on each submittal for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.

2. Provide a space approximately 6 inches by 8 inches on label or beside title block to record Contractor’s review and approval markings and action taken by Contracting Officer.

3. Include the following information on label for processing and recording action taken:
   a. Project name.
   b. Date.
   c. Name and address of Engineer.
   d. Name and address of Architect.
   e. Name and address of Contractor.
   f. Name and address of subcontractor.
   g. Name and address of supplier.
   h. Name of manufacturer.
   i. Submittal number or other unique identifier, including revision identifier.
      1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 06100.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 06100.01.A). Work schedule and value schedules shall be numbers 01000.01 and 01000.02.
   j. Number and title of appropriate Specification Section.
   k. Drawing number and detail references, as appropriate.
l. Location(s) where product is to be installed, as appropriate.
m. Other necessary identification.

F. Cover Sheet: Use Cover Sheet

1. Ensure that cover sheet includes following information:
   a. Submittal Number
   b. Contract Number
   c. Specification section number and title, paragraph, and complete description of item being submitted. Be specific and clearly identify what is being submitted. When appropriate, reference a specific sheet and detail of the Drawings. Note multiple items individually.
   d. Signature and date.
   e. Name and telephone number of individual to contact for further information, if other than Contractor.

2. Submitted Information: Link submittal to cover sheet by contract number, project name, and submittal number. Stamp is recommended, but may be hand-written on each copy; ensure submittal stamp includes project name and contract number and blank space in which to write submittal number. Stamp or write this information on all copies.

G. Deviations: Highlight, encircle, or otherwise specifically identify deviations from the Contract Documents on submittals.

H. Additional Copies: Unless additional copies are required for final submittal, and unless Contracting Officer observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.

I. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Contracting Officer will return submittals, without review received from sources other than Contractor.

1. Transmittal/Submittals Schedule Form: Use form as directed by Contracting Officer.

J. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.
3. Resubmit submittals until they are marked Approved.

K. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, and installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

L. Use for Construction: Use only final submittals with mark indicating Approved by Contracting Officer.
1.4 CONTRACTOR'S USE OF DESIGNER’S CAD FILES AND SPECIFICATION FILES

A. At Contractor's written request, electronic copies of Designer’s CAD files will be provided to Contractor for Contractor's use in connection with Project, subject to the following limits:

1. These may only be edited to depict the As-Built conditions when construction materials and methods are altered from the original Contract Work.

2. The Contractor shall identify and submit the electronic format for line types, text types, legends, key symbols and other notations that will be used for incorporating As-Built information for review and acceptance in advance of receiving the electronic files; these must be in alignment with and separable from the existing legends, line types, and key symbols.

3. Editing of electronic drawing files shall be performed by individuals who were regularly engaged in editing the type of file formats provided at least 12 months prior to Contract Award and who will remain regularly engaged in editing electronic drawing files throughout the Contract Period of Performance as a core part of their daily assignments.

4. The term As-Built shall be added at the front of each file name once edits are completed and the electronic As-Built document is saved.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

A. Prepare and submit Action Submittals required by individual Specification Sections.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.

2. Mark each copy of each submittal to show which products and options are applicable.

3. Include the following information, as applicable:
   a. Manufacturer's written recommendations.
   b. Manufacturer's product specifications.
   c. Manufacturer's installation instructions.
   d. Manufacturer's catalog cuts.
   e. Compliance with specified referenced standards.
   f. Testing by recognized testing agency.

4. Number of Copies: Transmit one (1) copy of Product Data, unless otherwise indicated. Mark up and retain one returned copy as a Project Record Document.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal of Designer’s CAD Drawings is otherwise permitted.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following as applicable:
   a. Dimensions.
   b. Identification of products.
   c. Fabrication and installation drawings.
   d. Roughing-in and setting diagrams.
   e. Shopwork manufacturing instructions.
   f. Templates and patterns.
   g. Schedules.
   h. Notation of coordination requirements.
   i. Notation of dimensions established by field measurement.
   j. Relationship to adjoining construction clearly indicated.
   k. Seal and signature of professional engineer if required or specified.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 22 by 34 inches.

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.

2. Identification: Attach label on unexposed side of Samples that includes the following:
   a. Generic description of Sample.
   b. Product name and name of manufacturer.
   c. Sample source.
   d. Lot.
   e. Style.
   f. Color.
   g. Locations of use.
   h. Number and title of appropriate Specification Section.

3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available. Color selections will be made only after all related color samples have been received.
a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Contracting Officer will return submittal with options selected.

5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

a. Number of Samples: Submit three (3) sets of Samples. Contracting Officer will retain two (2) Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a Project Record Sample.

E. Product Schedule or List: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location.

1. Number of Copies: Submit one (1) copies of product schedule or list by eMail transmittal, unless otherwise indicated.

F. Submittals Schedule: Comply with requirements specified in Division 1 Section "Construction Progress Documentation."

G. Schedule of Values: Comply with requirements specified in Section "Price and Payment Procedures."

H. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design.

1. Number of Copies: Submit one (1) copies of subcontractor list, unless otherwise indicated.

2.2 INFORMATIONAL SUBMITTALS

A. Prepare and submit Informational Submittals required by other Specification Sections.

1. Number of Copies: Submit one (1) electronic copies of each submittal, unless otherwise indicated.

2. Certificates and Certifications: Provide notarized statement that includes signature of entity responsible for preparing certification, signed by officer or other individual authorized to sign documents on behalf of that entity. State that the named product conforms to the Contract requirements. Submit certificate with a certified copy of test results, or certify that such test results are on file with the manufacturer and will be furnished to Contracting Officer upon request. Provide name and address of manufacturer, testing agency, and date of tests. The certificate shall set forth the means of identification which will permit field determination of the product delivered as being the product covered by the certification.

3. Test and Inspection Reports: Refer to Section "Quality Requirements."

B. Coordination Drawings: Refer to Section "Project Management and Coordination."

C. Contractor's Construction Schedule: Refer to Section "Construction Progress Documentation."
D. Conformance Certificates: Prepare written certification that material complies with Contract Documents. Include evidence prior to sampling and testing.

E. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.

F. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

G. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

H. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

I. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

J. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract.

K. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

L. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.

M. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

N. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

O. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

P. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements specified in Division 1 Section "Operation and Maintenance Data."

Q. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other
performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

R. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer.

S. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:

2. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.

T. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

U. Construction Photographs: Refer to Section – “Construction Progress Documentation”.

2.3 DELEGATED DESIGN

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Contracting Officer.

B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit one (1) copies of a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Review each submittal and check for coordination with other Work and for compliance with Contract. Note corrections and field dimensions. Mark with Contractor’s approval stamp before submitting to CO.

B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with Contract Documents.
3.2 CONTRACTING OFFICER'S ACTION

A. General: Contracting Officer will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Contracting Officer will review each submittal, make marks to indicate corrections or modifications required, and return it. Contracting Officer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:

   A  FURNISH AS SUBMITTED.
   B  FURNISH AS NOTED (BY ENGINEER).
   C  REVISE AND RESUBMIT.
   D  REJECTED.
   E  ENGINEER'S REVIEW NOT REQUIRED.

   i. Contracting Officer will eMail response to Contractor.

C. Informational Submittals: Contracting Officer will review each submittal and will not return it, or will return it if it does not comply with requirements.

D. Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.

E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

F. Written approval of submittals is indication that Contractor's submittals have been reviewed and there are no objections, except as noted.

G. Installation of material on basis of written approval of submittals shall not relieve Contractor of responsibility for incorporating material that conforms to requirements of Contract Documents.

H. Written approval of deviations shall apply only to those deviations or omissions from the requirements of Contract Documents brought to Contracting Officer's attention in writing.

I. After written approval of an item, Contractor may submit substitution for approval, if approved item cannot be purchased or delivered in time to avoid delay in completion of the project.

J. Measurements: Where approved manufacturer's diagrams and shop drawings give specific measurements or rough-in dimensions for equipment, these dimensions shall take precedence over dimensions indicated on Drawings.

END OF SECTION 01 33 00
PART 1 - GENERAL

1.1 SPECIAL PROJECT PROCEDURES

A. GENERAL

1. The Contractor shall remove any employee the Government’s Contracting Officer deems incompetent, careless or otherwise objectionable.

1.2 BLM AZ CONSTRUCTION SAFETY REQUIREMENTS

A. SAFETY AWARENESS AS THE FIRST PRIORITY FOR DAILY BUSINESS AT THE PROJECT

1. The Contractor shall ensure that each person entering the project site is familiar with the contents of the Construction Safety / Accident Prevention and the Health, Safety, and Emergency Response plans and a legible copy of these documents shall be maintained in a location known to and readily available to all personnel, inspectors and project visitors.

2. The Contractor shall conduct and document on-site safety meetings routinely; daily and/or weekly as required by the variation in tasks during progression of the Work. The safety meetings shall occur prior to beginning the work tasks.

B. CONTRACTOR’S GOALS FOR ZERO ACCIDENTS

1. Contractor’s company owners and leaders shall convey their goals for zero accidents to their employees by routinely encouraging their employees to participate with safety procedures and requesting their employees recommend solutions back to the company of observed safety issues.

1.3 GOVERNMENTAL SAFETY REQUIREMENTS

A. CONSTRUCTION SAFETY / ACCIDENT PREVENTION PLAN

1. The Contractor shall submit a Construction Safety/Accident Prevention Plan at the Pre-Construction Conference.


1.4 HEALTH, SAFETY AND EMERGENCY RESPONSE PROCEDURES

A. HEALTH, SAFETY AND EMERGENCY RESPONSE PLAN

1. BLM often has construction projects in remote areas where air response may be more efficient than ambulance and/or projects may be located in areas not covered by an established 911 system.
2. The Contractor shall learn emergency response protocols, agencies or entities that would be first responders for emergency services, and obtain accurate emergency response contact information specific to the project site.

3. The Contractor shall submit a separate Health, Safety, and Emergency Response Plan at the Pre-Construction Conference, or may incorporate the health, safety and emergency response protocols and contact information as a separate, easily identifiable section within the Construction Safety/Accident Prevention Plan.

4. The Health, Safety, and Emergency Response Plan shall incorporate the emergency response protocols and agency/entity contact information specific to the project site for providing medical attention for injured or disabled employees and include first-aid response and materials and products safety information specific to the project Work.

1.5 ENVIRONMENTAL PROCEDURES

A. GENERAL ENVIRONMENTAL PROCEDURES

1. The Government reserves the right to authorize government or government contracted resource specialists within the Work sites and areas to monitor construction on behalf of the government for damage to natural, cultural, or historic resources.

2. When not specifically identified for specific components of the Work in other specification sections or when not specifically called for on the drawings, the Contracting Officer will notify the Contractor in writing if the BLM will authorize any individuals to perform this task for any portions of the Work.

B. ENVIRONMENTAL PROTECTION PROCEDURES

1. Perform construction activities by methods that will prevent entrance, or accidental spillage, of solid matter, contaminants, debris, or other pollutants or wastes into streams, flowing or dry watercourses, lakes, wetlands, reservoirs, or underground water sources. Such pollutants and wastes include: refuse, garbage, cement, sanitary waste, industrial waste, hazardous materials, radioactive substances, oil and other petroleum products, aggregate processing tailings, mineral salts, and thermal pollution.

2. Litter and Waste: Litter and waste generated by Contractor personnel shall be collected daily and disposed of according to Federal, State, and local regulations; burning is not permitted.

3. Materials designated as construction waste shall be disposed of off the National System of Public Lands according to Federal, State, and local regulations regarding disposal of construction waste.

4. Vehicles and equipment shall be maintained in such a condition to prevent spills and leaks of fuels and other fluids. Drip cloths shall be used beneath equipment while parked overnight.

5. Secondary containment for any onsite fuel tanks and spill kits shall be utilized.

   a. Fuel or oil spills less than five (5) gallons occurring during the work of this project shall be excavated to a depth of 12 inches beyond contaminated material in all directions, removed from the work location and handled and disposed according to Federal, State, and local regulations regarding disposal of Petroleum, Oils, and Lubricants. Voids left by removed materials shall be backfilled and compacted.
with free-draining, approved materials to blend with the contours of the surrounding terrain or constructed grades at the Contractor’s expense.

C. NATURAL RESOURCES PROTECTION PROCEDURES

1. Desert Tortoise / Gila Monsters / Wildlife:
   a. Collection, harassment, and disturbance of desert tortoises and gila monsters are prohibited by Arizona State Law. If encountered, they should be avoided. If a desert tortoise is encountered and cannot be avoided, it should be carefully moved to safety by gently picking it up and carrying it horizontal to the ground, not tilted, and placed in the shade the minimum distance needed to remove it from harm’s way. Gila monsters should be avoided and not handled. They can inflict a serious and painful bite.

2. Landscape Preservation:
   a. Preservation: Preserve natural landscape and protect existing vegetation not authorized to be removed. Conduct operations to prevent injury to natural surroundings in vicinity of Work. Move crews and equipment within rights-of-way and over routes provided for access to Work in manner to prevent damage to grazing land, crops, or property.
   b. Protection: Protect vegetation from damage or injury caused by construction operations, personnel, or equipment by use of protective barriers or other methods approved by Contracting Officer. Provide access routes as approved by Contracting Officer.
   c. Anchorage: Do not use trees for anchorages.
   d. Damaged Vegetation: Repair or treat injured vegetation; replace trees or shrubs as directed by Contracting Officer at no cost to the Government.
   e. Contractor shall be responsible for injuries to vegetation caused by Contractor operations, personnel, or equipment.
   f. Repair or treat damaged vegetation, without delay as recommended by and under direction of experienced horticulturist or licensed tree surgeon.
   g. Restore temporary roads to original landscape contours and make impassable to vehicular traffic when no longer required. Scarify and re-grade Government land used for construction purposes and not required for completed installation so that surfaces blend with natural terrain and are in a condition that will facilitate natural re-vegetation, provide proper drainage and prevent erosion.
   h. Replant graded areas of Government land used for construction purposes and other areas where vegetation has been destroyed or damaged by operations. Reseed the area(s), as recommended by experienced local horticulturist, with native plant species, or other approved perennial species.
   i. Replacement: Remove damaged or injured trees or shrubs as directed by Contracting Officer. Replace removed trees or shrubs with new of same species, or other approved species, of maximum size practicable to plant and sustain in particular environment. Guy as required, water, and maintain replacement trees and shrubs for period of one year. Remove and replace replacement trees or shrubs that die within one year of planting.
3. Vegetation Management:

   a. Each vehicle accessing the project site shall be thoroughly washed/rinsed at the nearest practicable location prior to leaving paved surfaces to minimize transfer of noxious, invasive, or non-native plant seeds or other deleterious materials. After this initial wash/rinse, only those vehicles which have never entered the site or which are reentering the site after having traveled a distance more than 100 miles from the project site shall be washed/rinsed prior to entering the site.

D. FIRE RESTRICTIONS PROCEDURES

1. The Contracting Officer will notify the Contractor of any Fire Restrictions in effect for the project area at the time of the Pre-Construction Conference.

2. Fire Restrictions are more likely to be issued for geographical areas of the southwest United States during late spring through early fall than at other times of the year. Fire restrictions ordered by the Bureau of Land Management will be posted at the following public website:


3. Restrictions and requirements for construction activities when Fire Restrictions are in effect will be detailed in the public order signed and distributed by the BLM at the time of implementation. If Fire Restrictions are implemented during the Contract Period of Performance, notify the Contracting Officer immediately if the Fire Restrictions will adversely impact the project.


1.6 SECURITY PROCEDURES

A. MAINTENANCE OF ACCESS GATES FOR INGRESS AND EGRESS EVENTS

1. Government Access Gates: There are two (2) locked, road closure gates through which vehicles must pass to gain access to Partner’s Point Work Yard. One is the “Entrance Road Gate” located next to the Town of Lake Havasu Work Yard at the end of Sweetwater Avenue where the access road turns 90 degrees towards the lake and the second is the “Work Yard Gate” that provides access to Partner’s Point Work Yard.

2. BLM maintains these gates in the open position Monday – Thursday, 7:00 AM – 1:00 PM. BLM maintains these gates in the closed and locked position at all other times. These procedures will be maintained for these two (2) gates throughout duration of construction.

3. The Entrance Road Gate currently uses three (3) locks and the Work Yard Gate uses one (1) lock.

4. The Contractor shall install a 3rd (temporary) gate and fencing to restrict project access to only individuals authorized by the BLM Contracting Officer and the Contractor; this gate will be referred to as the “Project Gate”. Refer to SECTION - TEMPORARY FACILITIES AND CONTROLS.

   a. Contractor will provide their own locking devices for the three (3) gates to be interlocked with existing locks; interlocking methods will be field-approved by the Contracting Officer. Contractor’s locking devices shall be removed upon completion of construction.
1.7 CULTURAL / HISTORIC RESOURCES PROTECTION PROCEDURES

A. REGULATION

1. If in connection with operations under this authorization, any archaeological or historical artifacts, human remains, funerary objects, sacred objects or objects of cultural patrimony as defined in the Native American Graves Protection and Repatriation Act (PL 101-601; Stat. 3048; 25USC 3001) are discovered, the contractor shall stop operations in the immediate area of the discovery, protect the remains and objects, and immediately notify the Contracting Officer of the discovery. The Contractor shall continue to protect the immediate area of the discovery until notified in writing by the Contracting Officer that operations may resume.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 35 00
PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for Contractor’s quality assurance and quality control activities.
   1. The work shall comply with regulations, codes and standards applicable to each product and the type of work as shown on the drawings and described in the specifications.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with Contract requirements.
   1. Specified tests, inspections, and related actions are in addition to Contractor's other quality control procedures that facilitate compliance with the Contract Documents.
   2. Requirements for Contractor to provide quality control services specified by Government or by authorities having jurisdiction are not limited by provisions of this Section.

1.2 SUBMITTALS

A. Qualification Data: For testing agencies specified in "Quality Assurance" paragraph to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
   1. Quality Control Firm/ Inspectors
   2. Special Inspector Firm/Inspector for monitoring sheetpile installation

B. Reports: Prepare and submit certified written reports that include the following:
   1. Date of issue.
   2. Project title and number.
   3. Name, address, and telephone number of testing agency.
   4. Dates and locations of samples and tests or inspections.
   5. Names of individuals making tests and inspections.
   6. Description of the Work and test and inspection method.
   8. Complete test or inspection data.
   9. Test and inspection results and an interpretation of test results.
   10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
   11. Comments or professional opinion on whether tested or inspected Work complies with the Contract.
   12. Name and signature of laboratory inspector.
   13. Recommendations on retesting and re-inspecting.
C. Permits, Licenses, and Certificates: For Government records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

D. Interpretation: When requested by the Contracting Officer, provide interpretation of test results.

1.3 REGULATORY REQUIREMENTS

A. Referenced Regulatory Requirements: Wherever the following acronyms are used in these specifications or on the drawings, they are to be construed the same as the respective expressions represented. Applicable sections of the referenced regulations are identified in the individual specification sections. Copies of the regulations referred to may be procured by the Contractor from the publishing entity. Regulatory standards include, but are not limited by the following list:

- CFR: CODE OF FEDERAL REGULATIONS
- DIAR: DEPARTMENT OF INTERIOR ACQUISITION REGULATIONS
- FAR: FEDERAL ACQUISITION REGULATIONS
- PL: PUBLIC LAW
- USC: UNITED STATES CODE

B. Permit Requirements: Permits that are the responsibility of the Contractor are identified in the individual specification sections. Jurisdictional Authorities for this Contract include, but are not limited by the following list:

- ADWR: ARIZONA DEPARTMENT OF WATER RESOURCES
- ADEQ: ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
- BLM: BUREAU OF LAND MANAGEMENT
- BOR: BUREAU OF RECLAMATION
- COE: CORPS OF ENGINEERS
- CITY OF LAKE HAVASU: LOCAL GOVERNMENT
- EPA: ENVIRONMENTAL PROTECTION AGENCY
- COAST GUARD: WATERWAYS MANAGEMENT DIVISION

1.4 ABBREVIATIONS AND ACRONYMS

A. Abbreviations and Acronyms are identified in the individual specification sections.

B. Specifications Formats and Conventions:
1. Specification Format: The Outline Specifications provided by the Government are organized into Divisions and Sections using the 50-division format of CSI/CSC's "MasterFormat" numbering system.

2. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

3. This Contract incorporates materials, applications, and tests by reference, with the same force and effect as if they were given in full text.

4. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.

5. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.

6. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

7. Terminology: In the Outline Specifications edited and finalized by the Contractor and through the end of the specifications, all references to “Owner” shall be replaced with the term “Government” or “Contracting Officer” (when referring to the person acting for the Government). All references to “Engineer” or “Architect” shall be replaced with the term “Contracting Officer”.

1.5 SECTION 01 42 16 - DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Contracting Officer.

C. Mockups: Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Approved mockups establish the standard by which the Work will be judged.

D. Laboratory Mockups: Full-size, physical assemblies that are constructed at testing facility to verify performance characteristics.

E. Preconstruction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.

F. Product Testing: Tests and inspections that are performed by an Nationally Recognized Testing Laboratory (NRTL), an National Voluntary Laboratory Accreditation Program (NVLAP), or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.
G. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.

H. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

I. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

J. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.

K. Experienced: When used with an entity, "experienced" means having successfully completed a minimum of 3 previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

L. Registered Land Surveyor: An individual or company possessing a valid state certificate as a “Registered Land Surveyor” from the State in which they practice and from the State or Jurisdiction where surveying work is required.

1. The term “Registered Land Surveyor” shall also include Professional (Civil) Engineers authorized to practice Land Surveying under the laws of the State in which they practice.

M. Professional (Civil) Engineer: An individual or company possessing a valid state license as a “Professional Engineer” from the State in which they practice and from the State or Jurisdiction where engineering work is required.

1.6 SECTION 01 42 19 – REFERENCE STANDARDS

A. Referenced Specifications and Standards: Wherever the following acronyms are used in these specifications or on the drawings, they are to be construed the same as the respective expressions represented. Applicable sections of the reference standards are identified in the individual specification sections. Copies of the referenced specifications and standards referred to may be procured by the Contractor from the publishing entity. Reference standards include, but are not limited by the following list:

- AASHTO
- ACI
- ADOT
- AISC
- ANSI

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
AMERICAN CONCRETE INSTITUTE
ARIZONA DEPARTMENT OF TRANSPORTATION
AMERICAN INSTITUTE OF STEEL CONSTRUCTION
AMERICAN NATIONAL STANDARDS INSTITUTE
1.7 SECTION 01 43 00 - QUALITY ASSURANCE

A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that is similar to those indicated for this Project in material, design, and extent.

F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirements for specialists shall not supersede building codes or regulations governing the Work.

G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections:

1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
3. The qualified, independent testing laboratory, which will be conducting the specific tests required in this contract, must have authority or be licensed to operate in the State in which the project is located.
4. The testing laboratory shall be approved by the Contracting Officer prior to the Contractor beginning work.

H. Special Inspector Qualifications: Special inspector experienced, as defined herein, with pile driving equipment and metering devices used to establish equipment calibration and controls for steel sheet pile driving and performance of the installation equipment during installation.

I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

J. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups in location and of size indicated or, if not indicated, as directed by Contracting Officer.
2. Notify Contracting Officer seven days in advance of dates and times when mockups will be constructed.
3. Demonstrate the proposed range of aesthetic effects and workmanship.
4. Obtain Contracting Officer's approval of mockups before starting work, fabrication, or construction.
5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
6. Demolish and remove mockups when directed, unless otherwise indicated.

1.8 QUALITY CONTROL

A. Government Responsibilities: Where quality-control services are indicated as Government responsibility, Government will engage a qualified testing agency to perform these services.
1. Contracting Officer will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.

2. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor – no cost to the Government.

B. Tests and inspections not explicitly assigned to Government are Contractor's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.

1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
   a. Contractor shall not employ same entity engaged by Government, unless agreed to in writing by Contracting Officer.

2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.

3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.

4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.

5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Conflicts: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Contracting Officer for a decision before proceeding.

D. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 1 Section "Submittal Procedures."

E. Retesting/Re-inspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and re-inspecting, for construction that replaced Work that failed to comply with the Contract Documents.

F. Testing Agency Responsibilities: Cooperate with Contracting Officer and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections:

1. Provide qualified personnel at project site. Cooperate with the Contracting Officer and Contractor in performance of services.

2. Perform specified sampling and testing of products and materials in accordance with specified standards.

3. Notify Contracting Officer and Contractor promptly of irregularities or deficiencies observed in the Work during performance of services.

4. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
5. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.

6. Test samples of mixes submitted by the Contractor.

7. Ascertain compliance of materials and mixes with requirements of specifications.

8. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.

9. Perform additional tests required by the Contracting Officer.

10. Laboratory may not release, revoke, alter, or enlarge on requirements of specifications.

11. Laboratory may not approve or accept partial portions of the work.

12. Laboratory may not assume or perform duties of the Contractor.

G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.

2. Incidental labor and facilities necessary to facilitate tests and inspections.

3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.

4. Facilities for storage and field curing of test samples.

5. Delivery of samples to testing agencies.

6. Preliminary design mix proposed for use for material mixes that require control by testing agency.

7. Security and protection for samples and for testing and inspecting equipment at Project site.

H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting. Schedule times for tests, inspections, obtaining samples, and similar activities.

1.9 FIELD QUALITY CONTROL PROCEDURES

A. Contractor Requirements: See below and individual specifications "Quality Control" paragraph for specific testing requirements. When applicable, the Contractor shall:

1. Deliver to agency or laboratory at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs.

2. Cooperate with laboratory personnel, and provide access to the Work.

3. Protect construction exposed by or for quality-control service activities.

4. Provide incidental labor and facilities to:
   a. Obtain, handle, and label or identify samples at the site or at the source of items to be tested.
   b. To facilitate tests.
   c. To provide storage and curing of test samples.
5. Ensure samples are taken by qualified testing personnel.
6. Coordinate the laboratory test frequency and timing with the Contracting Officer.
7. Ensure tests are completed according to the testing schedule.
8. Furnish test reports within 5 working days after tests have been completed.

### SECTION 01 45 29 – TESTING LABORATORY SERVICES

A. In addition to the Contractor’s quality assurance and quality control responsibilities described in the individual specification sections, the following tests shall be performed:

<table>
<thead>
<tr>
<th>Material Type</th>
<th>Location</th>
<th>Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Backfill</td>
<td></td>
<td>1 test per material type, per source</td>
<td>Standard Proctor</td>
</tr>
<tr>
<td>Structural</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Backfill</td>
<td></td>
<td>1 test per material type, per source</td>
<td>Gradation</td>
</tr>
<tr>
<td>Structural</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Backfill</td>
<td></td>
<td>1 test per material type per source</td>
<td>Additional Standard Materials Property Tests required per Specifications</td>
</tr>
<tr>
<td>Structural</td>
<td>Behind walls</td>
<td>1 test per 50 linear feet per lift</td>
<td>Density Test</td>
</tr>
<tr>
<td>Backfill</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Embankment</td>
<td>Below footings and slab</td>
<td>1 test per 1,000 square feet</td>
<td>Density Test</td>
</tr>
<tr>
<td>Fill</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Embankment</td>
<td></td>
<td>1 test per material type, per source</td>
<td>Standard Proctor</td>
</tr>
<tr>
<td>Fill</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Embankment</td>
<td></td>
<td>1 test per material type, per source</td>
<td>Gradation</td>
</tr>
<tr>
<td>Fill</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Embankment</td>
<td></td>
<td>1 test per material type per source</td>
<td>Additional Standard Materials Property Tests required per Specifications</td>
</tr>
<tr>
<td>Fill</td>
<td>Below footings and slab</td>
<td>1 test per 1,000 square feet</td>
<td>Density Test</td>
</tr>
<tr>
<td>Embankment</td>
<td>Below footings and slab</td>
<td>1 test per 1,000 square feet taken 12 inches below finished grade / subgrade</td>
<td>Density Test</td>
</tr>
<tr>
<td>Fill</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material Type</td>
<td>Location</td>
<td>Frequency</td>
<td>Remarks</td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------------------------------</td>
<td>------------------------------------------------</td>
<td>----------------------------------------------</td>
</tr>
<tr>
<td>Subgrade excavation</td>
<td>Below aggregate base course and gravel mulch</td>
<td>1 test per 1,000 square feet At least two tests shall be made for each type of fill material placed.</td>
<td>Density Test</td>
</tr>
<tr>
<td>Aggregate base course</td>
<td></td>
<td>1 test per material type, per source</td>
<td>Standard Proctor</td>
</tr>
<tr>
<td>Aggregate base course</td>
<td></td>
<td>1 test per material type, per source</td>
<td>Gradation</td>
</tr>
<tr>
<td>Aggregate base course</td>
<td></td>
<td>1 test per material type per source</td>
<td>Additional Standard Materials Property Tests required per Specifications</td>
</tr>
<tr>
<td>Aggregate base course</td>
<td>Under slabs and footings</td>
<td>1 test every 50 linear feet under wall footing 1 test per 1000 square feet for the slab</td>
<td>Density Test</td>
</tr>
<tr>
<td>Aggregate base course</td>
<td>Vehicle access ramp</td>
<td>2 tests</td>
<td>Density Test</td>
</tr>
<tr>
<td>Structural Concrete</td>
<td>All concrete</td>
<td>1 per 9 cubic yards, minimum of 1 per truck load</td>
<td>Slump Test</td>
</tr>
<tr>
<td>Structural Concrete</td>
<td>All concrete</td>
<td>1 per 9 cubic yards, minimum of 1 per truck load</td>
<td>Temperature</td>
</tr>
<tr>
<td>Structural Concrete</td>
<td>Walls and slabs</td>
<td>1 set of six cylinders per 50 cubic yards of concrete per class / mix 1 set of six cylinders for every 100 linear feet of wall, minimum of 1 per shift</td>
<td>Making and testing of compressive strength concrete cylinders</td>
</tr>
<tr>
<td>Structural Concrete</td>
<td>Anchor Blocks</td>
<td>1 set of six cylinders per block</td>
<td>Making and testing of compressive strength concrete cylinders</td>
</tr>
<tr>
<td>Structural Concrete</td>
<td></td>
<td>1 test per material type per source</td>
<td>Additional Standard Materials Property Tests required per Specifications</td>
</tr>
<tr>
<td>Bedding and backfill</td>
<td>Trenches</td>
<td>1 test per material type, per 50 linear feet in each lift, in each trench</td>
<td>Density Test</td>
</tr>
</tbody>
</table>
1.11 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Conducted by a qualified testing agency with special inspector or independent special inspector as required by this contract, as indicated in individual Specification Sections, and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
2. Notifying Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submitting a certified written report of each test, inspection, and similar quality-control service to Contractor and to authorities having jurisdiction.
4. Submitting a final report of special tests and inspections prior to Final Inspection that includes a list of unresolved deficiencies.
5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
6. Retesting and re-inspecting corrected work.

B. The following special tests and/or inspections shall be performed:

1. Verification and documentation of calibration for pile driving equipment meters and devices
2. Establishing pile driving controls parameters and/or equipment settings
3. Monitoring, documenting and reporting pile driving equipment performance during installation to determine equipment adjustments necessary to facilitate installation that will provide the warranty and life expectancy for the seawall specified within this Contract.

END OF SECTION 01 40 00
SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes requirements for temporary utilities, temporary field office, first aid, sanitary facilities, other support facilities, vehicular access, security and protection facilities, temporary barriers and controls, and project identification.

1.2 APPLICABLE CODES

A. CODE OF FEDERAL REGULATIONS (CFR):

1. 33 CFR, Part 323 Permits for Discharges of Dredged or Fill Material into the Waters of the United States
2. 40 CFR, Part 112 Oils Pollution Prevention
3. 40 CFR, Part 122 EPA Administered Permit Programs: The National Pollutant Discharge Elimination System
4. 40 CFR, Part 123 State Program Requirements
5. 40 CFR, Part 230 Section 404(b)(1) Guidelines for Specifications of Disposal Sites for Dredged or Fill Material
6. 40 CFR, Part 231 Section 404(c) Procedures

B. FEDERAL ACQUISITION REGULATIONS

1. FAR 52.235-7 Permits and Responsibilities

C. PUBLIC LAW

1. Sections 311, 402, and 404 Clean Water Act (Public Law 92-500, as amended)

1.3 DEFINITIONS

A. Permanent Enclosure: As determined by Contracting Officer, permanent or temporary roofing is complete, insulated, and weathertight; exterior walls are insulated and weathertight; and all openings are closed with permanent construction or substantial temporary closures.

B. Landscape Preservation: The term “injury” as such relates to landscape preservation includes, without limitation, bruising, scarring, tearing, and breaking of roots, trunks, or branches. Injury also includes damage to root systems from contractor equipment leaking oil, hydraulic fluid, or other toxic chemicals.

C. Pesticides: Includes herbicides, insecticides, fungicides, rodenticides, piscicides, avicides, surface disinfectants, animal repellents, and insect repellents.

D. Restricted Area: An area where entry will not be allowed unless authorized by Contracting Officer.

E. Security Measures: Measures contained in regulations or as may be established by Contracting Officer and carried out by Federal guard system to provide continuous and effective security of restricted areas.
1.4 USE CHARGES

A. Cost or use charges, for temporary facilities provided by the Contractor and installed and used by the Contractor shall be included in the Contract Sum.

1.5 SUBMITTALS FOR CONSTRUCTION

A. Temporary Utilities: There are no submittal requirements for temporary utilities. There are no utilities available for temporary construction use at the site. Site electrical service is supplied by an on-site solar unit which is not sufficient enough for both construction purposes and Government activities at the same time. No local phone service is available. The Contractor shall be responsible for utilities required for construction purposes. The Contractor shall be responsible for site construction debris removal through the local vendor. The location of the Contractor’s dumpster shall not interfere with activities or access to the Government dumpster.

B. Temporary Buildings: Submit Contractor’s Field Office proposal to include manufacturer’s specification and product data for materials, floorplan, dimensions, and pertinent data reflecting compliance with these specifications.

C. Air Pollution Control: Submit a Fugitive Dust Control Plan.

D. Section 402, Clean Water Act; National Pollutant Discharge Elimination System: Arizona Department of Environmental Quality administers NPDES requirements for the project location.

1. This project is subject to the Arizona Pollutant Discharge Elimination System (AZPDES) storm water requirements for construction sites under the Arizona Department of Environmental Quality’s (ADEQ’s) General Permit for Arizona. Under requirements in place at the time of contract solicitation, a Storm Water Pollution Prevention Plan and NPDES/AZPDES Permit is not required:
   a. This project has less than one (1) acre of disturbance; and, the horizontal distance from the project site to navigable waters is essentially negligible;
   b. Lake Havasu and the reach of Colorado River in this area are not designed Impaired Waters;

2. Submit an Erosion, Sediment and Storm Water Control Plan
   a. Arizona SWPPP Checklist is included with the Solicitation for Contractor’s use in determining best management practices for the erosion and sediment controls required.
   b. Refer to SECTION – “TEMPORARY EROSION AND SEDIMENT CONTROL” for requirements.

E. Section 404, Clean Water Act: Permits for dredge and fill within navigable waters of the United States are administered by Corps of Engineers. This project shall comply with the terms of Nationwide Permit # 13. See Attached.

F. Section 311, Clean Water Act; Spill Prevention Control and Countermeasure Plan (SPCCP): Submit SPCC Plan where location of construction site is such that petroleum, oil or lubricants (POL) from accidental spillage could reasonably be expected to enter into or upon navigable waters of United States or adjoining shorelines or on project sites where aggregate storage of POL at site is over 1,320 gallons or single container has capacity in excess of 660 gallons. Submit SPCC Plan to Contracting Officer at the pre-construction conference. Plan shall have been reviewed and certified by registered professional engineer in accordance with 40 CFR, part 112, as required by section 311 of the Clean Water Act (Public Law 92-500 as amended).
1. In addition to the stipulations required within the SPCCP the construction operations involving refueling, servicing and maintenance of equipment and vehicles shall be conducted as specified in applicable paragraphs of SECTION 01 35 00 – SPECIAL PROCEDURES and paragraph Fire Prevention and Control in this Specification Section.

G. Noise Control Plan: Submit a Noise Control Plan; coordinate with Construction Schedule submittal.

H. Lighting Control Plan: There are no submittal requirements for lighting control.

I. Traffic Control Plan: There are no submittal requirements for traffic control unless required by jurisdictional authorizes along haul routes/public highways used by the Contractor to mobilize and deliver materials and equipment to the project site. When required by a jurisdictional authority, submit the copy of Traffic Control Plan which includes the approval provided by the applicable jurisdiction.

J. Landscape Protection Plan: There are no submittal requirements for landscape protection.

K. First Aid Plans: Submit first-aid/emergency action plan for providing medical attention for injured or disabled employees, including onsite emergency facilities and ambulance service, at the pre-work meeting before start of operations. Plan shall include names of emergency responders, phone numbers. First Aid Plan shall be included with the Accident Prevention/Construction Safety Plan/Health and Safety Plan.

1.6 QUALITY ASSURANCE

A. Electric Service: Comply with all NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.


1.7 REGULATORY REQUIREMENTS

A. Comply with industry standards and applicable laws and regulations of authorities having jurisdiction including following:

1. Building code requirements.
2. Haul routes, public highways, roads and bridges.
3. Health and safety regulations.
4. Utility company regulations.
5. Police, fire department, and rescue squad rules.
7. Prevention and control of air pollution.

B. The dam and hydraulic operations, flood and flow control for this dam and lake are administered by Bureau of Reclamation.
PART 2 - PRODUCTS

2.1 TEMPORARY CHAIN-LINK FENCING

A. Temporary Chain-Link Fencing: Fencing shall include minimum 1 1/2-inch, galvanized steel posts, and 2-inch square galvanized chain-link fabric minimum, 8 feet high, with galvanized steel lockable gates.

1. Provide project gate with height to match temporary chain-link fencing and width necessary to allow required construction equipment and delivery vehicles with materials on-board to pass through.

2.2 TEMPORARY FACILITIES

A. General: Temporary facilities, buildings, equipment or other materials used during the construction period shall be inspected routinely and maintained by the Contractor and shall be solely the Contractor’s responsibility for installation, maintenance and associated costs unless otherwise indicated.

B. Contractor’s Field Office, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading. Provide office for use of authorized construction personnel working at project site.

1. Provide incombustible construction for offices, shops, and sheds located within construction area. Comply with NFPA 241. Building construction materials shall be assembled such that rodents and insects are resisted from entry. Provide stable, secure access to the building entry doors.

2. Provide for first-aid, communications, adequate ventilation, light, heat or air-conditioning according to the season during which construction will occur, and an impervious floor.

C. Provide and maintain portable toilet for all construction personnel.

1. Self-contained, single-occupant toilet units of chemical, aerated recirculation, or combustion type. Provide units properly vented and fully enclosed with glass-fiber-reinforced polyester shell or similar nonabsorbent material.

D. Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Provide covered waste containers for used material.

E. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

F. Safety Fencing: Orange plastic fencing, 4-foot minimum height.

D. Tarpaulins: Waterproof, fire-resistant, UL-labeled tarpaulins with flame-spread rating of 15 or less. Provide translucent, nylon-reinforced, laminated polyethylene or polyvinyl chloride, fire-retardant tarpaulins for temporary enclosures.

E. Water: Provide potable water for employees to drink that is approved by local health authorities; potable water is not available for Contractor use at the site.

G. Temporary Enclosures: Provide temporary enclosures necessary for protection of construction, in progress or completed, from exposure, inclement weather and other operations.
2.4 EQUIPMENT

   A. Fire Extinguishers: Provide current and up to date serviced portable, UL rated 5-pound extinguisher with class and extinguishing agent as required by locations and classes of fire exposures. Extinguisher shall be located in a visible location within 10-feet of the flammable storage locker.

   B. Electrical Generators: Provide electrical power generators of appropriate size and power capabilities for construction purposes.

PART 3 - EXECUTION

3.1 INSTALLATION

   A. Locate temporary facilities where they will serve the project adequately and result in minimum interference with government and contractor’s performance of work. Relocate and modify facilities as required by progress of the work or as directed by the Contracting Officer.

   B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

   C. After removal of any temporary facilities, equipment or materials, site conditions on which they were placed shall be restored back to original condition.

3.2 CONTRACTOR’S FIELD OFFICE AND OTHER CONSTRUCTION BUILDINGS

   A. Size, location, and construction will be subject to Contracting Officer's approval.

   B. Contractor shall request permission in writing from the Contracting Officer to remove temporary facilities from the project site upon completion of the Work. Maintain construction buildings until approved for removal in writing by the Contracting Officer. Remove before Final Payment.

3.3 TEMPORARY INSTALLATIONS

   A. General: Utilities are not available for temporary construction purposes.

   B. Maintain support facilities until approved in Writing by the Contracting Officer. Remove before Final Payment.

   C. Potable Water: Potable water is not available at the site. Provide ‘Potable’ drinking water where construction workers have ready access to it. The location shall be signed with ‘Company’ name to distinguish between government water and contractor’s water supply.

   D. Sanitary Facilities: Provide temporary, portable sanitary facilities for use of construction personnel.
   1. Install self-contained portable toilet units within project limits; shield toilets to ensure privacy.
   2. Provide for routine cleaning and pumping and disposal of septic waste as needed.
   3. Replenish supplies for sanitary facilities as needed.

   E. Temporary service connections for electrical service are not available. Contractor shall be responsible for providing electrical power necessary for completing The Work.
1. Temporary Electrical: Temporary electrical work shall be according to NFPA 70 (NEC), Article 305.

F. Lighting: Provide temporary lighting as needed with switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

G. Temporary service connection for telecommunications is not available. Contractor shall be responsible for providing communications necessary for completing The Work. Cell phone coverage is available within the project area. Coverage varies by provider; Contractor shall verify coverage.

H. First-Aid Facilities: Locate on-site first-aid station in obvious and available location for providing emergency aid for personnel. Supply and maintain aid station as needed.

3.4 HAUL ROUTES, ROADWAYS, AND STORAGE/STAGING AREAS

A. Investigate condition of available public or private roads for clearances, restrictions, bridge-load limits, bond requirements, and other limitations that affect or may affect access and transportation operations to and from jobsite.

B. Established Roadways As Haul Routes: Use existing available public highways, roads as haul routes subject to applicable local regulations. Tracked equipment will be allowed only at immediate work site. Repair damage caused by construction traffic.

   1. Provide barricades, flags and road traffic control personnel, lighting, signs, and other necessary precautions for safety of public as needed where haul routes cross public highways or roads.
   2. Provide dust-control treatment that is nonpolluting and non-tracking on natural or aggregate surfaced roads. Reapply treatment as required to minimize dust.
   3. Use only BLM established roadways, areas, and haul routes, or temporary roadways, areas, or haul routes when and as authorized by the Contracting Officer.
   4. Contractor shall provide adequate means for cleaning trucks and/or other equipment of mud prior to entering public streets.

C. Storage/Staging Areas: Use of storage/staging areas within the site is limited. Only store/stage equipment and materials that the immediate fenced-off work area can accommodate. Trailers, materials, or equipment that will not fit into the fenced work area shall not be placed or stored, use the upper parking area assigned for additional storage/staging as needed. This upper parking area shall also be used to stage personal vehicles owned by construction personnel.

D. Maintenance: Maintain haul routes, roadways, parking and storage areas, in sound, smooth condition. Maintain areas until completion and acceptance of Work. Return to original or better condition after work completion.

E. Repairs: Promptly repair ruts, broken pavement, potholes, low areas with standing water, and other deficiencies caused by construction activities to roads, parking area surfaces and drainages to original or specified condition.

3.5 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Security of equipment, materials or other construction tools shall be the responsibility of the Contractor.

   1. Contractor’s access shall be as described in this section and SECTION– “SPECIAL PROCEDURES”.

B. Project Site Fence: Removing a portion of the existing chain-link fence which encloses the work yard is required to perform construction at the project site. This will compromise security of Partner’s Point Work Yard. As a minimum, the Contractor shall be required to construct temporary fencing prior to commencing construction which both encloses the work yard and separates the project site from the on-going operations of the work yard.

1. The Contractor may construct additional temporary fencing for construction purposes at the project site and at stockpile and staging areas as required to secure vehicles, equipment and materials.
   a. BLM will field-mark locations for temporary fencing prior to installation.
   b. Extent of Temporary Construction Fencing: As required to enclose Contractor’s work area(s) or portions determined sufficient to accommodate construction operations. Temporary fencing shall remain in place for the entire time work is in progress.
   c. Remove fencing after completion of work filling holes and restoring graded surfaces to original condition.
   d. Maintain security within the project site by limiting number of keys and restricting distribution to authorized personnel.

2. Project Gate: The Contractor is required to construct a section of temporary fencing that will separate the project site from Partner’s Point Work Yard. This section of fence will require a 3rd gate which will be referred to herein as “Project Gate”.
   a. The Contractor shall provide and install their locking devices on the Project Gate for providing construction access.
   b. BLM will provide their locking devices for the Project Gate
   c. Interconnection of Contractor’s locking devices with the BLM locking devices on the Project Gate for a double locking configuration will be field-approved by the Contracting Officer.

C. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

1. Construct fence, barricade, or otherwise block off immediate work area to prevent unauthorized entry.
2. Illuminate barricades and obstructions at night; keep safety lights on sunset to sunrise.
3. Adequately barricade and post open cuts in or adjacent to thoroughfares.
4. Protect pedestrian traffic with guardrails or fences.
5. When pedestrian traffic is detoured onto a roadway, provide temporary walkways. Provide ramps at changes in elevation of walkways.
6. Cover pipes, hoses, and power lines crossing sidewalks and walkways with troughs using beveled edge boards.

3.6 ENVIRONMENTAL POLLUTION CONTROL

A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects. Clean-up of environmental spills or damage resulting from contracting operations shall be corrected at Contractor’s expense.
B. Construction Site Management: Perform construction activities by methods that will prevent entrance, or accidental spillage, of solid matter, contaminants, debris, or other pollutants or wastes into streams, flowing or dry watercourses, lakes, wetlands, reservoirs, or underground water sources. Such pollutants and wastes include: refuse, garbage, cement, sanitary waste, industrial waste, hazardous materials, radioactive substances, oil and other petroleum products, aggregate processing tailings, mineral salts, and thermal pollution.

1. Do not stockpile or deposit excavated materials or other construction materials, near or on, stream banks, lake shorelines, or other watercourse perimeters where they can be washed away by high water or storm runoff, or can in any way encroach upon watercourse.

C. FIRE PREVENTION AND CONTROL

1. The Contractor shall implement the following procedures throughout duration of construction unless otherwise required by Fire Restrictions:
   a. Smoking may be restricted during times of Significant or High Fire Danger; coordinate with Contracting Officer regarding current Fire Restrictions throughout Contract duration.
   b. Responsible Person: A capable and qualified person shall be placed in charge of fire protection. The responsibilities shall include locating and maintaining fire protective equipment, establishing and maintaining safe torch cutting and welding procedures and performing as look-out during such procedures.
   c. Hazard Control: Take all necessary precautions to prevent fire during contract duration. Do not store flammable or combustible liquids in existing buildings. Provide adequate ventilation during use of volatile or noxious substances.
   d. Service and Refueling Areas: Vehicle Service and refueling shall be performed safely, minimizing risk of ignition using spill kits.
   e. Materials, products, methods and processes used to refuel or service equipment shall be as described in the specifications, meet or exceed applicable Federal Regulations and Public Laws and be defensible with respect to procedures that may be interpreted as representative of industry recognized best practices for limiting ignition due to proximity and interaction of flammable materials and sources of sparks or open flame.
   f. Smoking is prohibited in the vicinity of construction activities involving products and processes which are flammable or otherwise susceptible to ignition. Smoking is prohibited in the vicinity of propane storage and distribution.
   g. Welding/Grinding: Cutting by torch, welding or grinding shall be performed only when adequate fire protection is provided and specifically approved by Contracting Officer.
   h. Travel distance from any work station to the nearest extinguisher shall not exceed 75 feet.
   i. Provide one extinguisher on each vehicle or piece of equipment.
   j. Cooking and warming fires are prohibited in conjunction with this Contract.
   k. Burning construction waste or garbage is prohibited in conjunction with this Contract.

3.7 AIR POLLUTION CONTROL

A. Fugitive Dust Control Plan: The Contractor’s Fugitive Dust Control Plan shall provide for proactive and positive methods for application of dust control materials that minimize rising of dust from construction operations; and prevent airborne dust from dispersing into the atmosphere for duration of Work, day or night.
B. Requirements: Utilize such methods and devices as are reasonably available to prevent, control, and otherwise minimize atmospheric emissions or discharges of air contaminants. The following requirements shall be added:

1. Provide measures to prevent discharge of airborne dust to adjacent properties, walkways and waterways. Do not operate equipment and vehicles that show excessive emissions of exhaust gases until corrective repairs or adjustments reduce such emissions to acceptable levels.

2. Provide dust control and abatement during construction. Prevent, control and abate dust pollution within project site.

3. Provide labor, equipment, and materials, and use efficient methods wherever and whenever required for preventing dust nuisance or damage to persons, property, or other activities including wildlife habitats, dwellings and residences, agricultural activities, recreational activities, traffic, and similar conditions.

4. Provide means for minimizing atmospheric discharges of dust during mixing, handling, and storing of cement, pozzolan, and concrete aggregate.

5. Burning is not permitted.

C. Contractor Air Pollution Violations: Government may stop construction activity contributing to air pollutant levels which are excessive or in violation of Federal, State, or local laws. Expenses resulting from work stoppage and damages as a result of Contractor’s operations which violate Federal, State, or local laws will be responsibility of Contractor.

3.8 WATER POLLUTION CONTROL

A. Contractor Water Pollution Violations: If noncompliance should occur, report noncompliance to Contracting Officer immediately (orally), then with specific information submitted in writing within two calendar days. Immediately stop all activities that caused the pollution until corrected. Consistent violations of applicable Federal, State, or local laws, orders, regulations, or Water Quality Standards may result in Contracting Officer stopping site activity until compliance is ensured. Contractor shall not be entitled to extensions of time, claims for damage, or additional compensation by reason of such work stoppages. Corrective measures required to bring activities into compliance shall be at Contractor's expense.

1. The Contractor shall not install, operate or maintain fuel storage or dispensing facilities and/or containment or equipment / vehicle maintenance facilities on the National System of Public Lands in conjunction with this Contract.

2. The Contractor may service and refuel equipment onsite as described in the specifications.

B. Comply with stipulations indicated in the approved SPCCP.

C. Clean Water Act

1. Government has made application for permit as required under Section 404 of Clean Water Act (Public Law 92-500 as amended). USCOE Approval Letter and Section 404 Nationwide Permit Number 13 - Bank Stabilization are attached.

   a. Terms and Conditions: Comply with terms and conditions/stipulations as stated in permit.

   b. Do not operate mechanized equipment in navigable waters without first obtaining Section 404 permit, and then only construct according to Section 404 Permitted Stipulations.
2. Section 402: NPDES Permit not required. Submit Erosion, Sediment and Storm Water Control Plan
   a. Terms and Conditions: Refer to submittal requirements above and SECTION –
      “TEMPORARY EROSION AND SEDIMENT CONTROL”.

3.9 NOISE CONTROL

A. General: City of Lake Havasu Noise Ordinance exempts construction activities by governments. Facilities
   within immediate vicinity of the project site include private residences, state and local work yards, and the
   office building occupied by BLM Lake Havasu Field Office and BLM Colorado River District Office and the
   Partner’s Point Work Yard.

B. Noise Control Plan: Drilling, jackhammering, pile driving, or other operations producing high-intensity
   impact noise shall be performed at the times indicated on the approved construction schedule.

3.10 LIGHT CONTROL

A. Provide light control during construction as needed. Direct stationary floodlights to shine downward at an
   angle less than horizontal.
   1. Shield floodlights so that floodlights will not be nuisance to surrounding areas.
   2. Direct lighting so that residences are not in direct beam of light.
   3. Correct lighting control problems when they occur as approved by Contracting Officer.

3.11 OPERATION, TERMINATION, AND REMOVAL OF TEMPORARY FACILITIES

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit
   availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain temporary structures, facilities and controls in good operating condition as required
   for safe and proper completion of Work and as directed by Contracting Officer.

C. Termination and Removal: Remove temporary structures, facilities, and controls when need for its service
   has ended, when it has been replaced by authorized use of a permanent facility, and when approved in
   writing by the Contracting Officer. Complete or, if necessary, restore permanent construction that may have
   been delayed because of interference with temporary facility. Repair damaged Work, clean exposed
   surfaces, and replace construction that cannot be satisfactorily repaired.
   1. Materials and facilities that constitute temporary facilities are property of Contractor.
   2. Remove construction debris, waste materials, and packaging material from work site daily. Clean dirt
      or mud tracked onto paved or surfaced roadways.
   3. Upon completion of project and after removal of trailers, materials, and equipment from within fenced
      area, remove fence. Restore areas used by Contractor for storage of equipment or material, or other
      use, to original or better condition. Restore area to original condition, including aggregate surfacing.
   4. Prior to Final Inspection, clean and renovate permanent facilities used during construction period.
      Comply with final cleaning requirements

END OF SECTION 01 50 00

Stantec Consulting Services Inc.
Partners Point Seawall – L14PD01347 01 50 00 - 10
PART 1: GENERAL

1.1 SUMMARY

A. Section Includes:

1. Provide labor, equipment and materials to install, maintain and remove a floating turbidity barrier to contain sediment, soil, and debris which might be disturbed or migrate into the adjacent lake during the construction operations.

2. Provide labor, equipment and materials to install, maintain and remove silt fencing and other necessary best management practices to control and prevent sediment erosion and discharge at site perimeter.

3. Install, monitor, and maintain temporary erosion and sediment control devices according the approved Erosion, Sediment and Storm Water Control Plan.

B. Turbidity Barrier

1. Turbidity barrier shall be designed with impermeable fabric.

2. Turbidity barrier shall be designed for areas with moving water, currents, waves or tides.

3. Assume waves are up to two feet (2’), moderate wind, and currents less than 1 knot.

4. Turbidity barrier shall be heavy duty and designed for protection of dredging, pile driving and shoreline construction.

C. Silt Fence

1. Provide temporary silt fences to minimize erosion and sediment runoff.

2. Properly install silt fences to effectively retain sediment immediately after completing each phase of work where erosion would occur in the form of sheet and rill erosion (e.g. clearing and grubbing, excavation, embankment, and grading).

3. Install silt fences in the locations indicated on the approved Erosion, Sediment and Storm Water Control Plan.

4. Obtain approval from the Contracting Officer prior to final removal of silt fence barriers.

5. Drainage area shall not exceed 1/4 acre per 100 feet of fence length.

6. Slope length (greater than 2 percent) above the fence shall not exceed 100 feet.

1.2 SUBMITTALS

A. Certificates of Conformance: Submit 3 copies of written certification from the manufacturer of the geotextile fabric to be used for both turbidity barriers and silt fence that it conforms to the requirements of this Section.

B. Refer to Section, “Temporary Facilities and Controls” for additional submittal requirements for erosion and sediment controls.
C. Submittals shall be per Section – Administrative Requirements, Paragraph – Submittal Procedures.

PART 2: PRODUCTS

2.1 MATERIALS

A. Turbidity Barrier

1. Fabric: fabric shall be ultra-violet resistant 22 ounce minimum weight poly vinyl chloride.

2. Floats: Dense foam, sealed polyethylene or rubber floating devices in sufficient numbers and with sufficient buoyancy to float the curtain. Floats shall be firmly attached to the curtain so they will not come loose if impacted by wave or weather action. Floats shall be of a color that is highly visible in the water (white, yellow, red, orange). The floats shall be sufficient to maintain the curtain floating a maximum of six (6)-inches below the surface. Floats shall be minimum eight (8) inches in diameter.

3. Ballast: Bottom ballast shall be 5/16” steel chain or equivalent.

4. Tension Cable: Cable shall be 5/16” steel cable.

B. Silt Fence

1. Provide geotextile that complies with the requirements of ASTM D4439.

2. Provide synthetic filter fabric that contains ultraviolet inhibitors and stabilizers to assure a minimum of six months of expected usable construction life at ambient temperatures.

3. The filter fabric shall meet the following minimum requirements:
   i. Grab Tensile Elongation shall be 15% per ASTM D4632.
   ii. Trapezoidal Tear shall be 55 pounds per ASTM D4533.
   iii. Permittivity shall be 0.1 sec-1 per ASTM D4751.
   iv. AOS shall be between 20 – 100 per ASTM D4751.
   v. UV Resistance shall be 80% after 500 hours per ASTM D4355.

C. Other Erosion Control Devices

1. Provide measures to prevent soil erosion and discharge of soil-bearing water runoff to adjacent properties, walkways and waterways. Provide barriers in and around excavations and subgrade construction to prevent flooding and erosion by storm water runoff. Control pollutants by use of sediment and erosion controls, wastewater and storm water management controls, construction site management practices, and other controls including State and local requirements. Include the following:
   i. Sediment and Erosion Control Measures: Establish methods for controlling sediment and erosion which address vegetative practices, structural control, silt fences, straw dikes, sediment controls, and controls as appropriate. Institute storm water management measures including velocity dissipaters, and solid waste controls which address controls for building materials and offsite tracking of sediment.
   ii. Turbidity prevention measures: Use methods for prevention of excess turbidity which include, but are not restricted to, intercepting ditches, settling ponds, gravel filter entrapment dikes, flocculating processes, recirculation, combinations thereof, or other approved methods that are not harmful to aquatic life.
PART 3: EXECUTION

3.1 GENERAL:

A. Furnish, install and maintain control measures necessary to prevent migration of sediments into the adjacent lake according to the approved Erosion, Sediment and Storm Water Control Plan. Contractor shall be solely responsible for risks related to the management of erosion control required by construction.

   1. Water discharged into surface waters shall contain least concentration of settleable material possible.

B. The Contractor shall install a turbidity barrier to protect open water prior to commencing with clearing and grubbing. Turbidity barrier shall meet the requirements of this Section.

3.2 INSTALLATION:

A. Turbidity Barrier Installation: Install the turbidity barrier so that it hangs freely in the water with the bottom of the curtain as flat on the bottom as possible. The bottom edge shall be weighted down sufficiently and with enough slack to prevent the curtain from rising off the bottom or becoming dislodged during wave or storm action. Fasten each end of the curtain firmly to the bank. There shall be enough slack and rope or cable to tighten or loosen as needed. Remove turbidity barrier upon approval by the Contracting Officer.

B. Silt Fence Installation: Extend silt fences a minimum of 16 inches above the ground surface without exceeding 34 inches above the ground surface. Provide filter fabric from a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are unavoidable, splice together filter fabric at a support post, with a minimum 6 inch overlap, and securely sealed. Excavate trench approximately 4 inches wide and 4 inches deep on the upslope side of the location of the silt fence. The 4 by 4 inch trench shall be backfilled and the soil compacted over the filter fabric. Remove silt fences upon approval by the Contracting Officer.

C. Installation of Other Erosion Control Devices: According to approved Erosion, Sediment and Storm Water Control Plan and manufacturer’s instructions.

3.3 FIELD QUALITY CONTROL:

A. Maintain temporary and permanent erosion and sediment control measures, and other protective measures in good and effective operating condition by performing routine inspections to determine condition and effectiveness and by repair of erosion and sediment control measures and other protective measures.

B. At least once a week, and after each storm event, the turbidity barrier and silt fences shall be inspected for damage and misplacement. Sections found torn, collapsed, undermined, or displaced shall immediately be repaired. Sections that are replaced shall be installed with overlaps as recommended by the manufacturer.

C. If sediment has deposited beyond the barriers, the sediment shall be removed immediately; additional measures shall be taken to prevent recurrence.

D. When sediment deposits have accumulated upstream to within three-quarters of the fill line of the silt fence, they shall be removed without damaging the fence. Dispose of sediment deposits off the National System of Public Lands at an approved facility.

END OF SECTION 01 57 13
SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 PRODUCT REQUIREMENTS

A. Quality Assurance:

1. Sources: To the fullest extent possible, provide products of the same kind, from a single source.

B. Product Delivery, Storage, and Handling:

1. Where manufacturers provide materials in unopened packaging; deliver materials to the project site in unopened packaging with contents, identification and shipping labels intact and legible.

2. Loose materials delivered to the project site shall be stamped or permanently marked as to type, dimension, model and serial numbers, and/or standards qualifications and other pertinent quality control and quality assurance markings applicable to the industry.

3. The Contractor shall be responsible for safe and secure storage of materials and equipment. Materials shall be stored to assure preservation of quality and fitness for the Work.

4. Deliver, store, handle and protect products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer’s written instructions.

C. Product Selection:

1. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.

2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.

3. Product Salient Characteristics: Unless otherwise specifically indicated, reference to any equipment, material, article or patented process, by trade name, make or catalog number shall be regarded as establishing a standard of quality and shall not be construed as limiting competition and the installation contractor may, subject to the approval of the Government, use any product, equipment, material, article or process which is equivalent to that named.

4. The Government shall be the sole judge of the quality and suitability of any proposed alternative equipment, material, article or process. The burden of proving quality and suitability of an alternative shall be upon the contractor. Any information required by the Government in judging an alternative shall be supplied by the contractor at no expense to the Government.

5. Where the use of an alternative material or process involves a redesign or changes to the work, the cost and time required to affect such approved changes by the Government shall be reimbursed by the Contractor.
D. Installation of Products:

1. Comply with Requirements and manufacturer’s instructions and recommendations for installation of products in the applications indicated.

2. Anchor each product securely in place, accurately located and aligned with other Work.

3. Clean exposed surfaces and maintain products free from damage and deterioration.

END OF SECTION 01 60 00
PART 1 - GENERAL

1.1 EXAMINATION AND PREPARATION

A. Examination:

1. Existing Conditions: The existence and location of site improvements and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.

2. Existing Utilities: The Government has no knowledge of underground utilities within the project site.

3. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

B. Preparation:

1. Existing Utility Information: Refer to Section - SUMMARY

2. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.


C. Construction Layout:

1. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing control points/benchmarks. If discrepancies are discovered, notify Contracting Officer promptly.

2. Site Improvements: Locate and lay out site improvements, including grading, fill and surface course, retaining walls, sheet piles, concrete slabs, fences and gates. The Government will not perform construction staking.

1.2 EXECUTION

A. Installation:

1. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

2. Comply with manufacturer’s written instructions and recommendations for installing products in applications indicated.
3. Install products at the time and under conditions that will ensure the best possible results.

4. Maintain conditions required for product performance until Substantial Completion.

5. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

6. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

7. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

8. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.

9. Joints: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

10. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

B. Correction of Work:

1. Repair or remove and replace defective construction. Do not initiate repair of damage to new or existing construction and equipment resulting from construction procedures, prior to notification of Contracting Officer. Restore damaged substrates and finishes.

1.3 CLEANING AND WASTE MANAGEMENT

A. Progress Cleaning

1. General: Comply with safety standards for cleaning. Comply with product manufacturer’s cleaning instructions. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly.

2. Installed Work: Keep installed Work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed.

B. Maintenance for Site Cleaning

1. Clean project site and work areas daily, including common areas; maintain project site free of waste materials and debris throughout contract duration.

C. Construction Waste Management and Disposal


2. Comply with requirements of authorities having jurisdiction.

3. Collect waste from construction areas and elsewhere daily.

5. Enforce requirements strictly.

6. Do not hold materials more than seven (7) days during normal weather or three (3) days when temperature is expected to rise above 80 degrees Fahrenheit.

7. Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly.

8. Items or debris not designated as salvage by Government shall become property of Contractor. Disposal of materials off site by recycling or landfill disposal. Payment of required fees shall be Contractor’s responsibility.

9. Do not burn waste materials. Do not bury waste, debris or excess materials on Government property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Refer to SECTION 01 35 00 – SPECIAL PROCEDURES, SECTION 01 50 00 – TEMPORARY FACILITIES AND CONTROLS, and SECTION 01 57 13 – TEMPORARY EROSION AND SEDIMENT CONTROL.

D. Final Cleaning

1. In addition to the requirements described for Progress Cleaning, the following are applicable:

   a. Schedule a final cleaning to occur just prior to Final Inspection; include all Work Sites, products and areas.

      1) Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.

      2) Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.

      3) Rake grounds that are neither planted nor paved to a smooth, even-textured surface.

      4) Remove tools, construction equipment, machinery, and surplus material from Project site.

      5) Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.

      6) Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.

      7) Sweep concrete floors broom clean in unoccupied spaces.

      8) Remove labels that are not permanent.

      9) Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
Partner’s Point Seawall – Final BLM 08/18/15
Division 1 – General Requirements
Section 01 70 00 – Execution And Closeout Requirements

1.4 STARTING AND ADJUSTING

A. Adjust swing gates for proper operation including opening and closing and latching and locking in both the open and closed positions.

B. Adjust operating components for proper operation without binding.

C. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components, comply with qualification requirements described in SECTION 01 40 00 - QUALITY REQUIREMENTS.

1.5 PROTECTING INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Final Inspection.

1.6 CLOSEOUT PROCEDURES

A. Preliminary Closeout Procedures: Complete the following upon completion of construction:

2. Submit the following as a separate and single submittal with coversheet, label and project identifying information as required in SECTION 01 33 00 – SUBMITTAL PROCEDURES, 14 calendar days in advance of the scheduled on-site inspection date to the Contracting Officer:

   a. Finalize and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs, below grade construction photographs, damage or settlement surveys.

   b. Complete adjustment of gates.

1. Once all construction is complete, perform a thorough review of all required Work in the presence of the Contracting Officer or delegated Contracting Officer’s Representative.

2. Prepare a list of any remaining items to be completed and corrected (Contractor’s Completion and Correction List); indicate the monetary contract value of items on the list, and reasons why the Work is not complete.

3. Advise Contracting Officer of pending insurance changeover requirements.

4. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
5. Obtain and submit releases permitting Government unrestricted use of the Work


7. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.

8. Submit changeover information related to Government use, operation, and maintenance.

9. Complete final cleaning requirements, including touchup painting.

10. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Final Inspection Procedures: Before requesting Final Inspection for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment.

2. Submit certified copy of Completion and Correction List, endorsed and dated by Contracting Officer. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.

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

C. Final Inspection Request

1. Submit a written request for final inspection for acceptance. List tasks from Preliminary Closeout and Final Inspection Procedures that are incomplete in the request.

2. On receipt of request, Contracting Officer will either proceed with inspection or notify Contractor of unfulfilled requirements. Unless otherwise approved by the Contracting Officer, require superintendent to be present during final inspection when this Work is included in the Contract. Contracting Officer will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

   a. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.7 CLOSEOUT SUBMITTALS

A. Completion and Correction List

1. Submit Work Completion and Correction List prior to Final Inspection.

2. Preparation: Submit one (1) copy of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

B. Warranties
1. Materials and equipment furnished under this Contract shall be covered by the most-favorable commercial warranties Contractor provides to any customer for such materials. Rights or remedies provided shall be in addition to, and not limit, any rights afforded to Government by any other clause of this Contract. With respect to all warranties, expressed or implied, from manufacturers or suppliers for materials furnished under the Contract, Contractor shall:
   a. Obtain warranties that would be given in normal, commercial practices.
   b. Require warranties to be executed, in writing, for the benefit of the Government.
   c. Submit warranties to Contracting Officer, prior to the final inspection.

2. Submittal Time: Submit written warranties on request of Contracting Officer for designated portions of the Work where commencement of warranties other than date of Final Inspection is indicated.

3. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

4. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.

5. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.

6. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

C. Project Record Documents: (As-Built notations and markings applied to Contract Documents)

1. Project Record Drawings
   a. Record Prints: Maintain a clean and complete set of full-sized blue- or black-line white prints, of the Contract Drawings as furnished by the Contracting Officer and Shop Drawings.
      1) Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
      2) Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
      3) Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
   b. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
   c. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
d. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

2. Record Transparencies: Immediately before inspection for Certificate of Substantial Completion, review marked-up Record Prints with Project Engineer. When authorized, prepare a full set of corrected transparencies of the Contract Drawings and Shop Drawings.
   
a. Incorporate changes and additional information previously marked on Record Prints. Erase, redraw, and add details and notations where applicable.

b. Refer instances of uncertainty to Contracting Officer for resolution.

c. Contracting Officer will furnish Contractor one set of transparencies of the Contract Drawings for use in recording information.

d. Print the Contract Drawings and Shop Drawings for use as Record Transparencies. Architect will make the Contract Drawings available to Contractor's print shop.

3. Record CAD Drawings: Immediately before inspection for Certificate of Substantial Completion, review marked-up Record Prints with Contracting Officer. When authorized, prepare a full set of corrected CAD Drawings of the Contract Drawings, as follows:
   
a. Format: Same CAD program, version, and operating system as the original Contract Drawings.

b. Incorporate changes and additional information previously marked on Record Prints. Delete, redraw, and add details and notations where applicable.

c. Refer instances of uncertainty to Contracting Officer for resolution.

d. Contracting Officer will furnish Contractor one set of CAD Drawings of the Contract Drawings for use in recording information.
   
   1) Contracting Officer makes no representations as to the accuracy or completeness of CAD Drawings as they relate to the Contract Drawings.

   2) CAD Software Program: The Contract Drawings are available in AutoCad 2013.

4. Record Drawing Submittal Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
   
a. Record Prints: Organize Record Prints and newly prepared Record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.

b. Record Transparencies: Organize into unbound sets matching Record Prints. Place transparencies in durable drawing tube containers with end caps. Mark end cap of each container with identification. If tube does not include complete set, identify contents.

c. Record CAD Drawings: Organize CAD information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each CAD file.

d. Identification: As follows:
1) Project name.

2) Date.

3) Designation "PROJECT RECORD DRAWINGS."

4) Name of Architect.

5) Name of Contractor.

5. Record Specifications

a. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1) Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.

2) Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.

3) Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.

4) Provide notations to correlate with related Change Orders, Record Product Data, and Record Drawings where applicable.

6. Record Product Data

a. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1) Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.

2) Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.

3) Provide notations to correlate with related Change Orders, Record Specifications, and Record Drawings where applicable.

7. Record Photographs: Include construction photographs per SECTION 01 30 00 – ADMINISTRATIVE REQUIREMENTS, Paragraph – Construction Progress Documentation.

8. Record Miscellaneous Data

a. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
D. Sustainable Design and Closeout Documentation

1. Submit Contractor’s documentation of Sustainability efforts accomplished during progress of the Work per SECTION 01 80 00 – PERFORMANCE REQUIREMENTS. Incorporate sustainability documentation with Project Record Documents Submittal.

PART 2 - PRODUCTS

2.1 CLEANING PRODUCTS

A. Use only cleaning products specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

B. Refer to SECTION 01 80 00 – PERFORMANCE REQUIREMENTS where product manufacturer’s will allow alternative cleaning materials.

PART 3 - EXECUTION

3.1 RECORDING, MAINTAINING AND SUBMITTING PROJECT RECORD DOCUMENTS

A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.

B. Maintenance of Record Documents and Samples: Store Record Documents and Samples apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Contracting Officer's reference during normal working hours.

C. Installation Changes: Maintain records, by contractor of actual installations where at variance with work shown, where changed, or where not otherwise located by dimension, elevation or other reference on Drawings. Record actual locations and elevations of equipment and components (such as pipe, conduits and ducts) occurring within concealed areas by actual dimensions referenced from readily accessible and permanent building lines or monuments.

D. Submittals for Review: Submit record drawings to Contracting Officer for review prior to the final inspection. Should the final inspection reveal changes in the project not so noted on the record drawings, the Contractor shall record these changes on the record drawings within 5 working days of final inspection.

E. Submittals for Record: Submit the completed record drawings to the Contracting Officer within 5 working days of the final inspection. Submit completed Submittals Log and Final Schedule of Values.

END OF SECTION 01 70 00
PART 1 - GENERAL

1.1 FACILITY PERFORMANCE REQUIREMENTS

A. Sustainable Design Requirements: Sustainability and Reduce, Reuse, Recycle: support implementation of federal policy and programs for sustainable building, in accordance with EO13423, EO13514, and Guiding Principles for Federal Leadership in High Performance and Sustainable Building as per the Memorandum of Understanding updated December 2008.

B. Definitions Pertaining to Sustainable Development: Terminology is defined in ASTM E2114 and as specified herein:

1. Biobased Materials: As defined in the Farm Security and Rural Investment Act, for purposes of Federal procurement of biobased products, “biobased” means a “commercial or industrial product (other than food or feed) that is composed, in whole or in significant part, of biological products or renewable domestic agricultural materials (including plant, animal, and marine materials) or forestry materials.” Biobased materials also include fuels, chemicals, building materials, or electric power or heat produced from biomass as defined by The Biomass Research and Development Act of 2000.

2. Biobased content: The amount of biobased carbon in the material or product as a percentage of weight (mass) of the total organic carbon in the material or product.


4. DfE (Design for the Environment): A technique that includes elements of resource conservation and pollution prevention as applied in various product sectors. A technique that incorporates approaches which are part of product (or assembly) concept, need and design. Considerations involve material selection, material and energy efficiency, reuse, maintainability and design for disassembly and recyclability.

5. Non-Renewable Resource: A resource that exists in a fixed amount that cannot be replenished on a human time scale. Non-renewable resources have the potential for renewal only by geological, physical, and chemical processes taking place over of millions of years. Examples include: iron ore, coal, and oil.

6. Perpetual Resource: A resource that is virtually inexhaustible on a human time scale. Examples include solar energy, tidal energy, and wind energy.

7. Recycled Content Materials: Products that contain pre-consumer or post-consumer materials as all or part of their feedstock. Recycled content claim shall be consistent with Federal Trade Commission (FTC) Guide for the Use of Environmental Marketing Claims.

8. Renewable resource: a resource that is grown, naturally replenished, or cleansed, at a rate which exceeds depletion of the usable supply of that resource.

9. Rapidly renewable material: Material made from plants that are typically harvested within a ten-year cycle.

10. Stewardship: Responsible use and management of resources in support of sustainability.

C. Sustainability Documentation Requirements: In accordance with federal efforts to reduce waste, the contractor shall document efforts related to recycling and waste reduction. Contractors shall provide products and services that include: alternatives to hazardous waste; bio-based products; non-ozone depleting substances; recycled products; and, environmentally preferable products as defined by the EPA. Preferred products and categories are listed on the EPA’s web-site:

http://www.epa.gov/epaoswer/non-hw/procure/backgrnd.htm

D. Sustainable Costing Requirements: In accordance with provided federal acquisition regulations, please consider the cost of using environmentally preferred products when quoting for this solicitation. For further clarification, please contact the Contracting Officer.

E. Federal Acquisition Regulations for Sustainability: Refer to FAR Clause: 52.223-17, Affirmative Procurement of EPA designated items in Service and Construction Contracts.

1.2 FACILITY SUBSTRUCTURE PERFORMANCE REQUIREMENTS

A. Foundation Performance Requirements: use recycled materials for proposed concrete foundations when recycled materials are provided from documentable/auditable commercial sources and use of recycled materials is supported through the structural loading analysis and design processes.

B. Seawall Performance Requirements: use recycled materials for proposed sheetpile when recycled materials are provided from documentable/auditable commercial sources and use of recycled materials is supported through the structural loading analysis and design processes.

1. Design Life: 30 Years, minimum

1.3 SITE CONSTRUCTION PERFORMANCE REQUIREMENTS

A. Site Preparation: minimize erosion and control sediment

B. Site Improvements: recycle deconstructed elements where accepting facilities are available. Include consideration for recycled materials in the cost proposal when consideration is also provided by the accepting facility.

C. Site Protection: Operate and stage vehicles and equipment within existing roadways and parking areas, within areas and along routes shown on the drawings, described in the specifications and/or as field-approved by the Contracting Officer.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 80 00
SECTION 02 20 00 – ASSESSMENT

PART 1 - GENERAL

1.1 SUMMARY

A. This Section contains information resulting from site investigations and assessments of the site conditions existing prior to design.

1.2 SITE SURVEYS

A. General: A site survey was completed by others during the design phase of this project. Project control points and/or benchmarks, topography with labeled contours, location and orientation of existing site improvements, location and orientation of proposed improvements and the layout data necessary for construction staking of proposed improvements are shown on the drawings.

1. The Government has no knowledge of the following within the project boundary:
   a. Road or utility or other easements;
   b. Land ownership in-holdings; or
   c. Subterranean structures or underground utilities

2. Basis of bearings and basis of elevations used for the site survey are indicated on the drawings.

3. Construction surveying and layout shall conform to Section 02 21 13 Site Survey.

1.3 ENVIRONMENTAL ASSESSMENT

A. General: BLM performed the site assessment for natural, historical and cultural resources. See attached National Environmental Policy Act (NEPA) documentation.

1. The Government has no knowledge of the following within the project boundary:
   a. Cemeteries or burial grounds;
   b. Historical or other Cultural objects;
   c. Threatened or Endangered Species.

1.4 HAZARDOUS MATERIALS ASSESSMENT

A. General: BLM performed a visual site assessment for hazardous materials.

1. The Government has no knowledge of the following within the project boundary:
   a. Hazardous materials.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 02 20 00
SECTION 02 21 13 – SITE SURVEYS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Performing surveying, staking, calculating, and recording data for the control of work. See FAR Clause 52.236-17 Layout of Work.
   2. Review existing site survey performed for design.

1.2 QUALIFICATIONS

A. Qualifications for firms and individuals performing Work described in this section shall be as described in Section 01 40 00 – QUALITY REQUIREMENTS.

B. Provide technically qualified survey crews experienced in construction survey and staking. Provide personnel capable of performing in a timely and accurate manner.

1.3 SUBMITTALS

A. Submit the following at the Preconstruction Conference:
   1. Include the following when Automated Machine Guidance (AMG) methods are used:
      a. Technology Statement. A written statement that includes
         1) Manufacturer, model, and software version of the AMG equipment; and
         2) Certification that the final 3D data is compatible with the AMG equipment.
      b. Personnel Qualifications
         1) Name, authority, relevant experience, and qualifications of the person with overall responsibility for the AMG system.
         2) Names, authority, and relevant experience of personnel directly responsible for operating the AMG equipment.
      c. Contractor Quality Control Plan. Comply with SECTION – QUALITY REQUIREMENTS and describe procedures for checking, mechanical calibration, and maintenance of both survey and construction equipment. Include the frequency and types of checks performed.
   2. Surveyor’s Qualifications.

B. Include a price breakdown by individual tasks when construction survey and staking is paid by the lump sum for use in making progress payments and price adjustments.

PART 2 - PRODUCTS

2.1 PERSONNEL

A. Provide a crew supervisor on the project whenever surveying and staking is in progress.
2.2 EQUIPMENT

A. Furnish survey instruments and supporting equipment capable of achieving the specified tolerances.

B. Construction equipment controlled with a Global Positioning System (GPS) and Robotic Total Station (RTS) machine guidance system may be used in the construction of subgrade, subbase and base courses or other construction operations when approved.

2.3 MATERIAL

A. Furnish acceptable tools and supplies of the type and quality suitable for the project conditions. Furnish stakes and hubs of sufficient length to provide a solid set in the ground with sufficient surface area above ground for necessary legible and durable markings.

PART 3 - EXECUTION

3.1 SURVEYING AND STAKING

A. GENERAL

1. Include staking activities in the Construction Schedule; include dates and sequence of each staking activity.

2. The Government will set control points and will provide data for use in establishing control for completion of Work. Horizontal and vertical data will be provided; reformatting and additional calculations may be required for the convenient use of the Government furnished data. Provide immediate notification of apparent errors in the initial staking or in the Government furnished data.

3. Record survey and measurement field data in an approved format. Submit as-staked data and corrections made to the Government furnished data. Submit survey and measurement data at least weekly.

4. Field data and supporting documentation become the property of the Government upon completion of the Work.

B. COORDINATION

1. Discuss and coordinate the following with the Contracting Officer before surveying and staking:
   a. Surveying and staking methods;
   b. Stake marking;
   c. Grade control for courses of materials;
   d. Referencing;
   e. Structure control;
   f. Field staking data;
   g. Localization of the GPS systems to the Government established control points; and
   h. Other procedures and controls necessary for the work.

2. Do not start Work until staking or three-dimensional (3D) verification data for the affected work has been approved.
3. Preserve initial reference and control points. Notify the Contracting Officer of missing control points immediately upon discovery. The Government will reestablish missing control points before the beginning of construction.

4. Acceptance of construction staking does not relieve the Contractor of responsibility for correcting errors discovered during the work and for bearing additional costs associated with the error.

5. Maintain legibility of stake markings for duration of the project or until notified in writing the stakes are no longer needed. Replace stakes if necessary to ensure markings are maintained.

6. Remove and dispose of flagging, paint, lath, stakes, and other staking material after the project is complete.

C. STAKING AND RESTAKING

1. Perform survey, staking, recording of data, and calculations as necessary to construct the project from initial layout to final completion. Survey and set stakes to the tolerances indicated in this section. Reset stakes; refine 3D data, or both as many times as necessary to construct the Work.

   a. Control Points. Relocate initial horizontal and vertical control points in conflict with construction to areas that will not be disturbed by construction operations. Furnish the coordinates, elevations, and supporting documentation for the relocated points before the initial points are disturbed. Set durable monuments for survey control that uniquely identifies the points.
      
      1) Furnish the GPS localization results at least seven (7) calendar days before beginning construction layout survey work. The Contracting Officer may order the GPS localization calibration and associated 3D model to be broken into two or more zones to maintain the localized relationship between control points and original ground.

   b. Centerline establishment. Establish a project centerline as necessary to construct the Work. Reestablish the project centerline when construction survey and staking work does not meet the tolerances.

   c. Slope and references stakes. Perform the following:
      
      1) Conventional survey method
         
         a) Verify and set slope stakes on both sides of centerline at the theoretical catch point. If the theoretical catch point is not within a tolerance of 0.5 feet, perform original ground topographic verification according to Subsection 152.05(c). Set the slope stake at the actual intersection of the design slope with the natural ground-line. Set reference stakes outside the clearing limits. Include reference points and slope-stake information on the reference stakes.

         b) Establish slope stakes in the field as the actual point of intersection of the design slope with the natural ground-line when theoretical catch point information is not available.

   d. Clearing and grubbing limits. Set clearing and grubbing limits on both sides of centerline based on the actual slope-stake locations.

   e. Grade-finishing stakes.
      
      1) Conventional survey methods.
         
         a) Set grade-finishing stakes for grade elevations and horizontal alignment, on centerline and on each shoulder at design cross-section locations. Set stakes at the
top of subgrade and the top of each aggregate course. Reset grade finishing stakes as many times as necessary to construct the subgrade and each aggregate course.

b) Use brushes or guard stakes at each stake.

D. DREDGING SURVEY

a. Survey for dredging quantities and acceptance shall conform to Section 31 23 00 EXCAVATION AND FILL

END OF SECTION 02 21 13
PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Demolition and removal of select site elements.

2. Salvage of existing items to be recycled.

3. Salvage of existing items to be reused in the work.

1.2 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and recycled.

B. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.3 SUBMITTALS

A. Schedule of Selective Demolition Activities: Indicate detailed sequence of selective demolition and removal work, with starting and ending dates for each activity, interruption of utility services, and means of egress.

B. Pre-demolition Photographs or Videotapes: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by selective demolition operations. Comply with photographic documentation requirements described in Division 1 Section "Construction Progress Documentation." Submit before Work begins.

C. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

   1. Comply with submittal requirements in Section “Submittal Procedures” and additional requirements described in Sections "Special Procedures" and “Temporary Facilities and Controls”.

1.4 QUALITY ASSURANCE

A. Demolition Firm Qualifications: An experienced entity specializing in demolition work similar in material and extent to that indicated for this Project.

B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

D. Pre-demolition Conference: Conduct conference at Project site.

1.5 PROJECT CONDITIONS

A. Government will occupy buildings immediately adjacent to selective demolition area. Conduct selective demolition so Government operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Government as far as practical.

C. Notify Contracting Officer of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
   1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Contracting Officer.

1.6 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

B. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

C. When unanticipated elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Contracting Officer.

D. Survey of Existing Conditions: Record existing conditions by use of measured drawings, preconstruction photographs, preconstruction videotapes or templates.
   1. Comply with requirements specified in Division 1 Section 01 32 00, CONSTRUCTION PROGRESS DOCUMENTATION.

E. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.2 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
1. Comply with requirements for access and protection specified in Division 1 Section "Temporary Facilities and Controls."

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

3.3 SELECTIVE DEMOLITION

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Dispose of demolished items and materials promptly. Comply with requirements in Division 1 Section 01 70 00 - EXECUTION AND CLOSEOUT REQUIREMENTS.

B. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Contracting Officer, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

C. Chain-link Fencing: Temporarily remove enough chain-link fencing to prevent damage during demolition and construction work. Carefully remove the connections holding the chain-link to the posts. Roll back enough fencing to permit adequate access for clearing, grubbing, selective site demolition and construction. Completely remove the posts and remove the concrete footing from around the post. Recycle the posts. Recycle the concrete. When construction has been completed, reinstall new fence posts with new fasteners and accessories, as shown on the drawings and described in the specifications.

1. Schedule removal of fencing to maintain a secure enclosure around work area.

D. Items for Select Demolition and Removal for Disposal to landfill.

1. Chain link fence posts with concrete.

2. Portions of floating dock not recyclable.

E. Items for Salvage and Removal for Disposal by Recycling.

1. Portions of floating dock for which there are local accepting facilities.

2. Chain link fence posts without concrete.

3. Chain link fence fabric, fittings, fasteners and accessories.

F. Items for Salvage and Reuse in the Work.

1. River Rock
G. Items for Salvage and Return to the Contracting Officer.
   1. Steel Bollards

3.4 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be recycled or otherwise indicated to remain Government property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
   1. Comply with requirements specified in Division 1 Section - EXECUTION AND CLOSEOUT REQUIREMENTS.

B. Burning: Do not burn demolished materials.

C. Disposal: Demolished items designated for disposal by landfill or recycling shall be transported off the BLM National System of Public Lands in accordance with Federal, State and Local regulations regarding construction waste.

3.5 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

B. Do not discharge volatile, harmful, or dangerous materials into drainage systems.

END OF SECTION 02 41 13
SECTION 03 30 00 – CAST-IN-PLACE CONCRETE

SECTION 03 31 00 - STRUCTURAL CONCRETE

PART 1:  GENERAL

1.1  SUMMARY

A. Section Includes: Furnish labor, materials and equipment for placement of cast-in-place concrete for fence post and gate post footings, retaining walls, deck slab and concrete anchors for seawall, including reinforcing steel, formwork, and sub-base.

1.2  SUBMITTALS

A. Requirements: Submittals shall be according to Section - Submittal Procedures.

B. Manufacturer's Literature: Submit for approval three copies of the manufacturer's descriptive data for any admixtures to be used on this project in the concrete design mix, include the brand names and descriptions and batch tickets when delivered on site.

C. Mix Design: Submit for approval three copies of the design mix and strength test results for each strength, class and type of concrete to be used on this project. Mix designs and strength test results shall be prepared by a certified testing laboratory.

D. Certificates of Conformance:

1. Submit three copies of the batch certificates for each load of ready-mix delivered to the jobsite, certifying that the batch conforms to the requirements of this specification.

2. Submit three copies of the required test results for for each load of ready-mix delivered to the jobsite, certifying that water used in the batch that was not sourced from a Public Water System conforms to the requirements of this specification.

E. Certificates of Compliance:

1. Submit three copies of the materials certificates, test data certifying steel reinforcement is in compliance with these specifications.

2. Submit three copies of the materials certificates, test data certifying membrane curing compound is in compliance with these specifications.

F. Certificate of Conformance: indicate Public Water System source or provide test results for water used in concrete mix that is sourced from other than Public Water Systems.

1.3  QUALITY ASSURANCE

A. Causes for Rejection of Concrete include, but are not limited to:

1. Inadequate strength after 28 calendar days as indicated by test cylinders.

2. Freezing during the curing period.
3. Segregation of aggregate or over-vibration resulting in excessive water in the surface of the concrete or lack of water in vertical surfaces.

4. Honeycomb over 25 percent of the surface.

5. Voids larger than 2-inches across.


7. Misalignment of concrete structure.

8. Substandard aggregate in the mix.

9. Failure to cover or seal concrete during initial 7-day curing period.

10. Improper placement of cut-offs, blockouts, anchor bolts, or other imbedded items.

11. Irregular, cracked, crazed, or spalled concrete surfaces.

B. No extra water shall be added to the mix as batched from the plant, either en-route or at the site. Strict adherence for water cement ratio shall be complied with for concrete.

PART 2: PRODUCTS

2.1 MATERIALS

A. Portland cement concrete shall consist of a mixture of hydraulic cement, fine aggregate, coarse aggregate, and water. The concrete mixture shall be designed to be resistant to moderate sulfate conditions. It may also contain air-entraining admixtures, chemical admixtures, and a supplementary cementitious material. The contractor shall determine the mix proportions and shall furnish concrete which conforms to the requirements of these specifications. All concrete shall be sufficiently workable, at the slump proposed by the contractor within the specified range, to allow proper placement of the concrete without harmful segregation, bleeding, or incomplete consolidation. It shall be the responsibility of the contractor to proportion, mix, place, finish and cure the concrete properly in accordance with the requirements of these specifications.

B. Hydraulic Cement:

1. Hydraulic cement shall consist of either Portland cement or Portland-pozzolan cement.

2. Portland cement shall conform to the requirements of ASTM C 150 for Type II, III, or V. However, at the option of the manufacturer, processing additions may be used in the manufacture of the cement, provided such processing additions have been shown to meet the requirements of ASTM C 465, and the total amount of such material used does not exceed one percent of the weight of the Portland cement clinker.

3. Portland-pozzolan cement shall conform to the requirements of ASTM C 595 for Type IP (MS).

4. Hydraulic cement shall not contain more than 0.60 percent total alkali. The word alkali as used in these specifications shall be taken as the sum of sodium oxide and potassium oxide calculated as sodium oxide.
5. Cement of different types or brands shall not be intermingled or used in the same batch.

6. The contractor shall provide suitable means for storing and protecting the cement against dampness. Cement which for any reason has become partially set or which contains caked lumps shall not be used.

7. The use of either sacked cement or bulk cement is permissible. The use of fractional bags of sacked cement will not be permitted unless the contractor elects to weigh the cement into each batch.

8. Supplementary Cementitious material (Fly Ash, Natural Pozzolan, and Silica Fume)
   a) Supplementary cementitious materials shall be approved prior to their use by the Contracting Officer.
   b) Fly ash and natural pozzolan shall conform to the requirements of ASTM C 618 for Class C, F, or N mineral admixture, except that the loss on ignition shall not exceed 3.0 percent.
   c) Silica fume shall conform to the requirements of ASTM C 1240.
   d) When a supplementary cementitious material with calcium oxide content greater than 15 percent is used, or when sulfate resistant concrete is specified, the cement intended to be used shall be tested for sulfate expansion in accordance with ASTM C 1157 and ASTM C 1012. For moderate sulfate resistance, the maximum expansion shall be 0.10 percent at six months. For high sulfate resistance, the maximum expansion shall be 0.05 percent at six months and 0.10 percent at one year.
   e) When Class C fly ash is used, the cement intended to be used shall be tested for sulfate expansion in accordance with ASTM C 1157 and ASTM C 1012 and shall have a maximum expansion of 0.05 percent at six months and 0.10 percent at one year.

C. Water:
1. Water shall be sampled and tested in accordance with the requirements of AASHTO T 26.
2. Water shall be clean and free from harmful amounts of acids, alkalis, and organic materials.
3. Water shall not contain more than 1,000 parts per million of chlorides as Cl or of sulfates as SO4.
4. Potable water obtained from Public utility distribution lines is acceptable without testing.
5. Additional water other than that specified in the approved mix design, either at the plant, in route or at the site shall not be allowed.
6. Water obtained from Lake Havasu may not be used for concrete mixtures without meeting all other quality requirements.

D. Aggregates
1. General:
   a. When aggregates show potential for alkali silica reaction (ASR), as indicated by expansions of 0.10 percent or greater at 16 days after casting when tested in accordance with ASTM C 1260, sufficient
mitigation for the expansion shall be determined in accordance with ASTM C 1567.

b. Mill tailings or material from mine dumps shall not be used in the production of fine or coarse aggregate.

c. The following test methods will be used to evaluate the quality of aggregates for concrete:

<table>
<thead>
<tr>
<th>Test</th>
<th>Method</th>
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<tbody>
<tr>
<td>Sampling</td>
<td>Arizona Test method 105f</td>
</tr>
<tr>
<td>Reducing field samples to testing size</td>
<td>AASHTO T248</td>
</tr>
<tr>
<td>Potential for Alkali Silica Reaction</td>
<td>ASTM C 1260 and ASTM C 1567</td>
</tr>
<tr>
<td>Clay lumps and friable particles</td>
<td>AASHTO T112</td>
</tr>
<tr>
<td>Coal, lignite and lightweight particles</td>
<td>AASHTO T113</td>
</tr>
<tr>
<td>Organic impurities</td>
<td>AASHTO T21</td>
</tr>
<tr>
<td>Aggregate gradation</td>
<td>Arizona Test method 201c</td>
</tr>
<tr>
<td>Soundness (Sodium Sulfate)</td>
<td>AASHTO T104</td>
</tr>
<tr>
<td>Mortar strength</td>
<td>AASHTO T71</td>
</tr>
<tr>
<td>Sand equivalent</td>
<td>ASTM D 2419</td>
</tr>
<tr>
<td>Los Angeles abrasion</td>
<td>ASTM C 131</td>
</tr>
<tr>
<td>Fractured coarse aggregate particles</td>
<td>Arizona Test method 212e</td>
</tr>
<tr>
<td>Specific gravity and absorption of coarse aggregate</td>
<td>Arizona Test method 210b</td>
</tr>
<tr>
<td>Specific gravity and absorption of fine aggregates</td>
<td>Arizona Test method 211d</td>
</tr>
</tbody>
</table>

d. Arizona Test Methods may be obtained from the ADOT website at: http://azdot.gov/business/engineering-and-construction/MaterialsGroup/materials-manuals

2. Coarse:

a. Coarse aggregate shall conform to the applicable requirements of ASTM C 33 and shall be, hard, durable, uncoated crushed stone or gravel. Cinders will not be allowed. The aggregate shall be free of clay and shall be washed.
b. Coarse aggregate grading requirements shall conform to the appropriate rock size designation in the Grading Requirements for Coarse Aggregate, Table 2.

c. The loss by abrasion in the Los Angeles Abrasion Machine, determined as prescribed in ASTM C131, shall not exceed 10 percent, by weight, after 100 revolutions nor 40 percent after 500 revolutions.

d. Prior to the delivery of the aggregates and whenever required during concrete production, the Contractor shall make stockpiles available for testing. All required samples shall be furnished at the expense of the Contractor.

e. Reclaimed Concrete Materials (RCM) and Reclaimed Asphalt Pavement (RAP) shall not be allowed in Portland Cement Concrete mixtures.

f. The amount of deleterious substances in washed coarse aggregate shall not exceed the following limits by dry weight:

1) Clay lumps shall not exceed 0.25 percent

2) Coal and lignite shall not exceed 0.25 percent

3) Material passing the #200 sieve shall not exceed 0.50 percent unless the coarse material is 100 percent crushed aggregate the limit shall be 1.00 percent

4) Shale and other materials having a specific gravity less than 1.95 shall not exceed 1.00 percent

3. Fine:

a. Fine aggregate shall conform to the applicable requirements of ASTM C 33 and shall be clean, hard, durable, washed and uncoated sand grains, free from silt, loam and clay with a fineness modulus of not less than 2.5 or more than 3.0.

b. Fine aggregate grading requirements shall conform to the Fine Aggregate Grading section.

c. Fine aggregate shall have a sand equivalent value not less than 75 when tested in accordance with ASTM D 2419.

d. The amount of deleterious substances in washed fine aggregate shall not exceed the following limits by dry weight:

1) Clay lumps shall not exceed 0.50 percent

2) Coal and lignite shall not exceed 0.25 percent

3) Shale and other materials having a specific gravity less than 1.95 shall not exceed 1.00 percent

E. Reinforcing Steel: Reinforcing steel shall be furnished in the sizes, shapes, and lengths shown on the plans and in conformance with the requirements of this Section. When reinforcing steel is delivered to the site of the work, the contractor shall furnish copies of all shipping documents. Each shipping document shall show the sizes, lengths and weights of the reinforcing steel separately for each structure.
1. Reinforcing Bars: Except when used for wire ties or spirals, steel bars used as reinforcement in concrete shall be deformed and shall conform to the requirements of ASTM A 615 Grade 60.

2. Wire: Steel wire used as spirals or ties for reinforcement in concrete shall conform to the requirements of AASHTO M 32.


F. Membrane Curing Compound:

1. Liquid membrane forming compound shall conform to the requirements of AASHTO M 148; a Type 2 compound with either a Class A or Class B vehicle shall be used for concrete pavement, bridge decks, and approach slabs. Type 1-D compound with either a Class A or Class B vehicle shall be used for other concrete items.

G. Moist Curing Material


H. Admixtures: Other than specified herein, or by reference, admixtures may be used only when approved in writing by the Contracting Officer. When used, comply with the manufacturer's written instructions.

1. Air content by volume: ACI 211.1, paragraph 6.3.3, 4 percent plus or minus 1 percent. Air entrainment additives: ASTM C 260.

2. Calcium chloride as a separate admixture shall not be acceptable.

3. Water reducing or retarding chemical admixtures: ASTM C 494. Used only when specified in the mix design or approved by the Contracting Officer.

4. Dust preventative agents: Fluorosilicate solutions, 2 pounds (1 kg) of magnesium fluorosilicate per 1 gallon (4 liters) of water, or 2 pounds (1 kg) of zinc fluorosilicate-crystalline salts per 1 gallon (4 liters) of water, shall be used when approved in writing by the Contracting Officer.

5. Surface hardener: Natural aggregate or iron-bearing dry-shake material for concrete surface improving and hardening, manufactured for this purpose, containing quartz, trap-rock, emery, or granite, and approved in writing by the Contracting Officer.

6. The contractor shall furnish Certificates of Compliance for each type of admixture furnished.

7. If more than one admixture is used, the admixtures shall be compatible with each other so that the desired effects of all admixtures used will be realized.

J. Vapor Barriers: Not required for this project. Completely wet the placement surface with water to slow ground absorption of concrete water during hot weather (above 85º Fahrenheit).
K. Control Joints: Space as shown on the drawings.

L. Expansion Joint Filler: Filler shall be 1/2" thick and shall meet the requirements of ASTM D 1751 for bituminous type or ASTM D 1752 or ASTM D 2628 for non-bituminous type. Where required or shown on the drawings a non-impregnated compressible foam backer rod shall be installed in the expansion joint prior to applying joint sealer. The backer rod shall be 1/8 inch larger in diameter than the joint width and shall be placed in the joint so as to provide a clear depth above the backer rod from the finished concrete surface equal to 1/2 the joint width.

M. Epoxy Bonding Material: ACI 503.1 for hardened concrete or ACI 503.2 for plastic concrete.

N. Forming Material
   1. Formwork for concrete surfaces shall be straight and true lumber, plywood, or metal-framed materials to provide continuous, straight, smooth, as-cast surfaces. Furnish formwork in largest practicable lengths to minimize the number of joints. Form material shall be of sufficient stiffness to withstand pressure of newly placed concrete without bowing or deflection and sufficiently staked in place.

O. Epoxy Resin
   1. Epoxy resins for use in repairs shall conform to ASTM C881/C881M, Type V, Grade I or II.

P. Dock Fenders
   1. Dock bumpers shall be of a non-marring material composition (EPDM rubber or vinyl), and design that will not warp or crack due to temperature or UV rays and will be unaffected by gasoline, oil and fresh or salt water. Bumpers shall have Durometer rating between 70 – 80.

   2. Dock bumpers shall be 2” minimum thickness, 4” minimum width side-wall mounting type. Color shall be approved by the Contracting Officer. Corner bumpers shall also be provided.

Q. Dock Mooring Cleats: product shall be as noted on the drawings.

2.2 MIXES

A. Concrete Design Mix: Design the mix to provide Sulfate-resistant concrete, including specified admixtures and cement, with the following properties using material the Contractor proposes to use on the project:

   1. Class AA concrete shall meet the following requirements:
      
      | Property                        | Requirement                 |
      |--------------------------------|-----------------------------|
      | 28-day compressive strength    | 4,000 psi (minimum)         |
      | Cement content                | 600 pounds per cubic yard  |
      | Water / Cement ratio          | 0.45 (maximum)              |
      | Air content                   | between 4.0 - 6.0 percent   |
      | Coarse aggregate size         | 3/4 inch minimum            |
2. Class A concrete shall meet the following requirements:

- 28-day compressive strength: 3,000 psi (minimum)
- Cement content: 520 pounds per cubic yard (minimum)
- Water / Cement ratio: 0.45 (maximum)
- Air content: between 4.0 - 6.0 percent at the point of placement
- Coarse aggregate size: 3/4 inch minimum

3. Class B concrete shall meet the following requirements:

- 28-day compressive strength: 2,500 psi (minimum)
- Water / Cement ratio: 0.55 (maximum)
- Air content: air entrainment not required
- Coarse aggregate size: 3/4 inch

B. Unless otherwise specified or permitted, concrete shall have, at the point of delivery, a slump of 4 inches (plus or minus 1 - 1/2 inches). The maximum slump may be increased to 8 in. when high-range water reducing admixture is used and 6 in. when mid-range water reducing admixture is used. Concrete at the proposed slump shall be sufficiently workable to allow proper placement without harmful segregation, bleeding, or incomplete consolidation.

C. Concrete to be placed under water, tremie concrete, shall conform to the requirements for the class and strength required except the minimum cement content shall be increased by 50 pounds per cubic yard of concrete.

D. A supplementary cementitious material (fly ash, natural pozzolan, or silica fume) conforming to the requirements above may be used at the option of the contractor only when Portland cement is used. The use of a supplementary cementitious material is not allowed for replacement of cement when Portland-pozzolan cement is used. A maximum of 25 percent of the required weight of Portland cement may be replaced with fly ash or natural pozzolan. A maximum of 10 percent of the required weight of Portland cement may be replaced with silica fume, or a maximum of 10 percent silica fume may be added to the required weight of Portland cement. When supplementary cementitious material is used as a replacement for Portland cement, the replacement shall be made on a 1.0 pound to 1.0 pound basis. If performance enhancement of the concrete, such as the mitigation of an alkali silica reaction or for increased sulfate resistance is necessary, additional quantities of fly ash or natural pozzolan may be incorporated into the concrete without a corresponding Portland cement replacement.

E. Ready-mixed concrete that meets the above specifications will be permitted when approved in writing by the Contracting Officer. The Contracting Officer will have access to the mixing plant during concrete mixing operations. Site mixing will not be allowed for structural concrete.
PART 3: EXECUTION

3.1 PREPARATION

A. Clearing and Grubbing: Remove all surface rock, vegetation and other substances that may impair the placement of concrete.

B. Aggregate Sub-base: Shall be placed under the footings and slabs, as shown on the drawings, prior to erecting formwork. Sub-base shall be mechanically compacted to 95 percent and tested for compaction by a certified testing company.

C. Subgrade: Each subgrade upon which concrete or aggregate base course material are placed shall be firm and free from water. Subgrade shall be scarified to a depth of 8 inches and mechanically compacted to 95 percent and tested for compaction by a certified testing company. Water shall be kept several inches below subgrade until the concrete has set. When the subgrade is in dry earth, it shall be moistened with water from a spray nozzle immediately before concrete is placed.

D. Forms:

1. Forms shall be of suitable material and of type, size, shape, quality, and strength to enable construction as designed. The forms shall be true to line and grade, mortar tight, and sufficiently rigid to resist any appreciable amount of springing out of shape during placing of the concrete. All dirt, chips, sawdust, nails, and other foreign matter shall be completely removed from forms before any concrete is deposited. The surfaces of forms shall be smooth and free from irregularities, dents, sags and holes that would appreciably deface the finished surface. Forms previously used shall be thoroughly cleaned of all dirt, mortar and foreign matter before being reused, and the reuse of forms shall be subject to the approval of the Engineer. Before concrete is placed in forms, all inside surfaces of the forms shall be thoroughly treated with an approved releasing agent that will leave no objectionable film on the surface of the forms that can be absorbed by the concrete. Care shall be exercised that no releasing agent is deposited on previously placed concrete.

2. Forms for all surfaces that will not be completely enclosed or hidden below the permanent surface of the ground shall be made of surfaced lumber, or material which will provide a surface at least equally satisfactory. Any lumber or material which becomes badly checked or warped prior to placing concrete may be rejected.

3. Unless otherwise shown on the plans, all sharp edges shall be chamfered with 3/4 inch triangular fillets.

4. Form Inspection: Notify the Contracting Officer 24 hours in advance of concrete placement to allow for inspection of the formwork and placement of items to be placed in the concrete.

E. Construction Joints: Shall be made at locations as approved by the Contracting Officer or as indicated on the drawings. Reinforcing steel shall be continuous through joints or as shown on the drawings.

F. Reinforcing Steel:

1. Reinforcing bars shall be accurately placed as shown on the plans and shall be firmly and securely held in position by wiring at intersections with wire not smaller than No. 16 gage and by using concrete or metal chairs, spacers, metal hangers, supporting wires and other approved devices of sufficient strength to resist crushing under full load. Wooden supports shall not be used. Placing bars on layers of fresh concrete as the work progresses and adjusting bars during the placing of concrete will not be permitted.
2. Before placing in the forms, all reinforcing steel shall be thoroughly cleaned of mortar, oil, dirt, loose mill scale, loose or thick rust and coatings of any character that would destroy or reduce the bond.

3. No concrete shall be deposited until the placing of the reinforcing steel has been inspected and approved.

4. Bundle bars shall be tied together at not more than 6 feet on-center.

5. The Contractor will be allowed the following tolerances when placing, tying and supporting reinforcing steel:
   
a. In slabs, footings and beams, horizontal bars shall be within ¼ inch measured vertically, of the position indicated on the plans.
   
b. In vertical walls, columns, wings, and similar members, clearance from the forms shall be within ¼ inch of the clearance shown on the plans.
   
c. In slabs or walls, long runs of bars may vary up to 2 inches in spacing; however, the specified number of bars shall be placed.

6. Splices of bars shall be made only where shown on the plans or as approved by the Engineer. Where bars are spliced they shall be lapped at least 30 diameters, unless otherwise shown on the plans.

7. Welding of reinforcing steel will not be permitted unless specifically authorized by the Engineer.

8. Bending of reinforcing steel shall conform to the requirements of the AASHTO LRFD Bridge Construction Specifications Section 9.4. Bars shall not be bent nor straightened in a manner that will injure the material. Bars with kinks or unspecified bends shall not be used.

G. Vapor Barrier: There are no requirements for this item.

H. Concrete Mixing: ACI 304.

1. Concrete shall not be mixed on site.

2. When using ready-mixed concrete, comply with the requirements of ASTM C 94 and as herein specified. During hot weather or under conditions contributing to rapid setting of concrete, a shorter mixing time than is specified in ASTM C 94 may be required. When air temperature is between 85 and 90 degrees F, reduce the mixing and delivery time from 90 to 75 minutes. When air temperature is above 90 degrees F, reduce the mixing and delivery time to 60 min. The 60 min. mixing and delivery time shall commence the time the mix leaves the plant to complete placement at the site. At higher temperatures when concrete cannot be placed within specified time frames the use of retardants or smaller pours may be allowed. Do not place concrete when each delivery truck of concrete cannot be poured in the specified time, from start of pour to finish. Concrete must be in-place within the specified time frame. Concrete which exceeds the specified time for mixing and delivery may be rejected, especially if it shows evidence of setting up as it is poured.

3. Each batch of concrete shall be mixed for not less than 70 and not more than 100 revolutions of the drum at mixing speed after all materials been loaded into the drum. Any revolving of the drum beyond the maximum number of revolutions shall be at the agitating speed. Mixing shall begin within 10 minutes after the cement has been combined with either the aggregate or water.
4. Bodies of non-agitating trucks shall be smooth, mortar-tight, metal containers and shall be capable of discharging the concrete at a satisfactory controlled rate without segregation. If discharge of concrete is accomplished by tilting the body, the surface of the load shall be retarded by a suitable baffle. Covers shall be provided when needed for protection.

5. Discharge from non-agitating trucks shall be completed within 45 minutes from the time concrete is batched.

I. Admixtures that have been approved in writing by the Contracting Officer may be used to aid in setting or retarding times when pouring during hot or cold weather conditions. Provide this information and documentation prior to placement of concrete.

3.2 CONCRETE PLACEMENT

A. Placement and Consolidation

1. When concrete cannot be placed within the time frame specified above; do not place concrete, but remove it from the jobsite.

2. Concrete shall be placed only in the presence of the Contracting Officer who shall be notified 24 hours in advance of each intended concrete placement. No concrete shall be placed in any structure until the placement of reinforcing steel and the adequacy of the forms and falsework have been approved. Excess water shall be removed from the forms before concrete placement.

3. All concrete shall be consolidated by means of approved vibrators together with any other equipment necessary to perform the work as specified herein. Vibration shall be applied in the area of the freshly deposited concrete. The vibration shall be of sufficient duration and intensity to consolidate the concrete thoroughly within 15 minutes after it has been deposited in the forms. Vibration shall not be continued at any one point to the extent that localized areas of grout are formed. The contractor shall provide sufficient equipment to insure uninterrupted and continuous vibration of concrete.

4. Concrete shall be deposited as close as possible to its final position, and shall not be allowed to flow in a manner that will cause segregation of the materials. Concrete shall not be dropped more than 5-feet vertically without use of a tremie or similar device.

B. Weather Limitations

1. Under rainy conditions, placing of concrete shall be stopped before the quantity of surface water is sufficient to cause a flow or wash of the concrete surface or have a detrimental effect on the finished concrete and acceptance parameters.

2. Placing of concrete shall immediately cease if the hauling vehicles or any equipment or pedestrian traffic tracks mud on the prepared base or changes the allowable subgrade dimensional tolerances for concrete and slabs placed on subgrade.

C. Hot Weather Concreting: ACI 305R.
1. The temperature of the concrete mixture immediately before placement shall not exceed 90 degrees F. Forms, subgrade and reinforcing steel, shall be sprinkled with cool water just prior to placement of concrete. Mix water may be cooled by refrigeration, liquid nitrogen, or well-crushed ice of a size that will melt completely during the mixing operation. Crushed ice may be substituted for part of the mix water on a pound for pound basis.

D. Cold Weather Concreting: ACI 306R.

1. Materials needed for protection shall be on the jobsite before concrete work is started. Do not place concrete on a frozen subgrade or against surfaces having deposits of frost, snow, or ice.

2. The temperature of the mixed concrete immediately before placing shall not be less than 50 degrees F.

3. Concrete operations shall be discontinued when a descending air temperature in the shade and away from artificial heat falls below 40 degrees F nor shall concrete operations be resumed until ascending air temperature in the shade and away from artificial heat reaches 35 degrees F.

4. Mixing and placing concrete shall continue no later in any day than that time which will allow sufficient time to place and protect the concrete already poured before the air temperature drops to 35 degrees F.

5. Concrete operations may be allowed although the air temperature at any time during the cure period in the shade and away from artificial heat is below the limit permitted above. Where concrete operations are thus allowed, the contractor shall use equipment to heat the aggregates or water, or both, prior to mixing. If aggregates are heated, the minimum temperature shall be 60 degrees F and the aggregates shall have no chunks of ice or frozen aggregate present. Equipment used to heat the aggregates shall be such that consistent temperatures are obtained throughout the aggregate within each batch and from one batch to another. Water shall not be heated in excess of 150 degrees F unless the water is mixed with the aggregate prior to the addition of cement to the batch.

6. When concreting operations are allowed when the air temperature falls the contractor shall provide adequate insulation or heat, or both, to protect the concrete after placement. This protection shall be to the extent required to maintain a concrete surface temperature of not less than 50 degrees F for a period of 72 hours after placement and at not less than 40 degrees F for an additional 96 hours. When artificial heating is required, the heating units shall not locally heat or dry the surface of the concrete. A written outline of the proposed protection method shall be submitted for approval.

7. The placing of concrete will not be permitted all the necessary protection equipment and materials are on hand at the site and in satisfactory working condition. Concrete requiring cold weather protection shall have such protection removed at the end of the required period in a manner that will permit a gradual drop in the concrete temperature.

3.3 CONCRETE FINISHING

A. Concrete Surface Finishes:

1. Concrete decking slab shall have a roughened broom finish applied all in one direction; orientate brush lines in the direction that is parallel with the 1.5 percent (1.5%) slope toward the lake.

2. Formed surfaces will require a Class I Finish unless otherwise specified. Formed surfaces shall be finished immediately after the removal of forms in accordance with the requirements specified herein.
If rock pockets or honeycomb are of such an extent and character as to affect the strength of the structure and to endanger the steel reinforcement, the concrete may be declared defective and require the removal and replacement of that portion of the structure affected at the expense of the contractor. Formed surfaces normally in view of vehicular or pedestrian traffic, or not covered by fill material shall present a pleasing appearance of uniform color and texture commonly achieved by the use of clean, smooth plywood forms joined tightly or taped at the joints, preformed metal forms, paper tubing forms, or specially-coated forms.

3. Class I Finish:

All bolts, wires, snap-ties, and rods shall be clipped and recessed one inch below the surface of the concrete. All holes, honeycomb, rock pockets and other surface imperfect ions shall be cleaned to sound concrete, thoroughly moistened and carefully patched with mortar. A portion of the required cement shall be white as required to match the color of the surrounding concrete. Small voids due to entrapped air and water in precast members need not be patched.

4. Class II Finish:

The surface shall be patched and pointed as specified herein for Class I finish. When the mortar used in patching and pointing has set sufficiently, the surface shall be rubbed with cork, wood, or rubber floats, polystyrene, or a mechanical carborundum stone. During the rubbing process a thin mortar, matching the color of surrounding concrete, may be used to facilitate producing a satisfactory lather. The mortar used to produce a lather shall not be used in quantities sufficient to cause a plaster coating to be left on the finished surface. Rubbing shall continue until irregularities are removed and there is no excess material. At the time a light dust appears, the surface shall be brushed or sacked. Brushing or sacking shall be carried in one direction so as to produce a uniform texture and color.

B. Form Removal: Side forms of walls and beams may be removed after 1 to 3 days. Load-supporting forms and shoring shall not be removed until after 7 days or two-thirds of designed 28 day compressive strength is obtained or the 7-day test cylinders have been tested and results indicate an average strength adequate to support the load imposed on the concrete. All forms shall be completely removed after setting of concrete together with all temporary supports, etc., employed for construction purposes. Forms shall be readily removable without hammering or prying against the concrete.

C. Concrete Finish Patching: Immediately after the removal of the forms, remove bulges and projections on exposed concrete by chipping or tooling, and rub or grind the surface. Chip honeycombed or other defective areas to solid concrete; cut edges to right angles with the surface. Brush cavities with grout comprised of cement and water, and point with mortar comprised of cement, sand, and water similar to that used in the concrete. Keep the concrete thoroughly saturated with water during the finishing.

D. Joint Sealing: Use compressed air to blow dirt and dust from joints to be sealed. When joints are dry and dust-free, apply sealant in the joints according to the manufacturer's instructions. The finished joints shall have no depressions or protrusions and continuous seals shall be formed along the joints.

3.4 CONCRETE CURING

A. General Requirements:

1. All cast - in-place concrete shall be cured by one or by a combination of more than one of the methods specified herein and curing shall begin immediately after completion of machine or hand finishing of the fresh concrete.

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2. Curing times shall meet the following minimum requirements:
   a. ASTM C 150 Type I cement seven days
   b. ASTM C 150 Type II cement ten days
   c. ASTM C 150 Type III cement three days
   d. ASTM C 150 Type IV or V cement 14 days
   e. Alternatively the concrete shall be cured until it reaches 70% of its 28-day design strength

3. Surfaces requiring a Class II finish shall not be cured by the Liquid-Membrane Forming Compound Method until after the finishing operations are completed.

4. No traffic, hauling, storing of material or other work shall be allowed on any concrete surface during the required curing periods.

B. Water Curing Method:

1. All surfaces not covered by reasonably waterproof forms shall be kept damp by applying water with a nozzle that so atomizes the flow of the water that a fog mist and not a spray is formed until the surface of the concrete is covered with a curing medium or sprinkling of the surface is permitted. The moisture from the nozzle shall not be applied under pressure directly upon the concrete and shall not be allowed to accumulate on the concrete in a quantity sufficient to cause a flow or wash the surface.

2. If a curing medium is used, the concrete shall be kept continuously wet by sprinkling with water for the entire curing period. Burlap, rugs, carpets, or earth or sand blankets may be used as a curing medium to retain the moisture during the curing period. Application of the curing medium shall not begin until such time that placement can be made without marring the surfaces of the concrete.

3. If a curing medium is not used, the entire surface of the concrete shall be kept damp by the application of water with an atomizing nozzle as specified above until the concrete has set, after which the entire surface of the concrete shall be sprinkled continuously with water for the entire curing period.

4. In no case shall curing be interrupted by more than one hour during the curing period.

C. Liquid-Membrane Forming Compound Method:

1. All surfaces not covered by reasonably waterproof forms shall be cured by the liquid-membrane forming compound method. The curing compound shall be applied to the concrete immediately following the surface finishing operation in one or more applications totaling a rate of not less than one gallon per 100 square feet.

2. The curing compound shall form a continuous unbroken surface.

3. If the membrane film is broken during the curing period, the broken area shall be given a new application of compound at a rate sufficient to assure uniform coverage.

4. In no case shall curing be interrupted by more than one hour during the curing period.
D. Forms in Place Method:

1. Formed surfaces of concrete may be cured by retaining the forms in place. The forms shall remain in place for the entire curing period.

2. All joints in the forms and the joints between the end of forms and concrete shall be kept moisture-tight during the curing period.

3. Cracks in the forms and cracks between the forms and the concrete shall be resealed by approved methods.

3.5 FIELD QUALITY CONTROL

A. Comply with Section 01 40 00 – QUALITY REQUIREMENTS and the following:

B. Testing: The Contractor shall make arrangements for the approved testing company to perform concrete sampling and testing and distribute the results to the Contracting Officer within 5 working days after each test.

1. Testing laboratory will be responsible for:
   
   a. Supplying 6 inch by 12 inch test cylinder molds to the jobsite and taking of cylinder samples.
   
   b. Testing for air, slump, temperature, compressive strength and aggregate gradation and other tests specified herein.
   
   c. Preparing test reports.
   
   d. Contractor shall supply concrete for all tests.

2. Materials gathered for testing shall be conducted in the presence of the Contracting Officer who shall be given 24-hour notice before materials are gathered.

B. Sampling: ASTM C172; Collect samples of fresh concrete to perform tests specified. ASTM C31 for making test specimens.

C. A sample of concrete for determination of temperature, slump, and air content (when required) as well as for fabrication of test cylinders for compressive strength determination at 28 days will be taken at random at the specified sampling frequency for each type of concrete. Samples of concrete shall be of sufficient size to perform all the required tests and fabricate the necessary test cylinders. If concrete is pumped to facilitate placement, samples shall be taken from the truck and pump hose discharge to determine that the compressive strength specifications are met in the structure, and to correlate temperature, slump and air content results. If the correlation is satisfactory, sampling may continue from the most convenient location with occasional re-testing for correlation. Rejection of concrete due to improper temperature or slump may occur at either the truck or pump hose discharge; however, rejection of concrete due to improper air content will only occur due to a failing test for a sample obtained at the final point of discharge.

D. Slump Tests: ASTM C143. Take concrete samples during concrete placement. The maximum slump may be increased as specified with the addition of an approved admixture provided the water-cement ratio is not exceeded. Perform tests at commencement of concrete placement, when test cylinders are made, and for each batch (minimum) or 20 cubic yards (maximum) of concrete.
E. Temperature Tests: ASTM C 1064. Test the concrete delivered and the concrete in the forms. Perform tests in cold or hot weather conditions (below 50 degrees F or above 80 degrees F) for each batch (minimum) or every 20 cubic yards (maximum) of concrete, until the specified temperature is obtained, and whenever test cylinders and slump tests are made.

F. Compressive Strength Tests: ASTM C39. Make five test cylinders for each set of tests in accordance with ASTM C31. Take precautions to prevent evaporation and loss of water from the specimen. Test two cylinders at 7 days, two cylinders at 28 days, and hold one cylinder in reserve. Take samples for strength tests of each mix design of concrete placed each day for each structure, not less than once a day, and not less than once for each 100 cubic yards of concrete, and not less than once for each 5,000 square feet of surface area for slabs or walls. For the entire project, take no less than five sets of samples and perform strength tests for each mix design of concrete placed. Each strength test result must be the average of two cylinders from the core sample tested at 28 days. If the average of any three consecutive strength test results is less than f’c or if any strength test result falls below f’c by more than 450 psi; take a minimum of three ASTM C42 core samples from the in-place work represented by the low test cylinder results and test. Concrete represented by core test is considered structurally adequate if the average of three cores is equal to at least 85 percent of f’c and if no single core is less than 75 percent of f’c. Retest locations represented by erratic core strengths. Remove concrete not meeting strength criteria and provide new acceptable concrete. Repair core holes with non-shrink grout. Match color and finish of adjacent concrete.

G. Air Content: ASTM C173 or ASTM C231 for normal weight concrete. Test air-entrained concrete for air content at the same frequency as specified for slump tests.

H. Strength of Concrete Structure: Compliance with the following is considered deficient if it fails to meet the requirements which control strength of structure in place, including following conditions:

1. Failure to meet compressive strength tests as evaluated
2. Reinforcement not conforming to requirements specified
3. Concrete which differs from required dimensions or location in such a manner as to reduce strength
4. Concrete curing and protection of concrete against extremes of temperature during curing, not conforming to requirements specified
5. Concrete subjected to damaging mechanical disturbances, particularly load stresses.

I. Testing Concrete Structure for Strength: When there is evidence that strength of concrete structure in place does not meet specification requirements, make cores drilled from hardened concrete for compressive strength determination in accordance with ASTM C42, and as follows:

1. Take at least three representative cores from each member or area of concrete-in-place that is considered potentially deficient. Location of cores will be determined by the Contracting Officer.
2. Test cores after moisture conditioning in accordance with ASTM C42 if concrete they represent is more than superficially wet under service.
3. Air dry cores, (60 to 80 degrees F with relative humidity less than 60 percent) for 7 days before test and test dry if concrete they represent is dry under service conditions.
a. Strength of cores from each member or area is considered satisfactory if their average is equal to or greater than 85 percent of the 28-day design compressive strength of the class of concrete.

b. Core specimens will be taken and tested by the Government. If the results of core-boring tests indicate that the concrete as placed does not conform to the drawings and specification, the cost of such tests and restoration required shall be borne by the Contractor.

c. Fill core holes solid with patching mortar and finished to match adjacent concrete surfaces.

d. Correct concrete work that is found inadequate by core tests in a manner approved by the Contracting Officer.

J. Slab Smoothness:

a. Slab smoothness shall be measured using a 10 foot metal straightedge.

b. Measurements shall be at random locations and directions field approved by the Contracting Officer.

c. The surface shall not vary in any direction by more than 1/8 inch from the design grade, except at construction or expansion joints. Finished slope towards water shall not exceed 1.5 percent (1.5%).

d. The surface may vary up to 1/4 inch across construction or expansion joints

e. The slab shall have positive drainage. Positive drainage shall be verified by flooding with water. Sufficient water shall be provided to completely cover the entire surface of the slab and shall run off freely. Surfaces which retain water to a depth greater than 1/4 inch shall be repaired.

3.6 PROTECTION

A. Requirements: Concrete shall be protected from mechanical and chemical damage resulting from construction activities. Footings shall be protected from impact and wheel traffic.

B. Opening to Traffic

a. No vehicular traffic will be all owed on the structure until at least 10 days after the last concrete has been placed in each continuous portion of a structure and until the compressive strength of all placed concrete has reached the required 28-day compressive strength on structures in which cast-in-place concrete has been used.

3.7 WASTE MANAGEMENT

A. As specified in the Waste Management Plan and as follows:

1. Concrete Washout
a. Before concrete pours, designate the temporary concrete washout facility which meets environmental standards for cleaning out concrete mixing trucks.

b. Washout shall be contained in a concrete, metal, polyethylene or vinyl lined container to prevent water leakage onto the ground. Washout water and solids shall not be discharged onto the ground surface.

c. Minimize water used to wash equipment.

d. Washout container shall be cleaned out or new facility constructed and ready for use once the washout container is 75% full.

e. Temporary concrete washout facilities shall be located a minimum of 50 feet from the lake. Each facility shall be located away from construction traffic or access areas to prevent disturbance or tracking.

2. Hardened, Cured Waste Concrete

   a. Remove from site. Dispose at landfill or recycle.

3. Other Waste

   a. Identify concrete manufacturer's or supplier's policy for collection or return of construction waste, unused material, deconstruction waste, and/or packaging material.

   b. Return excess cement to supplier.

   c. Institute deconstruction and construction waste separation and recycling for use in manufacturer's programs. When such a program is not available, seek local recyclers to reclaim the materials.

3.8 INSTALLATION OF DOCK BUMPERS AND CLEATS

   A. Bumpers: As recommended by the manufacturer, as shown on the drawings and bumpers shall be installed for the full length of the deck slab on the waterfront edge, including corner bumpers.

   B. Cleats: Install as recommended by the manufacturer; 12 cleats, spaced approximately 10 feet on-center along the waterfront edge; beginning with offset of approximately 2 1/2 feet at each end of the dock and offset approximately 12 inches from the waterfront edge.

END OF SECTION 03 31 00
SECTION 31 10 00 – SITE CLEARING

SECTION 31 11 00 - CLEARING AND GRUBBING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Work for this section shall include providing all the labor and equipment necessary to trim, remove and dispose of site vegetation, construction debris, river rock slope cover and all other objectionable material from the work area.

B. Clearing and grubbing shall be performed in advance of grading operations.

1.2 SUBMITTALS

A. General: There are no submittals for this section.

1.3 PROJECT/SITE CONDITIONS

C. Work Limits and Control Points:

1. Contractor shall stake the temporary fencing and clearing limits and flag proposed trees and vegetation to be removed or trimmed according to the Clearing Limits shown on the drawings.

2. Installation of Temporary Fencing and clearing shall not begin until the Contracting Officer has provided written approval of the fencing and clearing limits.

3. Do not remove or relocate any trees or vegetation outside the immediate work area without written approval from the Contracting Officer.

4. All ground vegetation and trees impacting the wall construction area shall be removed or trimmed by the Contractor.

D. Environmental Considerations: Refer to Sections –SPECIAL PROCEDURES, and TEMPORARY FACILITIES AND CONTROLS.

PART 2 - PRODUCTS (not used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Visually verify the extent and location of clearing prior to commencing work.

3.2 PREPARATION:

A. Tree branches extending over the slab, ramp, walls or fence, which hang within 8 feet of the finish grade or that restrict sight distance shall be cut off close to the trunk or stem of the tree in a neat and workmanlike manner. The Contractor shall remove additional tree branches under the direction of the Contracting Officer, in such a manner that the tree will present a balanced appearance.
B. Protection: Protect existing facilities and site appurtenances from damage. Damage shall be repaired or replaced at the Contractor's expense. Repair work shall not begin until authorized in writing by the Contracting Officer.

3.3 CLEARING/GRUBBING/SITE PREP

A. Site Preparation: Prior to obtaining Contracting Officer’s approval to commence with Clearing and Grubbing:

   1. Field-mark trees to be removed with ORANGE flagging.
   
   2. Field-mark trees to be trimmed with BLUE flagging.

B. Clearing and Grubbing: Once approval in writing is obtained from the Contracting Officer, raze, remove and dispose of brush, trees, and limbs in the construction area that may affect the work. Bundle brush, limbs and other materials into manageable piles tying with rope and stockpile within Partner’s Point Work Yard at a location field-approved by the Contracting Officer. All loose debris shall be raked up when completed.

C. Disposal: The Contractor shall not use the Government’s 40 yard dumpster to dispose of brush, weeds, limbs and clearing debris, any construction materials, or excess concrete.

D. Removal of Debris:

   1. Remove the river rock slope cover from the slopes. River rock shall be salvaged for reuse in the finished construction and excess shall be removed from the work site and stockpiled within Partner’s Point Work Yard at the location field-approved by the Contracting Officer.
   
   2. All tree trunks, stumps, brush, limbs, roots, and vegetation shall be removed from the work site and stockpiled within Partner’s Point Work Yard at the location field-approved by the Contracting Officer.
   
   3. All other debris removed by clearing and grubbing shall be removed to locations outside of and out of sight of the work limits, or otherwise disposed of so as to leave the construction site and adjacent areas in a neat and finished condition, free from unsightly debris.

E. Vegetation: For vegetation that is to be removed, completely remove all vegetation and roots of trees and brush that may impact wall or footings. No vegetative matter or debris shall be incorporated into any fill material.

F. The dragging and the piling of materials of various kinds and the performing of other work which may be injurious to vegetation shall, insofar as practicable, be confined to areas which have no vegetation or which will be covered by embankment or disturbed by excavation during grading operations.

G. From excavated areas, all stumps, roots and other obstructions 3 inches or over in diameter shall be grubbed to a depth of not less than 18 inches below finish grade.

H. In embankment areas or other areas to be cleared outside the structure limits, all stumps, roots and other obstructions shall not be left higher than specified in Table 1. Under the concrete deck slab and under retaining walls, all stumps 6 inches or over in diameter shall be grubbed to 18 inches below original grade.
TABLE 31 11 00 – 1: EMBANKMENT CLEARING AND GRUBBING

<table>
<thead>
<tr>
<th>Height of Embankment Over Stump</th>
<th>Height of Clearing and Grubbing</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Feet to 2 Feet</td>
<td>All stumps or roots 6 inches or over in diameter shall be grubbed to 18 inches below original grade. All others shall be cut flush with the ground.</td>
</tr>
<tr>
<td>2 Feet to 3 Feet</td>
<td>All stumps 1 foot and over in diameter shall be grubbed to 18 inches below original grade. All others shall be cut flush with the ground.</td>
</tr>
<tr>
<td>Over 3 Feet</td>
<td>No stumps shall be left higher than the stump top diameter, and in no case more than 18 inches.</td>
</tr>
</tbody>
</table>

I. Cavities left below subgrade elevation by removal of stumps or roots shall be backfilled and compacted.
   1. Where cavities are located beneath access ramp, walls or slabs, backfill material shall be structural fill compacted to 95% of the maximum density in accordance with SECTION 31 23 00 - EXCAVATION AND FILL.
   2. Where cavities are located in cut slopes, backfill shall be satisfactory materials in accordance with SECTION 31 23 00 - EXCAVATION AND FILL.

3.4 SALVAGE

A. River rock shall be salvaged for reuse on the project as riprap.

B. Tree limbs and brush shall be salvaged and stockpiled within Partner’s Point Work Yard as field approved by the Contracting Officer for future use by the Government.

3.5 CLEANUP

A. Site Grading: Grade and rake areas affected by clearing and grubbing to existing surrounding grades. Maintain surrounding contours of site.

END OF SECTION 31 11 00
PART 1: GENERAL

1.1 SUMMARY

A. Section includes: Excavating, grading, filling, backfilling, and compaction.

B. Dredging at the face of the sheet pile seawall.

1.2 SUBMITTALS

A. General: Submittals shall be according to Section 01 33 00 – Submittal Procedures.

B. Submit test results for backfill and bedding compaction to specified percentage of maximum dry density as determined by ASTM D 698.

C. Submit test results of backfill and bedding for Footings, Foundations, and Slabs meeting gradations as determined by AASHTO T 27.

D. Submit compaction test results for each material type and source.

E. Submit the following for dredging excavation:

1. Dredging equipment access area and proposed soil erosion and sediment control measures.

2. Sediment dewatering methods, details and layout

3. Location and plan for disposal of dredged material

4. Pre-dredge and post-dredge survey data and drawings

5. Drawings and survey data made during the progress of the work.

6. Contractors work plan and schedule

7. List of proposed equipment to be used and specifications for the equipment

1.3 DEFINITIONS

A. Degree of Compaction: Degree of compaction is expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D698 (Standard Proctor Method) or ASTM D1557 (Modified Proctor Method), for general soil types, abbreviated as percent laboratory maximum density.

B. Rock: Solid homogeneous interlocking crystalline material with firmly cemented, laminated, or foliated masses or conglomerate deposits, neither of which can be removed without systematic drilling and blasting, drilling and the use of expansion jacks or feather wedges, or the use of backhoe-mounted pneumatic hole punchers, hoe rams or rock breakers; also large boulders, buried masonry, or concrete other than pavement exceeding 1 cubic yard in volume.
C. Rock Excavation: Removal of rock material as defined herein shall be considered rock excavation.

D. Common Excavation: Excavation of materials of whatever nature, which are not included under definitions of rock excavation.

E. Dredging: Excavation of material from below the water surface.

F. Fill Material: Material used in construction of fills and backfills.

G. Topsoil: Surface soil approximately 4 - 6 inches in depth that supports growth of vegetation and contains organic matter.

1.4 QUALITY ASSURANCE

A. Failure Criteria: Not limited to the following:

1. Settlement of embankment fill or backfill which would allow moisture to pond against the foundation or within a horizontal distance from the foundation equal to its design depth.

2. Sliding or subsidence of embankment fill or backfill which displaces the material from the designed elevations, slopes and grades.

1.5 PROJECT AND SITE CONDITIONS

A. Final surfaces shall be graded and finished as shown on the drawings and described in the specifications. Unfinished surfaces adjacent to constructed elements and disturbed during construction operations shall be similar to and shall blend with the adjacent terrain; grade to produce a well-drained surface. Hand rake as necessary to remove excess material in areas inaccessible to construction equipment.

PART 2: PRODUCTS

2.1 SOIL MATERIALS

A. Satisfactory Materials: Any materials classified by ASTM D2487 as GW, GP, GM, GP-GM, GW-GM, SW, SP, SM, SW-SM, SP-SM, free of debris, roots, wood, scrap material, vegetation, refuse, soft unsound particles, and deleterious, or objectionable materials. Unless specified otherwise, the maximum particle diameter shall be 2 inches.

B. Unsatisfactory Materials: Materials which do not comply with the requirements for satisfactory materials. Unsatisfactory material also includes material classified as satisfactory which contains root and other organic matter, frozen material, or stones larger than 2 inches. The Contracting Officer shall be notified of any contaminated materials.

C. Backfill and Fill Material:

1. ASTM D2487, classification GW, GP, GM, SW, SP, SM, with a maximum ASTM D4318 plasticity index of 12, and a maximum of 25 percent by weight passing ASTM D1140, No. 200 sieve.
D. Structural Fill Material:

1. The material shall be a well graded mixture of granular sand, gravel or crushed aggregate and shall be non-plastic.
2. Clean on-site, granular soils or imported materials may be used as structural fill. Maximum size shall be 2 inch.
3. Imported soils shall conform to the following.
   a. Gradation shall meet the following percentages by weight as determined in accordance with the requirements of AASHTO T27 & T11:

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Passing by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 inches</td>
<td>100</td>
</tr>
<tr>
<td>3/4 inches</td>
<td>70 - 100</td>
</tr>
<tr>
<td>No. 4</td>
<td>50 – 100</td>
</tr>
<tr>
<td>No. 200</td>
<td>0 – 30</td>
</tr>
</tbody>
</table>

   b. Maximum expansive potential shall not exceed 1.5%. Expansive potential shall be measured on a sample compacted to approximately 95% of the ASTM D698 maximum dry density at about 2 percent below optimum water content. The sample is then confined under a 100 psf surcharge and submerged.

   c. Maximum soluble sulfates shall not exceed 0.10%

E. Topsoil:

1. Natural, friable soil representative of productive, well-drained soils in the area, free of subsoil, stumps, rocks larger than one inch diameter, brush, weeds, toxic substances, and other material detrimental to plant growth.
2. Amend topsoil pH range to obtain a pH of 5.5 to 7.

F. Aggregate Base Course Material:

1. Gradation shall meet the following percentages by weight as determined in accordance with the requirements of AASHTO T27 & T11.

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Passing by weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 inches</td>
<td>100 percent</td>
</tr>
<tr>
<td>3/4 inches</td>
<td>90 – 100 percent</td>
</tr>
<tr>
<td>No. 8</td>
<td>35 – 55 percent</td>
</tr>
<tr>
<td>No. 200</td>
<td>0 – 8 percent</td>
</tr>
</tbody>
</table>

2. Maximum Plasticity Index shall be 3 as determined according to AASHTO T 90.
G. Backfill Material for Walls, footings and Slabs:

1. Material shall be structural fill and shall meet the requirements in subsection 2.1.E. Alternatively, it may be aggregate base course material per subsection 2.1.G.

2. Pervious backfill material for walls shall be per subsection 2.1.I.

H. Pervious Backfill Material:

1. Aggregate shall be of the material and gradation specified herein for the indicated grades.

   a. Grade 1.

      The aggregate shall be ASTM C33 sand.

   b. Grade 2.

      The aggregate shall be a washed sand-gravel mixture in accordance with the following gradation requirements:

      | Sieve Size | Percent Passing by weight |
      |------------|---------------------------|
      | 1 inches   | 100 percent               |
      | 1/2 inches | 55 – 90 percent           |
      | No. 10     | 25 – 50 percent           |
      | No. 40     | 10 – 30 percent           |
      | No. 100    | 0 – 10 percent            |
      | No. 200    | 0 – 8 percent             |

   c. Grade 3.

      The aggregate shall be gravel, crushed stone, or reclaimed concrete, in accordance with the following gradation requirements:

      Gradation A

      | Sieve Size   | Percent Passing by weight |
      |--------------|---------------------------|
      | 1 1/2 inches | 100 percent               |
      | 1 inches     | 95 – 100 percent          |
      | 1/2 inches   | 24 – 60 percent           |
      | No. 4        | 0 – 10 percent            |
      | No. 8        | 0 – 5 percent             |
Gradation B

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Passing by weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 inches</td>
<td>100 percent</td>
</tr>
<tr>
<td>3/4 inches</td>
<td>90 – 100 percent</td>
</tr>
<tr>
<td>3/8 inches</td>
<td>20 – 55 percent</td>
</tr>
<tr>
<td>No. 4</td>
<td>0 – 10 percent</td>
</tr>
<tr>
<td>No. 8</td>
<td>0 – 5 percent</td>
</tr>
</tbody>
</table>

I. Controlled Low Strength Material:

1. Controlled Low Strength Material (CLSM) shall be a concrete mixture which has consistency, workability, plasticity and flow characteristics such that the material when placed is self-compacting. Mixture proportions shall be 1 sack Portland cement per cubic yard of CLSM. When pumpable mixes or increased workability are required, the addition of fly ash or a natural Pozzolan in excess of the required Portland cement content may be used. A minimum of 40% coarse aggregate shall be used. Slump shall be 9 ± 2 inches. A mix design shall be submitted for approval prior to use.

J. Gravel Mulch:

1. Material shall be free of debris, fines and soil particles. Gravel mulch shall consist of a combination of crushed and rounded material with a minimum of 50 percent by weight crushed material. Crushed rock shall have at least 50 percent of the rock having three fractured faces.

2. A sample shall be submitted to the Contracting Officer prior to delivery to the site. Nominal size shall be 1 inch screened aggregate.

3. Gravel mulch shall be gold or natural desert in color. Color shall be approved by the Contracting Officer prior to delivery to the site.

K. Riprap:

1. Riprap shall consist of salvaged river rock from the site. River rock shall not contain excessive amounts of debris, fines and soil particles. Salvaged river rock used for riprap shall not contain more than 25% sand or smaller particles.

2. Imported riprap shall consist of rounded river rock. The supplied rock shall be in accordance with the following gradation requirements:

<table>
<thead>
<tr>
<th>Size</th>
<th>Percent Passing by weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 inches</td>
<td>100 percent</td>
</tr>
<tr>
<td>6 inches</td>
<td>40 - 60 percent</td>
</tr>
<tr>
<td>2 inches</td>
<td>0 - 20 percent</td>
</tr>
</tbody>
</table>

3. Geotextile fabric to be used under riprap or gravel mulch shall be a woven monofilament fabric or nonwoven fabric consisting only of long chain polymeric filaments such as polypropylene or polyester formed into a stable network such that the filaments retain their relative position to each other. Slit film
fabric will not be acceptable. The fabric shall be inert to commonly encountered chemicals, resistant to rot and mildew and shall have no tears or defects which adversely affect or alter its physical properties. The physical properties (average roll values) shall be as follows:

- **a)** Grab elongation shall be 15% minimum, 115% maximum
- **b)** Permittivity shall be 0.5 minimum
- **c)** Grab tensile strength shall be 200 lbs. minimum
- **d)** Apparent Opening Size shall be 30 – 140 (U.S. Standard Sieve)
- **e)** Ultraviolet Stability shall be 70% minimum

L. **Sand Bedding**

1. Sand shall conform to ASTM C33 except for gradation.

   The aggregate shall be a washed sand mixture in accordance with the following gradation requirements:

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Passing by weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8 inches</td>
<td>100 percent</td>
</tr>
<tr>
<td>No. 4</td>
<td>90 – 100 percent</td>
</tr>
<tr>
<td>No. 200</td>
<td>0 – 12 percent</td>
</tr>
</tbody>
</table>

**PART 3: EXECUTION**

**3.1 PROTECTION**

A. **Shoring and Sheeting:** Design, construct and maintain temporary shoring, bracing, underpinning, and sheet piling necessary to protect the excavation. Remove protective devices when safe to do so or as authorized by the Contracting Officer. Portions wholly buried by earth and at a distance of at least 18 inches from permanent structures may be left in place in the completed work. The exposed portion of the sheeting and shoring must be removed before completing the backfill.

B. **Drainage:** So that construction operations progress successfully, completely drain construction site during periods of construction to keep soil materials sufficiently dry. The Contractor shall establish/construct storm drainage features at the earliest stages of site development, and throughout construction shall grade the construction area to provide positive surface water runoff away from the construction activity and/or provide temporary ditches, dikes, swales, and other drainage features and equipment as required to maintain dry soils, prevent erosion and undermining of foundations. When unsuitable working platforms for equipment operation and unsuitable soil support for subsequent construction features develop, remove unsuitable material and provide new soil material as specified herein. It is the responsibility of the Contractor to assess the soil and ground water conditions presented by the plans and specifications and to employ necessary measures to permit construction to proceed. Excavated slopes and backfill surfaces shall be protected to prevent erosion and sloughing. Excavation shall be performed so that the site, the area immediately surrounding the site, and the area affecting operations at the site shall be continually and effectively drained.
C. Dewatering: Groundwater or lake water flowing toward or into excavations shall be controlled to prevent sloughing of excavation slopes and walls, boils, uplift and heave in the excavation and to eliminate interference with orderly progress of construction.

3.2 SURFACE PREPARATION

A. Clearing and Grubbing: Clearing and grubbing shall be completed per Section 31 11 00 – CLEARING AND GRUBBING.

B. Stripping: Strip suitable topsoil from the site where excavation or grading is indicated and stockpile separately from other excavated material. The top 4 – 6 inches of topsoil shall be stockpiled separately. Material unsuitable for use shall be stockpiled separately. Locate topsoil so that the material can be used readily for the finished grading. Protect topsoil and keep in segregated piles until needed.

C. Unsuitable Material: Remove vegetation, debris, decayed vegetable matter, sod, mulch, trash and rubbish from all areas within the limits of excavation and fill.

3.3 EXCAVATION

A. Excavation: Excavate to contours, elevation, and dimensions indicated on the plans. Reuse excavated materials that meet the specified requirements for the material type required at the intended location. Keep excavations free from water. Excavate soil disturbed or weakened by Contractor's operations, soils softened or made unsuitable for subsequent construction due to exposure to weather. Excavations below indicated depths will not be permitted except to remove unsatisfactory material. Unsatisfactory material encountered below the grades shown shall be removed as directed. Refill with satisfactory material and compact to 95 percent of ASTM D698 maximum density. Unless specified otherwise, refill excavations cut below indicated depth with satisfactory material and compact to 95 percent of ASTM D698 maximum density. Satisfactory material removed below the depths indicated, without specific direction of the Contracting Officer, shall be replaced with satisfactory materials to the indicated excavation grade; except as specified for footings. Determination of elevations and measurements of approved over-depth excavation of unsatisfactory material below grades indicated shall be done under the direction of the Contracting Officer.

B. Structures With Footings: Excavation depth shall be to the elevations shown on the drawings. Excavation widths shall be to the neat-lines shown on the drawings not to exceed nine (9) inches in any direction beyond the indicated depths and widths. Ensure that footing subgrades have been inspected and approved by the Contracting Officer prior to concrete placement. Each subgrade upon which concrete or aggregate base course material are placed shall be firm and free from water. Subgrade shall be scarified to a depth of 8 inches and mechanically compacted to 95 percent and tested for compaction by a certified testing company. Backfill over-excavated subgrade at the Contractor’s expense with concrete, CLSM or structural fill compacted to a minimum of 95% of maximum dry density prior to placement of concrete foundations.

C. Rock Excavation: Remove rock to elevations indicated in a manner that will leave foundation material in an un-shattered and solid condition. Roughen level surfaces and cut sloped surfaces into benches for bond with concrete. Removal of rock beyond lines and grades indicated will not be grounds for a claim for additional payment unless previously authorized by the Contracting Officer. Excavation of the material claimed as rock shall not be performed until the material has been cross sectioned by the Contractor and approved as Rock by the Contracting Officer. Common excavation shall consist of all excavation not classified as rock excavation.

D. Excavated Materials: Satisfactory excavated material required for fill or backfill shall be placed in the proper section of the permanent work as required or shall be stockpiled separately if it cannot be readily placed.
E. Final Grade of Surfaces to Support Concrete: Excavation to final grade shall not be made until just before concrete is to be placed. Approximately level surfaces shall be roughened, and sloped surfaces shall be cut as indicated into rough steps or benches to provide a satisfactory bond. All surfaces shall be protected from erosion resulting from ponding or flow of water.

3.4 SUBGRADE PREPARATION

A. Unsatisfactory material in surfaces to receive fill or in excavated areas shall be removed and replaced with satisfactory materials as shown on the drawings and described in the specifications.

B. The surface shall be scarified to a depth of 8 inches before the fill is started. Sloped surfaces steeper than 1 vertical to 4 horizontal shall be plowed, stepped, benched, or broken up so that the fill material will bond with the existing material.

C. When subgrades are less than the specified density, the ground surface shall be broken up to a minimum depth of 8 inches, pulverized, and compacted to the specified density. When the subgrade is part fill and part excavation or natural ground, the excavated or natural ground portion shall be scarified to a depth of 8 inches and compacted as specified for the adjacent fill.

D. Material shall not be placed on surfaces that are muddy, frozen, or contain frost.

E. Compaction shall be accomplished by approved equipment well suited to the soil being compacted.

F. Material shall be moistened or aerated as necessary to provide the moisture content that will readily facilitate obtaining the specified compaction with the equipment used. Minimum subgrade density shall be as specified herein.

3.5 FILLING AND BACKFILLING

A. Fill and backfill to contours, elevations, and dimensions indicated. Compact each lift before placing overlaying lift.

B. Common Fill Placement: Use satisfactory materials. Place in 6 inch lifts. Compact areas not accessible to rollers or compactors with mechanical hand tampers. Aerate material excessively moistened by rain to satisfactory moisture content. Finish to a smooth surface by blading, rolling with a smooth roller, or both.

C. Backfill and Fill Material Placement: Provide for paved areas and under concrete slabs, except where select material is provided. Place in 6 inch lifts. Do not place over wet areas. Place backfill material adjacent to structures as the structural elements are completed and accepted. Backfill against concrete only when approved. Place and compact material to avoid loading upon or against the structure.

D. Select Material Placement: Place in 6 inch lifts. Do not place over wet or frozen areas. Backfill adjacent to structures shall be placed as structural elements are completed and accepted. Backfill against concrete only when approved. Place and compact material to avoid loading upon or against structure.

E. Backfill and Fill Material Placement at Walls: Backfilling shall not begin until construction below finish grade has been approved, forms removed, and the excavation cleaned of trash and debris. Backfill shall be brought to finished grade as shown on the drawings. Heavy equipment for spreading and compacting backfill shall not be operated closer to foundation or retaining walls than a distance equal to the height of backfill above the top of footing; the area remaining shall be compacted in layers not more than 4 inches in
compacted thickness with power-driven hand tampers suitable for the material being compacted. Backfill shall be placed carefully around pipes to avoid damage to coatings or wrappings. Backfill shall not be placed against concrete walls prior to 7 days after completion of the walls. As far as practicable, backfill shall be brought up evenly on each side of the wall and sloped to drain away from the wall.

F. Trench Backfilling: Backfill as rapidly as construction, testing, and acceptance of work permits. Place and compact backfill under structures and paved areas in 6 inch lifts to top of trench and in 6 inch lifts to 8 inch lifts in paved areas.

3.6 BORROW

A. Where satisfactory materials are not available in sufficient quantity from required excavations, approved borrow materials shall be obtained as specified herein.

3.7 COMPACTION

A. Determine in-place density of existing subgrade; if required density exists, no compaction of existing subgrade will be required. Density requirements specified herein are for cohesionless materials.

B. General Site: Compact underneath areas designated for vegetation and areas outside the 5 foot line of the paved area or structure to 85 percent of ASTM D698.

C. Structures, Spread Footings, and Concrete Slabs: Compact top 12 inches of subgrades to 95 percent of ASTM D698. Compact select material, structural fill or aggregate base course to 95 percent of ASTM D698.

D. Adjacent Area: Compact areas within 5 feet of structures to 90 percent of ASTM D1557.

E. Paved Areas: Compact top 12 inches of subgrades to 95 percent of ASTM D698. Compact fill and backfill materials to 95 percent of ASTM D698.

F. Sheet Pile: No vibratory or impact compaction equipment shall be allowed within 2 feet of sheet pile.

G. Gravel Mulch: Compact underneath fill areas designated for gravel mulch to 90 percent of ASTM D698.

H. Riprap: Compact underneath fill areas designated for riprap to 90 percent of ASTM D698.

3.8 RIP-RAP CONSTRUCTION

A. Construct rip-rap on filter fabric in the areas indicated.

B. Preparation: Trim and dress indicated areas to conform to cross sections, lines and grades shown within a tolerance of 0.1 foot. Place filter fabric on prepared subgrade as indicated. Anchor fabric at the top of slope.

C. Stone Placement: Place rock for rip-rap to produce a well graded mass with the minimum practicable percentage of voids in conformance with lines and grades indicated. Distribute larger rock fragments, with dimensions extending the full depth of the rip-rap throughout the entire mass and eliminate "pockets" of small rock fragments. Rearrange individual pieces by mechanical equipment or by hand as necessary to obtain the distribution of fragment sizes specified above.
3.9 DREDGING

A. Description of Work

1. The Contractor shall provide all materials, labor, tools and equipment required to complete the Work. Items of work include but are not limited to:

   a) Construction layout and pre-dredging survey
   b) Site clearing of the dredge access area if necessary
   c) Assembling the dredge, pipeline and other equipment including testing the pipeline for leaks
   d) Installation, maintenance and removal of soil erosion and sediment control measures for the dredge access area and dewatering areas
   e) Transporting the dredged material to the dewatering equipment/area and disposal of the dredged material
   f) Performing a post dredging survey
   g) Removal of the dredging equipment

2. Material To Be Removed

   a) Native material to be removed is primarily sand, gravel and cobbles. No rock is anticipated.

3. Overdepth Dredging

   a) To cover unavoidable inaccuracies of dredging processes, material actually removed to a depth of up to 2 feet below the depth specified and within the dredging limits will be measured and paid for at full contract price.

4. Side Slopes

   a) Dredging on side slopes shall follow, as closely as practicable, the lines indicated or specified.
   b) A 2 feet horizontal allowance will be made for dredging beyond the indicated or specified side slopes, except as provided herein.

5. Surveys

   a) The plans and quantities were developed based on assumed elevations below the water.
   b) The Contractor shall conduct a pre-dredging and post-dredging survey. Both surveys shall be conducted by a licensed surveyor and the methods and surveys shall be approved by the Contracting Officer.

6. Dewatering

   a) The contractor shall dewater the dredged material as required for disposal.
B. Quality Control

1. The Contractor shall be responsible for the quality of the work and shall develop and propose programs and methods of construction and testing such as to achieve the specified quality.

2. The Contractor shall carry out inspection, sampling and testing procedures in accordance with SECTION 01 40 00-QUALITY REQUIREMENTS.

C. Execution

1. Interference with Navigation
   
   a) Minimize interference with the use of channels and passages.
   
   b) The Contracting Officer will direct the shifting or moving of dredges or the interruption of dredging operations to accommodate the movement of vessels and floating equipment, if necessary.

2. Disposal of Dredged Material
   
   a) Provide for safe transportation and disposal of dredged materials.
   
   b) Transport and dispose of dredged material in the area designated for transfer of dredged material.
   
   c) Dispose of dredged material according to approved Dredging Plan.
   
   d) The deposit of dredged materials in unauthorized places is forbidden.
   
   d) The Contractor shall dispose of debris uncovered during the dredging operation at an acceptable landfill.

3. Disposal of Excavated Materials
   
   a) In depositing excavated materials approved for fill, uniformly grade and allow for shrinkage. Provide and maintain necessary bulkheads, dikes, ditches, weirs, spillways, and other construction necessary to confine and retain the fill in the dredge fill area.

4. Disposal of Excess Excavated Suitable Materials
   
   a) The Contractor shall dispose of excess suitable materials at an acceptable landfill.

5. Safety of Structures
   
   a) The prosecution of work shall ensure the stability of piers, bulkheads, and other structures lying on or adjacent to the site of the work, insofar as structures may be jeopardized by dredging operations.
   
   b) Repair damage resulting from dredging operations at no cost to the Government.

6. Turbidity Barrier
   
   a) The Contractor shall install a turbidity barrier to protect open water prior to commencing with clearing and grubbing. Turbidity barrier shall meet the requirements of Section, “Temporary Erosion and Sediment Control”.

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Partners Point Seawall – L14PD01347 31 23 00 - 11
b) Location of the barrier shall be according to the approved SWPPP. Location shall be moved as necessary during the operation.

c) If turbidity in open water becomes a problem, an additional barrier may be required.

d) The contractor shall maintain the barrier during dredging operations.

e) The barrier shall be removed upon completion of dredging operations and on the approval of the Contracting Officer.

7. Survey

a) Pre Dredge Survey: After dredge plant is on site, a Pre Dredge survey shall be performed over the contract area as close to the start of dredging as possible; generally within 14 days prior to commencement of work in the reach to be dredged. Plots of Pre Dredge surveys and related quantities requiring excavation are required within two (2) days of completion of the surveys.

b) After Dredge and Acceptance Surveys

1) After Dredge surveys shall be performed as soon as possible after dredging in a reach or acceptance section is completed; generally within five (5) days or less.

2) Final survey plots and quantity computations are required within two (2) days of the survey.

c) Following the first After Dredge Survey, the Contractor may re-perform the After Dredge survey once within the scope of this contract in order to determine final dredge depth, lateral extents and elevations. Subsequent After Dredge surveys shall be re-performed at the Contractor’s expense until dredge depth, lateral extents and elevations shown on the drawings are achieved.

3.10 GRAVEL MULCH CONSTRUCTION

A. The area designated to receive gravel mulch shall be prepared by scarifying to provide a roughened surface so that the gravel mulch will stay in place.

B. Rocks, trash, weeds, and other debris that will interfere with gravel placement shall be removed or disposed of as determined by the Contracting Officer.

C. Where shown on the drawings, filter fabric shall be placed and anchored prior to placement of gravel.

D. The gravel mulch shall be placed by equipment on the prepared surfaces. The mulch shall be constructed to the full course thickness in one operation and in such a manner as to avoid serious displacement of the underlying materials. The gravel mulch shall be delivered and placed in a manner that will ensure that the in-place mulch layer shall be reasonably homogeneous and the fractions uniformly distributed. Hand placing of gravel cover shall be required to the extent necessary to prevent damage to the permanent works. The average thickness of the gravel mulch shall be 2 inches and shall be applied at an average of 150 pounds per square yard. In no case shall the thickness of the gravel mulch layer be less than 1.5 inches.

E. The gravel mulch will be hand raked and smoothed prior to water spray settling. The application of a uniform spray of water will be made at a rate not exceeding the infiltration rate to minimize run off.
3.11 FINISH OPERATIONS

A. Grading: Finish grades as indicated within one-tenth of one foot. Grade areas to drain water away from structures. Maintain areas free of trash and debris. For existing grades that will remain but which were disturbed by Contractor's operations, grade as directed.

B. Protection of Surfaces: Protect newly backfilled, graded, and topsoiled areas from traffic, erosion, and settlements that may occur. Repair or reestablish damaged grades, elevations, or slopes.

3.12 DISPOSITION OF SURPLUS MATERIAL

A. Remove from Government property surplus or other soil material not required or suitable for filling or backfilling, and brush, refuse, stumps, roots, and timber.

3.13 FIELD QUALITY CONTROL

A. Testing shall be conducted in the presence of the Contracting Officer who shall be given notice 48 hours before any test is to be conducted.

B. Arrange for a certified, independent testing laboratory, according to the requirements of Section 01 45 29 - Testing Laboratory Services, to perform the required testing, recording, and distributing of the results.

C. Take the number and size of samples required to perform the following tests.

D. Perform one of each of the following tests for each material used. Provide additional tests for each source change.

8. Fill and Backfill Material Testing:
   a. ASTM C136 for conformance to ASTM D2487 gradation limits;
   b. ASTM D1140 for material finer than the 75 micrometers No. 200 sieve;
   c. ASTM D4318 for liquid limit and for plastic limit;
   d. ASTM D698 or ASTM D1557 as indicated for moisture density relations, as applicable.

9. Density Tests:
   a. Perform density tests according to ASTM D1556 (Sand Cone) and ASTM D6938 (Nuclear).
   b. When ASTM D6938 density tests are used, verify density test results by performing an ASTM D1556 density test at a location already ASTM D6938 tested as specified herein.
   c. Perform an ASTM D1556 density test at the start of the job, and for every 10 ASTM D6938 density tests thereafter.
   d. Testing frequency shall be per SECTION 01 40 00 – QUALITY REQUIREMENTS
   e. Test each lift at randomly selected locations.
   f. Include density test results in daily report.

END OF SECTION 31 23 00
SECTION 31 50 00 – EXCAVATION AND SUPPORT PROTECTION

SECTION 31 51 00 – ANCHOR TIEBACKS

PART 1: GENERAL

1.1 SUMMARY

A. Section Includes: Furnishing the labor, equipment and materials to install steel sheet pile tie-back anchors with rods as shown in the drawings.

1.2 SUBMITTALS

A. General: Submittals shall be according to Section 01 33 00 - Submittal Procedures.

B. Material Certificates: Submit three copies. For each shipment, submit certificates identified with specific lots prior to installation. Include in the identification data - type, dimensions, chemical composition, mechanical properties, section at number, and mill identification mark.

C. Shop and Installation Drawings: Submit three copies of shop and installation drawings of structural steel connections and installations for approval.

1. Using AWS welding symbols show size, length, and type of each weld.

2. Errors in dimensions shown on shop drawings shall be the responsibility of the Contractor.

3. Fabricating of material, prior to approval shall be at the risk of the Contractor.

4. Provide details of the method and sequence for installation, tightening and adjustment of turn buckles.

D. Asphalt Emulsions/Wrappings: Submit three copies of the coating material product specifications used on the steel members.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Fabricated steel shall be carefully loaded and unloaded from transport vehicles to preserve structural integrity. Inspect steel on delivery to ascertain freedom from damage during transport and unloading procedures.

1.4 COORDINATION

A. Careful coordination by the Contractor shall ensure proper fit and alignment between steel sheetpiles, walers, tie-back anchor rods, and other steel specified within this Section.
PART 2: PRODUCTS

2.1 MATERIALS

A. Steel shapes, Plates, Bars and Rods: ASTM A 588 or A307 Grade A.

B. Fasteners and Anchors: ASTM A 325.

C. Steel Rods for Concrete Tie-Back Anchors: Rods shall be A307, Grade A steel rod. The sheetpile end of the steel rod shall have a minimum of four (4) inches of threads and both the rod and extension rods at the anchor where they connect with the turnbuckle shall have a minimum of six (6) inches of threads.

D. Concrete: Concrete mix for anchor block shall be Class AA, Sulfate-resistant, in accordance with the requirements of Section 03 31 00 Structural Concrete. All materials and admixtures used in the concrete mix, steel reinforcement and for curing shall be in accordance with the requirements of Section 03 31 00. Steel reinforcement shall be grade 60.

E. Sand bedding: Sand bedding material shall be in accordance with Section 31 23 0.

2.2 FABRICATION

A. Structural Steel: Fabricate structural steel in accordance with the applicable requirements of the International Building Code, 2015 edition (or current edition).

B. Punch and drill steel as specified for attachment of other materials thereto.

PART 3: EXECUTION

3.1 INSTALLATION

A. Surface Conditions: Examine the areas and conditions under which work of this section will be performed. Verify elevations of bearing surfaces and locations of anchorages. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

B. Concrete Anchor and Tie-Back Rod System: Set concrete anchors and tie back rods at intervals shown on the drawings, backfill and thoroughly compact around each anchor.

C. Anchor Blocks:

1. Each anchor block shall be a monolithic pour.

2. Concrete anchor blocks shall be formed, poured and cured in accordance with Section 03 31 00.

3. Anchor blocks shall have a Class I finish.

4. Concrete shall be cured for a minimum of seven days before backfilling.

5. Field quality control shall be in accordance with Section 03 31 00, subsection 3.5.
6. Concrete shall be inspected for cracking or other deficiencies before covering with fill. Concrete found to be cracked or deficient shall be repaired or replaced at the Contractor’s expense.

D. Cutting:

1. Do not use cutting torch for field correction of fabrication, without written approval from Contracting Officer.

E. Walers and tie rods:

1. Install anchor bolts, rods, and plates in accordance with manufacturer’s recommendations. All connections shall be by mechanical means. No welding to members will be allowed.

2. Double-coat/wrap all surfaces with asphalt emulsion or rubberized liquid solutions to minimize rusting. Coat or wrap each part thoroughly and completely. Allow liquid coats to thoroughly dry between coatings.

3. Hand-fill around members with sand before backfilling to avoid scraping or removing the coatings or wrappings. Those members that have been scratched or wrappings cut or removed shall be re-coated or re-wrapped.

4. Backfill cover to a minimum of 8-inches by hand before using equipment. Keep rocks that may remove or scratch the coverings out of the backfill or around members.

END OF SECTION 31 51 00
SECTION 31 60 00 – SPECIAL FOUNDATIONS AND LOAD-BEARING ELEMENTS

SECTION 31 62 00 - DRIVEN PILES

PART 1: GENERAL

1.1 SUMMARY

A. Section Includes: Furnish labor, equipment and materials to install segmental, interlocking steel sheet piles of lengths shown on the drawings.

1.2 SUBMITTALS

A. Work Plan: Submit a plan describing the proposed installation method, and schedule including the type of equipment and temporary work to be accomplished in preparation for pile driving, layout and installation of the sheet piling, installation of the walers and tie back anchors, dewatering and backfill and finishing the pile wall. Plan shall include details of installation method proposed from land or water.

B. Equipment Literature: Submit three copies of complete descriptions of the pile driving equipment to be used on this project. Include details of the pile hammer, power plant, cap block or hammer cushion, pile cap, pile cushion, leads, piles and other installation appurtenances.

1. Pile Hammers shall be steam, air, or diesel drop, single-acting, double-acting, differential-acting, or vibratory type. The driving energy of the hammers shall be as recommended by the manufacturer for the piling weights and subsurface materials to be encountered.

C. Certificates of Conformance: Submit three copies of written certification from the supplier of the sheet piles to be used on this project that they conform to the requirements of this specification section.

D. Material Certificates: Submit three copies. For each shipment, submit certificates identified with specific lots prior to installing piling. Include in the identification data piling type, dimensions, chemical composition, mechanical properties, section at number, and mill identification mark.

E. Product Literature: Submit three copies of the sheet pile manufacturer’s product literature (product data sheets, specification sheets, etc…) for the sheet piles to be used on this project.

F. Shop Drawings: Submit three copies of detail drawings for sheet piling, including fabricated sections, showing complete piling dimensions and details, sheet pile layout, driving sequence and location of installed piling. Include in the drawings details of top protection, special reinforcing tips, tip protection, lagging, splices, corner piles, connectors, fabricated additions to plain piles, cut-off method, corrosion protection, and dimensions of templates and other temporary guide structures for installing piling. Provide details of the method for handling piling to prevent permanent deflection, distortion or damage to piling interlocks.

G. Closeout Submittals: Submit three copies of the pile driving records.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Materials delivered to the site shall be new, undamaged and accompanied by certified test reports.

B. Storage: Storage of sheet piling shall facilitate required inspection activities.
C. Handling: Use handling holes. Handle long length piles with care to prevent permanent deflection, distortion, or damage to the interlocking tabs. Contractor shall be responsible for off-loading of materials at work site. Prevent damage to coatings and prevent corrosion prior to, during and after installation.

1.4 QUALITY ASSURANCE

A. Welding shall be performed according to applicable portions of the AWS Handbook(s), 9th Edition.

PART 2: PRODUCTS

2.1 MATERIALS

A. Sheet Piles: Steel sheet piles shall be Z-sections (AZ, PZ, NZ) meeting the structural requirements shown on the drawings. Steel sheet pile sections shall be hot-rolled steel sections conforming to ASTM A 572 Grade 50 & 60, or A 690 interlocking sheet piles. Sheet piles shall be free-sliding, provide a swing angle suitable for the intended installation but not less than 5 degrees when interlocked, and maintain continuous interlocking throughout the length when installed. Sheet piles shall be full-length sections of the dimensions shown and shall have ends that are square and blunt, as received from the mill, or squarely cut.

B. ‘C’ Channel Walers: Steel, one-piece 20 or 21 foot lengths, American Standard 8 x 13.75, ASTM A588, corrosion resistant, high strength low alloy steel with a minimum yield strength of 50 ksi.

C. Tie Back Anchors: Refer to Section 31 51 00 Anchor Tiebacks and 03 31 00 Structural Concrete.

D. Tie Back Rods and Turnbuckles: Refer to Section 31 51 00 Anchor Tiebacks.

E. Steel plates: ASTM A 588 or A307 Grade A.

PART 3: EXECUTION

3.1 INSTALLATION

A. Pile Protection: Use a protective cap during driving to prevent damage to the top of the sheet piling.

B. Remove and replace pilings damaged during driving or piles driven out of interlock or improperly installed piles at the Contractor's expense.

C. Placing: Temporary wales, templates, or guide structures suitable for aligning, supporting, and maintaining sheet piling in the correct position during setting and driving shall be provided to ensure that the pilings are placed and driven to the correct alignment. At least two templates shall be used in placing each piling and the maximum spacing of the templates shall not exceed 20 feet. The templates shall be sufficiently rigid to resist lateral and driving forces without movement and shall adequately support the pilings until design tip elevation is achieved. Pilings properly placed and driven shall be interlocked throughout their length with adjacent pilings to form a continuous diaphragm throughout the length of run of piling wall.

D. Driving: Sheet piling shall be driven with the proper sized hammer and by approved methods so as not to subject the pilings to damage and to ensure proper interlocking throughout their length. Driving hammers shall be maintained in proper alignment during driving operations by use of leads or guides attached to the hammer. Adequate precautions shall be taken to ensure that the pilings are driven plumb. Individual pilings shall be driven in sequential order in increments of depth to the required elevation or depth. Pilings shall be
driven without the aid of a water jet. Ensure that there is no binding or torque on the interlocking knuckles while driving the piles into place where this would impede the vertical or horizontal placement.

E. Layout: From starting point of pile sections, use full sheet widths to the angle point or corners where wall makes a bend or change in direction towards the shoreline. Make the change in directions using the manufacturers approved connectors and corner piles. If the specified length shown on the drawings or the actual layout distance causes the corners or change in direction to fall anyplace other than a full sheet pile section, round the distance up or down to a length that uses the full sheet pile section but does not decrease the length of the waterfront edge of dock to less than 115 feet.

F. Connections/Splices: Sheet piles driven below the finished top elevation and sheet piles damaged by driving and cut off to permit further driving shall be extended at no additional cost to the Government. Pilings adjoining spliced pilings shall be full length unless otherwise approved. Ends of pilings to be spliced shall be squared before splicing to eliminate dips or camber. Pile splices needed to effectively lengthen the pile section shall be welded together and the weld shall develop the full strength of the pile, to the satisfaction of the Contracting Officer. Pilings shall be spliced with concentric alignment of the interlocks so that there are no discontinuities, dips or camber at the abutting interlocks. Spliced pilings shall be free-sliding and able to obtain the maximum swing with contiguous pilings. The tops of pilings excessively damaged during driving shall be trimmed to a level, flush edge to match adjacent piles at no cost to the Government.

G. Cutoffs: Piling cut-offs shall become the property of the Contractor and shall be removed from the site.

H. Holes: Holes cut in the pilings for bolts, rods, or weep holes shall be done in a neat and workmanlike manner and of the minimum size necessary. Holes in the piling shall be drilled or may be burned and reamed by approved methods which will not damage the surrounding steel.

I. Sheet Pile Channel Walers: Channel flanges shall be set flush up against the back of the sheet piles and welded end to end. Channels shall have holes drilled in both flanges to accommodate bolts. Place the channels flat up against the back of the sheet piles and level at the elevation shown on the drawings. Align the holes so they fall at the contact flats where the channels and the sheet piles meet. Drill matching holes into the sheet piles so bolts can be positioned, one on each end of the sheet pile section between the connecting knuckles and the first bend as shown on the drawings. Insert the bolts with the bolt head on the outside or lake side of the sheet pile and the nut and washer on the back side flange of the channels. Tighten the bolts with the minimum required foot-pounds of torque. Weld a 3/8-inch flat steel web stiffener each side of the two bolts at every bolted sheet pile as shown on the drawings. Ensure that the holes in the channel flanges align within the spaces between the pile connection knuckle and the first bend of the sheet pile. After walers have been installed coat nuts, bolts and washers with two coats of elastomeric or asphaltic emulsions to minimize corrosion.

J. Welding: Shop and field welding, qualification of welding procedures, welders, and welding operators shall be according to AWS D 1.1, for the type of welding required. Use only E70XX rods for all welds. After welds have been made apply two coats to all welded surfaces of a waterproofing elastomeric or asphaltic emulsion to protect and give longevity to the weld.

K. Cutoffs: Sheet piles driven to refusal or to the point where additional penetration cannot be attained and extending above the required top elevation shall be cut off to the required elevation. The cutoffs shall be made in clean, straight lines and within the stated tolerances.
L.  Inspection: Any sheet piling found to be damaged to the extent that its usefulness is impaired or found to be interlocked incorrectly shall be removed and replaced at the Contractor’s expense.

M.  Tie Back Anchor Installation: Install the tie-back anchors as shown on the drawings carefully locating the proper elevations for the connecting rods, both at the tie-back and where they connect to the seawall. After the steel ‘C’ channels have been bolted in place behind the seawall, place the connecting rods between the two channels and perpendicular to the channel and fasten the washer and nut on the threads. After all connections and tightening have been done, coat all metal surfaces with two coats of a waterproofing elastomeric or asphaltic emulsion to prolong the life of the steel. Allow the first coat to completely dry before applying the second. The connecting rod coatings shall extend all the way back to the tie back anchors, including turnbuckles. Backfill around soft coatings with sand to prevent scratching or abrasions on surfaces.

3.2  REMOVAL

A.  Pulling: The method of pulling sheet pilings shall be approved by the Contracting Officer. Pulling holes shall be provided in pilings as required and extractors shall be of suitable type and size. Exercise care in pulling pilings to avoid damaging piling interlocks and adjacent construction. If the Contracting Officer determines that adjacent permanent construction has been damaged during pulling, the Contractor shall repair that construction at no cost to the Government. The pilings shall be pulled one sheet at a time. The Contractor will not be paid for removal of pilings damaged beyond structural use because of improper care employed during pulling.

3.3  FIELD QUALITY CONTROL

A.  Requirements: The Contractor shall maintain a record for each sheet pile. Indicate on the installation record installation dates and time, type and size of hammer, rate of operation, total driving time, dimensions of driving helmet and cap used, blows required per foot for each foot of penetration, final driving resistance in blows for final 6 inches, pile locations, tip elevations, ground elevations, cut-off elevations and re-heading or cutting of piles. Prior to driving pilings in water, paint a horizontal line on both sides of each piling at a fixed distance from the bottom so that it will be visible above the water line after installation. This line shall indicate the profile of the bottom elevation of installed pilings and potential problem areas can be identified by abrupt changes in its elevation. Record unusual behavior during driving. Submit complete records.

B.  Driving Tolerances: Sheet pile shall be driven with a variation from vertically plumb of not more than 1/4 inch per foot. Place the pile so the face shall not be more than 4 inches from vertical alignment at any point. Top of pile at elevation of cut-off shall be within 1/2 inch horizontally and 2 inches vertically of the location indicated. Manipulation of piles to force them into position will not be permitted. Check piles for heave during driving. Re-drive all piles that heave more than 1/4 inch. Re-drive heaved piles to the specified tip elevation.

C.  Structural Capacity: The Contractor shall coordinate with the CO and/or COR for review and acceptance of Contractor’s proposed steel sheeptile cut-off elevations and/or splice locations and methods by the Structural Design Engineer prior to requesting written approval from the Contracting Officer for executing a Contract Modification to include any of the Pre-Priced Contingency Items identified on the Contract Bid Schedule.

END OF SECTION 31 62 00
PART 1 - GENERAL

1.1 SUMMARY

A. This section describes materials and methods for providing and installing the following:

2. Grounding and bonding for chain-link fences

1.2 REFERENCES

ASTM A90 Standard Test Method for Weight [Mass] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings


ASTM A121 - 13 Standard Specification for Metallic-Coated Carbon Steel Barbed Wire

ASTM A392-11a Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric

ASTM A702 - 13 Standard Specification for Steel Fence Posts, Hot Wrought

ASTM A824 - 12 Standard Specification for Metallic-Coated Steel Marcellled Tension Wire for Use With Chain Link Fence

ASTM F567 - 14a Standard Practice for Installation of Chain-Link Fence

ASTM F626 - 14 Standard Specification for Fence Fittings

ASTM F900 - 11 Standard Specification for Industrial and Commercial Steel Swing Gates

ASTM F1043 - 14 Standard Specification for Strength and Protective Coatings on Steel Industrial Fence Framework

ASTM F1083 Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures


1.3 SUBMITTALS

A. Product Data: For each type of product indicated.
B. Shop Drawings: Show dimensions and details of fence installation, locations, components, materials, dimensions, sizes, weights, and finishes of components. Include detailed shop and field fabrication plans including, gate elevations, sections, details of post anchorage, attachment, bracing, cane bolts, and other required installation and operational clearances.

C. Submit reports for chain link fabric, posts, hardware and accessories indicating weight / thickness of zinc coating. Submit reports demonstrating full compliance with the material and installation specifications.

1.4 QUALITY ASSURANCE

A. Single-Source Supplier: The Contractor shall obtain chain link fences and gates, including accessories, fittings, and fastenings, from a single source.

1.5 DELIVERY, STORAGE AND HANDLING

A. Requirements: Deliver materials to the site in an undamaged condition. Store materials off the ground to provide protection against oxidation caused by ground contact.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify layout information for fences and gates shown on the drawings in relation to the property survey and existing structures.

PART 2 - PRODUCTS

2.1 CHAIN-LINK FENCE FABRIC

A. General: Height indicated on Drawings. Comply with ASTM A 392, CLFMI CLF 2445, and requirements indicated below:

1. Steel Wire Fabric: Metallic-coated wire with a diameter of 0.120 inches.
   a. Mesh size: 2 inches.
   b. Metallic (Zinc) Coating: ASTM A 392, Type II.

2. Selvage: Twisted top and knuckled bottom.

2.2 INDUSTRIAL FENCE FRAMING

A. Post and Rails: Comply with ASTM F 1043 for framing, ASTM F 1083 for Group IC round pipe, and the following:


2. Fence Height: As indicated in the drawings.


4. Coating for Steel Framing:
a. Metallic (zinc) coating: ASTM A 392, Type II.

2.3 TENSION WIRE

A. General: Provide horizontal tension wire at top and bottom of fence fabric.

B. Location: Extended along top of extended posts and top of fence fabric for supporting barbed tape.

C. Metallic-Coated Steel Wire: 0.177-inch diameter, marcelled tension wire complying with ASTM A 817 and ASTM A 824.
   1. Metallic Coating: Type III, Zn-5-Al-MM alloy.

2.4 GATE HARDWARE AND ACCESSORIES

A. Provide gate assembly conforming to ASTM F 900 of the type and swing shown on the drawings.
   1. Furnish and install chain link fabric conforming to ASTM A116. Gate fabric shall be as specified for chain link fabric. Attach fabric to the gate frame by method standard with the manufacturer except that welding will not be permitted.
   2. Furnish and install gate posts conforming to ASTM A702 of the sizes shown on the drawings.
   3. Provide gate frames conforming to strength and coating requirements of ASTM F 1083 for Group IA, steel pipe, with external coating metallic (zinc) coating: ASTM A 392, Type II. For gate leaves, more than 8 feet wide, provide either intermediate members and diagonal truss rods or tubular members as necessary to provide rigid construction, free from sag or twist. Each end member of gate frames shall be extended sufficiently above the top member to carry three strands of barbed wire in horizontal alignment with barbed wire strands on the fence.
   4. Furnish and install latches, hinges, stops, keepers, rollers, and other hardware items as required for the operation of the gate. Gate and fence fittings shall conform to ASTM F626. Provide latch that permits operation from either side of the gate, with a padlock eye provided as an integral part of the latch.
   5. Provide manufacturer's standard heavy-duty track ball bearing hanger sheaves, overhead framing and supports, guides, stays, bracing, and accessories as required for easy operation of gate.
   6. Provide stops (cane bolt and sleeve) for holding the gates in the open and closed position.

B. Special requirements
   1. All gates shall be free swinging without wheels.
   2. Gates located on the concrete deck shall be mounted using base plates and anchor bolts as shown on the drawings. Gate posts shall be anchored to the concrete wall with mounting clips as shown on the drawings.
   3. Gate locking post on the concrete deck shall be removable and lockable as shown on the drawings.
   4. Single swing gate at the top of the access ramp shall swing fully (180 degrees) open per the plans to allow vehicle access past the ramp.
2.5  BARBED WIRE

A. Zinc-Coated Steel Barbed Wire: Comply with ASTM A 121; 2-point round barbs spaced not more than 4 inches on center.

2.6  FENCE GROUNDING

A. Comply with the requirements for grounding fence and gates as specified in Division 33 and in accordance with the current edition of the National Electric Code.

B. Connectors and Grounding Rods: Comply with UL 467 and with the grounding requirements of Division 33 and in accordance with the current edition of the National Electric Code.

2.7  CONCRETE

A. Concrete for setting posts in ground shall be Class B or stronger per Section 03 31 00.

PART 3 - EXECUTION

3.1  GENERAL

A. Contractor shall construct the fence based on site specific design drawings when provided. Installation methods for support posts provided in paragraph 3.2 assume the soil is undisturbed and does not provide methods for installation in rocky soil conditions.

3.2  INSTALLATION

A. General: Install chain-link fencing to comply with ASTM F 567 and more stringent requirements specified.

B. Post Excavation: Drill or hand-excavate a hole for each post in firm, undisturbed soil.

C. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.

1. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete spatter.

2. Posts Installed in Concrete Structures: Install sleeve in the structure prior to pouring concrete. Alternatively, core drill for the posts. Do not cut through rebar. Grout the post as indicated on the drawings.

D. Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment.

E. Line Posts: Space line posts uniformly at a maximum of 10 feet on center.

F. Post Bracing and Intermediate Rails: Install according to ASTM F 567. Install braces at end and gate posts and at both sides of corner and pull posts.

G. Tension Wire: Install according to ASTM F 567, maintaining plumb position and alignment of fencing.
H. Top Rail: Install according to ASTM F 567.

I. Bottom Rails: Install spanning between posts.

J. Chain-Link Fabric: Apply fabric to outside of enclosing framework. Leave 2 inches between finish grade or surface and bottom selvage, unless otherwise indicated.

K. Tie Wires: Attach wire per ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.

L. Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

M. Barbed Wire: Uniformly spaced, angled toward outside of enclosed area. Pull wire taut, install securely to extension arms, and secure to end post or terminal arms.

3.3 GATE INSTALLATION

A. Install gates according to manufacturer’s written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

3.4 GROUNDING AND BONDING

A. All chain-link fencing permanently installed with this contract, including barbed-wire strands installed above top of chain-link fence, permanently installed in conjunction with this contract shall be electrically grounded. (A future project will install a telecommunications tower in very close proximity to the fence which will require additional grounding for the segments of existing fence to be installed in the future by others.)

B. Fence Grounding: Comply with the requirements for grounding fence and gates as described herein, in Division 33 and in accordance with the current edition of the NEC.

C. Ground all metal fences at or near points 150 feet on each side of medium and high-voltage, (meaning in excess of 600 volts) overhead line crossings. Ground metal fences at 150 foot intervals where high and medium voltage lines are directly overhead and run parallel to the fence.

   1. Metal fences that are electrically continuous with metal posts extending at least 2 feet into the ground require no additional grounding. (metal fences with no gates)

D. Metal fences that are not electrically continuous shall be grounded on each side of every gate at each gate post, at corner posts, and at end posts. Bond gates to their adjacent fence posts utilizing flexible copper grounding braid with sufficient slack to permit opening of the gate as designed to operate. Provide flexible copper ground braid which has ampacity equivalent to that of the fence ground wire. Provide ground rods or grounding plates every 1000 to 1500 feet for grounding fences when fences are located in isolated places, and every 500 to 750 feet when in proximity (100 feet or less) to public roads, highways, and buildings. Provide connection to ground from the post where it is metal and is electrically continuous with the fencing using removable ground clamps on the fence posts and split-bolt connectors suitable for dissimilar metals on the fence fabric and barbed wire. Make connections to ground from the horizontal metal strand using split-bolt connectors suitable for dissimilar metals on the fence fabric and barbed wire.
E. Figure 9 represents a typical construction example for fence grounding and bonding.

![TYPICAL DETAIL
FOR INFORMATION PURPOSES ONLY, NOT FOR CONSTRUCTION]

END OF SECTION 32 31 13
PART 1: GENERAL

1.1 SUMMARY

A. Section Includes: Provide all labor, materials and equipment to install a cast in place concrete retaining wall.

B. Retaining wall (vertical sections only) visible surfaces shall be constructed with an exposed aggregate finish.

C. If ordered in writing by the Contracting Officer, retaining wall (vertical sections only) shall be constructed with integrally colored concrete. Contractor shall provide color palette or sample of available colors matching that of the BLM standard environmental color CARLSBAD CANYON (June 2013). Color selection shall be approved by the Contracting Officer prior to ordering job concrete.

1.2 SUBMITTALS

A. Manufacturers/Suppliers Data: Submit 3 copies of the manufacturers/suppliers descriptive data appropriately marked to indicate proposed concrete mix strength, each additive, aggregates, color stain, reinforcement to be used on this project. Include test data for concrete strength by independent testing company.

B. Submit product data for waterproofing membrane, primer and wall drains.

C. Submit samples of pigments for integrally colored concrete.

D. Mock Up for color approval, if ordered in writing by the Contracting Officer.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project Site in an undamaged condition.

B. Store and handle materials to prevent deterioration or damage due to moisture, temperature changes, contaminants, corrosion, breaking, chipping, or other causes.

C. Store accessories, including metal items, in a manner to prevent corrosion and accumulation of dirt and oil.

1.4 QUALITY ASSURANCE

A. Concrete for all components of the retaining walls shall be of the same type, mix and compressive strength.

B. Mockups: If the Addition of colored concrete is incorporated into the Contract at Time of Award or ordered in writing by the Contracting Officer according to Pre-Priced Contingency Items: Before casting architectural concrete, build mockups to verify selections made under sample submittals and to demonstrate typical joints, surface finish, texture, integral color, tolerances, and standard of workmanship. Build mockups to comply with the following requirements, using materials indicated for the completed Work:

1. Build vertical mockup wall panels minimum of 16 sq. feet each.

2. Base condition: One (1) Panel shall have exposed aggregate finish and concrete color shall be natural.
3. Integrally Colored Concrete Additive Item: Include in the cost for the Additive Item: Two (2) Panels shall have exposed aggregate finish and integral color for each will be determined at the time the Contractor incorporates the Additive Item into the Contract in writing.

B. Construct mockup panels in location indicated by the Contracting Officer. Contractor shall retain and protect approved panels for reference during construction. Approved mockup shall be used as the standard of comparison in COR’s determination of acceptability of concrete wall surface finish. If directed by the Contracting Officer, approved panels may become part of the completed Work if undisturbed at time of Final Inspection.

1. Dispose of mock ups by recycling concrete at local accepting facility after CO provides written approval for removal of Temporary Facilities and Controls and after passing Final Inspection.

PART 2: PRODUCTS

2.1 MATERIALS

A. Concrete: Concrete mix for walls shall be Class A, 3000 psi, Sulfate-resistant, in accordance with the requirements of Section 03 31 00 Structural Concrete. Concrete mix for the “L” Wall footing shall be the same mix as for the concrete deck. All materials and admixtures used in the concrete mix shall be in accordance with the requirements of Section 03 31 00.

1. Surface retarder for exposed aggregate finish shall be Grace PIERI Duro-Tard, or an equal “in-form” surface retarder.

2. If ordered in writing by the Contracting Officer, add color to concrete mixture according to manufacturer's written instructions to result in hardened concrete with integral color consistent with approved samples.

B. Aggregate Base Course: Conform to requirements of Section 31 23 00.

C. Reinforcing Steel: Reinforcing shall conform to the requirements of Section 03 31 00.

D. Membrane Curing Compound: Liquid membrane forming compound shall conform to the requirements of Section 03 31 00.

E. Forming Material: Forming materials shall conform to the requirements of Section 03 31 00.

F. Weep Holes

1. Pipe may be cast iron, ductile iron or PVC.

2. Screen shall be galvanized or stainless steel woven or welded wire mesh, 1/2 inch maximum mesh opening and with minimum wire diameter of 0.04 inch.

G. Fluid Applied Waterproofing Membrane

1. Shall meet the requirements of ASTM C836.

2. Membrane primer shall be as recommended by the fluid-applied membrane manufacturer unless specifically prohibited by the manufacturer of the fluid-applied membrane.
H. Concrete Color, if ordered in writing by the Contracting Officer
   1. Pigment: ASTM C 979, synthetic mineral-oxide pigments or colored water-reducing admixtures; color-stable, free of carbon black, nonfading, and resistant to lime and other alkalis.
   2. Color: According to approved mock-up

I. Wall Drain
   1. Prefabricated wall sheet drain is for use where high compressive strength and high flow capacity are required on vertical retaining walls and foundation walls. The design shall prevent soil intrusion into the core while allowing water to freely enter. It shall provide an uninterrupted path for water to flow to designated drainage exits.
   2. Sheet drain shall be manufactured composite subsurface drainage panels consisting of a nonwoven, needle-punched geotextile facing bonded to one side of a studded, nonbiodegradable, molded-plastic-sheet drainage core.
   3. Geotextile shall have an apparent opening size not exceeding No. 80 per ASTM D4751. Puncture resistance shall be a minimum of 300 pounds per ASTM D6241. Survivability shall be Class 3 per AASHTO M288
   4. Drainage core shall have a minimum vertical flow rate of 10 gallons per minute per linear foot. Compressive strength shall be 10,000 psf or greater per ASTM D1621.

PART 3: EXECUTION

3.1 PREPARATION

A. Subgrade: Each subgrade upon which concrete or aggregate base course material are placed shall be firm and free from water. Subgrade shall be scarified to a depth of 8 inches and mechanically compacted to 95 percent maximum dry density and tested for compaction by a certified testing company. Ground water shall be kept several inches below subgrade until the concrete has set. When the subgrade is in dry earth, it shall be moistened with water from a spray nozzle immediately before concrete is placed.

B. Aggregate Base: Aggregate base shall be placed under footings as shown on the drawings, prior to installing formwork in accordance with the requirements in Section 31 23 00. Place base course in 6-inch maximum lifts and compact each lift. Base shall be mechanically compacted to 95 percent and tested for compaction by a certified testing company. Base course shall extend out past the edges of the base form a minimum of 8 inches on all sides.

C. Forms: Form design and construction shall conform to the requirements of Section 03 31 00 Subsection 3.1.C. Inspection shall conform to the requirements of Section 03 31 00 Subsection 3.1.D.

D. Construction Joints: Construction joints shall conform to requirements of Section 03 31 00 Subsection 3.1.E.

E. Placing Reinforcement: Reinforcement shall conform to requirements of Section 03 31 00 Subsection 3.1.F.

3.2 CONCRETE PLACEMENT

A. Concrete mixing shall be in accordance with Section 03 31 00.
B. Concrete placement and consolidation shall conform to the requirements of Section 03 31 00.

C. Weather limitations and procedures for placement shall conform to the requirements of Section 03 31 00.

D. Hot weather limitations and procedures for placement shall conform to the requirements of Section 03 31 00.

E. Cold weather limitations and procedures for placement shall conform to requirements of Section 03 31 00.

3.3 CONCRETE FINISHING

A. Exposed Aggregate Finish: Concrete retaining wall shall have an exposed aggregate finish which shall be obtained by applying an even coat of retardant to face of form, removing forms after concrete hardens, and exposing coarse aggregate to a depth of 1/4 inch by washing, brushing or lightly sandblasting away surface mortar.

B. Form Removal: Formwork not supporting concrete, may be removed after curing of 3-days at not less than 50 degrees Fahrenheit for 24 hours after placing concrete, and when curing and protection procedures are followed as specified or the concrete shall be High-Early or of stronger PSI mix sufficiently hard so as not to be damaged by form removal.

C. Concrete Finish Patching: Finish patching shall match the color and texture of the wall and shall be field-approved by the CO.

D. Joint Sealing: Use compressed air to blow dirt and dust from joints to be sealed. When joints are dry and dust-free, apply sealant in the joints according to the manufacturer's instructions. The finished joints shall have no depressions or protrusions and continuous seals shall be formed along the joints.

3.4 CONCRETE CURING

A. Concrete walls shall be cured in accordance with the requirements of Section 03 31 00.

3.5 PROTECTION

A. Protect the structure in accordance with the requirements of Section 03 31 00.

B. Waterproofing

   a. Apply waterproofing coating to the back side of the wall.

   b. Clean and prepare substrate according to manufacturer's written recommendations.

   c. Provide clean, dust-free, and dry substrate for waterproofing application.

   d. Apply primer as required by membrane manufacturer's printed instructions.

   e. Mask off adjoining surfaces not receiving waterproofing to prevent spillage or overspray affecting other construction.

   f. Provide a uniform, wet, monolithic coating of fluid-applied membrane, 60 mils thick, plus or minus 5 mils by following manufacturer's printed instructions.

   g. Apply from finished-grade line to top of footing, extend over top of footing, and down a minimum of 6 inches over outside face of footing.

   h. Do not extend onto surfaces exposed to view when Project is completed.
C. Wall Drain

a. Place and secure molded-sheet drainage panels, with geotextile facing away from wall or deck substrate, according to manufacturer's written instructions.

b. Panels shall be placed for the entire length of the wall and shall extend from 6 inches below finished grade down to the weep holes.

c. Use adhesives or mechanical fasteners that do not penetrate waterproofing.

d. Lap edges and ends of geotextile fabric to maintain continuity.

e. Protect installed molded-sheet drainage panels during subsequent construction.

3.6 FILL PLACEMENT

A. Preparation for Structure Backfill: Prior to the placement of structure backfill, remove all loose, unstable materials from the sides of the structure excavation that may constitute a safety concern or impact proposed backfill operations. Then compact the bottom of the remaining open structure excavation to a uniform density of not less than 95 percent maximum dry density. With the approval of the compaction of the bottom of the open structure excavation by the Contracting Officer, start the placement of the Structure Backfill.

B. Structure Backfill for Earth Retaining Structures: Structure Backfill to be placed against concrete structures designed to retain earth loads, such as retaining walls:

1. Shall conform to the material, gradation, subgrade preparation and placement requirements in accordance with Section 31 23 00.

2. Backfill material shall be Structural Fill Material in accordance with Section 31 23 0.

3. Pervious material shall be placed along the back side of the wall per the dimensions and limits shown on the plans. Material may be Grade 1 (preferred), 2 or 3 in accordance with Section 31 23 00.

4. Fill shall not be placed until the concrete has reached its full design strength and in no case less than 7 days.

5. Fill shall be placed in layers not more than 8 inches in depth before compaction, when compacted by pneumatic or mechanical tamping devices. Thinner layers may be required if required compaction cannot be achieved.

6. Fill shall be uniformly compacted to at least 95 percent of maximum density.

7. Heavy equipment for spreading and compacting backfill shall not be operated closer to foundation or retaining walls than a distance equal to the height of backfill above the top of footing. Use only hand-operated compaction equipment within 3 feet of wall.

3.7 CONSTRUCTION TOLERANCES

A. Wall Batter: within 2 degrees of design batter.

B. Horizontal Alignment: +/- 1.0 inches over any 10-foot distance.

C. Vertical Alignment: +/- 0.4 inches variation from plumb over any 10-foot distance.
D. Variation in footing cross-sectional dimensions: +2.0 / -0.5 inches.

E. Wall thickness: + / - 0.25 inch

3.8 FIELD QUALITY CONTROL

A. Comply with Section 01 40 00 – QUALITY REQUIREMENTS including paragraph, “Section 01 45 29 – Testing Laboratory Services”.

B. Comply with Section 03 31 00 – STRUCTURAL CONCRETE for Field Quality Control during construction of Retaining Wall and Footings.

END OF SECTION 32 32 13
SECTION 33 79 00 – SITE GROUNDING

SECTION 33 79 13 – SITE IMPROVEMENTS GROUNDING

PART 1: GENERAL

1.1 SUMMARY

A. This specification covers general requirements for bonding metallic objects that are designed into a facility or compound.

B. The objective of bonding metallic objects is to equalize the potential between conductive parts. This is done for personnel safety and to prevent arcing between metallic components that might otherwise be at different potentials. Bonding conductors shall be as short and straight as possible.

C. New chain link fence shall be electrically grounded to earth. (A future project will install a telecommunications tower in very close proximity to the fence which will require additional grounding for the segments of existing fence to be installed in the future by others.)

1.2 RELATED SECTIONS

A. Section 33 79 83 – External Ancillary Grounding Conductors

B. Section 33 79 86 – Ground Bus Bars

1.3 REFERENCES

A. Underwriter Laboratories, Inc. (UL)

1. UL 467 – grounding and bonding equipment


1. Article 100 – Definitions
2. Article 110.14 – Electrical Connections
3. Article 200.6 – Means of Identifying Grounded Conductors
4. Article 250.8 – Connections of Grounding and Bonding Equipment
5. Article 250.12 – Clean Surfaces
6. Article 250.62 – Grounding Electrode Conductor Material
7. Article 250.64 (B) – Securing and Protection against Physical Damage
8. Article 250.64 (C) – Continuous
9. Article 250.64 (E) – Enclosures for Grounding Electrode Conductors
PART 2: PRODUCTS

2.1 MATERIALS

A. Grounding conductors shall meet the requirements specified in Section 33 79 83 - External Ancillary Device Grounding Conductors.

PART 3: EXECUTION

3.1 GENERAL

A. Comply with Section, “Chain-Link Fences and Gates”.

B. Grounding conductors shall be installed in one continuous length without a splice or joint, unless spliced using listed (UL 467 or equivalent) irreversible, high-compression-type crimp connector or by exothermic welding connection.

C. Belowground grounding conductors shall be routed at the same depth as the grounding electrodes where practical (typically, 30 inches below grade level).

3.2 GENERAL ANCILLARY DEVICE GROUNDING

A. In high lightning prone geographical areas, or areas of high soil resistivity, it is recommended to bond all metallic objects that are located within ten feet of the external grounding electrode system, or within ten feet of a grounded metallic item.

C. Metallic objects requiring bonding include, but are not limited to, the items listed below.

1. Fences
2. Fence posts
3. Fence gates

D. The series or daisy chain method, which refers to any method of connection whereby the conductors are connected from one peripheral device to a second and possibly on to a third device in a series arrangement whereby the removal of the second connection point interrupts the ground path from the first device, shall not be used.

3.3 GENERAL ANCILLARY DEVICE AND BONDING connections

A. Bonding to the metallic ancillary devices shall be made as allowed by the device manufacturer.

B. Permitted Bonding Methods: Equipment grounding conductors, grounding electrode conductors, and bonding jumpers shall be connected to ancillary devices and electrical equipment by one of the following means:

1. Exothermic Welding
Observe the following prerequisites for exothermic welding:

a. Follow the component manufacturer's recommendations.

b. Use the proper molds for the conductors being welded.

c. Use the proper weld material for the metals being welded.

d. Properly clean all metal parts prior to welding.

e. Properly dry all metal parts and molds prior to welding.

2. Irreversible High-Compression Fittings

Always use the compression tool recommended by the component manufacturer when using irreversible high-compression fittings. Use tool in accordance with the instructions provided by the manufacturer. Use fittings made of the same material as the materials being bonded to avoid dissimilar metal reactions.

a. Use fittings properly sized for the conductors being bonded.

b. Use fittings and compression tools rated at 12 tons of force.

b. Use only listed (UL 467 or equivalent) connectors.

d. To ensure good contact, clean conductors using a wire brush before crimping.

e. Coat all crimped connections with a listed conductive antioxidant compound before crimping.

3. Listed, Labeled, or Approved Components: Where fittings, devices, or other components required by this standard are available as listed or labeled, such components shall be used.

a. Connectors and fittings used shall be listed for the purpose, for the type of conductor, for the size and quantity of conductors being bonded.

b. Mechanical connections shall be coated with a listed conductive antioxidant compound. The antioxidant compound shall be liberally applied between the two metals.

c. Two-hole, connectors are preferred over single-hole connectors.

d. Hardware: Two-hole and single-hole connections to devices shall be made using through-bolted ¼-inch or larger diameter stainless-steel hardware including bolts, nuts and star washers where device manufacturer provided grounding connections or specified methods are not provided.

e. Nonconductive coatings (such as paint, lacquer, and enamel) on equipment to be grounded shall be removed from threads and other contact surfaces to ensure electrical continuity.

C. Specific Installation application:

1. Below-grade grounding connections to ground rods, other grounding electrodes and connections between grounding conductors shall be joined using exothermic welding or listed irreversible high-compression
2. Above grade grounding connections to fence posts shall be joined using exothermic welding, or listed irreversible high-compression fittings compressed to a minimum of 12 tons of pressure.

3. Above grade bonding connections (such as bonding to ancillary equipment or bonding coaxial ground kits to bus bars) shall be joined using exothermic welding or listed irreversible high-compression fittings compressed to a minimum of 12 tons of pressure or other listed means required by the specific component manufacturer.

4. Grounding connections that are part of a listed assembly as provided by the device manufacturer.

5. Coat all welded connections with zinc-enriched paint to prevent rusting.

6. Conductor bonding to the fence fabric shall be made using listed (UL 467 or equivalent) mechanical clamps.

7. Each bonding connection shall be liberally coated with a listed conductive antioxidant compound.

D. Bonding Methods Not Permitted

1. Connection devices or fittings that depend solely on solder shall not be used.

2. Standard pressure connectors having mechanical bonds (e.g. split-bolts and terminal bars with setscrew connections) shall not be used outdoors unless part of a listed assembly or otherwise permitted by this standard.

3. Mechanical connectors shall not be used below grade (e.g. split-bolts and terminal bars with setscrew connections).

3.4 FENCE AND GATE GROUNDING

A. All new site fencing permanently installed under this Contract, including gates, shall be effectively grounded to earth.

B. Fence Fabric:

1. The fence fabric near each grounded fence post shall also be bonded.

2. This bond may be made using the same grounding conductor used for the fence post, or by bonding directly to the fence post using compliant bonding methods.

3. The fence fabric bond shall be made in at least three equally spaced locations down the fence fabric.
C. Gate and Gate Posts:

1. Each gate post (on each side of the gate and locking posts for double gates) shall be bonded to the grounding rod using #2 AWG or coarser, bare, solid, tinned, copper conductors.

2. Gate framing shall be bonded to the gate supporting fence post grounding rod with #6 AWG or coarser, stranded, copper conductors. This jumper wire should be constructed with a highly flexible conductor.

3. Fence fabric for gates shall also be grounded/bonded to the grounding rod.

D. Deterrent Wiring:

1. If the site has non-electrified entry deterrent fence headers of barbed wire, razor wire, or other metallic wiring, the headers shall be bonded as follows:

   a. The deterrent wiring, near each corner fence post, shall be bonded to the nearest location of the ground ring using #2 AWG or coarser, bare, solid, tinned, copper conductor. This bond may be made using the same grounding conductor used for bonding the fence fabric.

   b. Each individual run of the deterrent wiring shall be bonded using a listed bimetallic transition connector.

   c. The grounding conductor shall be routed so as not come into incidental contact with the deterrent wiring, fence post, fence fabric or support apparatus for the wire.

   d. The grounding conductor shall follow the proper routing methods described in Section 33 79 83 - External Grounding Conductors.

END OF SECTION 33 79 13
PART 1: GENERAL

1.1 SUMMARY

A. This specification covers general requirements for external grounding and bonding conductor types, sizes and bonding methods for ancillary devices.

B. Grounding conductors are used to bond devices to a grounding electrode or grounding electrode system. These conductors may connect grounding electrodes together, form buried ground rings, and bond devices to the grounding electrode system.

1.3 REFERENCES

A. NFPA 70-2011: National Electrical Code
   1. Article 100 – Definitions
   2. Article 110.14 – Electrical Connections
   3. Article 200.6 – Means of Identifying Grounded Conductors
   4. Article 250.8 – Connections of Grounding and Bonding Equipment
   5. Article 250.12 – Clean Surfaces
   6. Article 250.62 – Grounding Electrode Conductor Material
   7. Article 250.64 (B) – Securing and Protection against Physical Damage
   8. Article 250.64 (C) – Continuous
   9. Article 250.64 (E) – Enclosures for Grounding Electrode Conductors

B. Underwriter Laboratories, Inc. (UL)
   1. UL 467 – Grounding and Bonding Equipment

PART 2: PRODUCTS

2.1 MATERIALS

A. External grounding conductors shall be made of tinned copper. The material selected shall be resistant to any corrosive condition existing at the installation location or shall be protected against corrosion.

   1. The same grounding conductor type shall be used throughout the installation.
2. To minimize galvanic corrosion between the structure being grounded and other parts of the grounding electrode system, untinned copper grounding conductors shall not be used.

3. Aluminum or copper-clad aluminum grounding conductors shall not be used.

B. Belowground or partially belowground, grounding conductors shall be #2 AWG or coarser, bare, solid, tinned, copper conductors.

1. For areas highly prone to lightning, and/or military installations, larger conductors, such as #1/0 AWG or coarser, bare, stranded, tinned, copper conductors should be considered.

C. Aboveground grounding conductors used for bonding individual metallic devices to the external grounding system shall be #6 AWG or coarser, tinned copper conductors.

D. Aboveground conductors used for bonding multiple metallic devices (when used as a ground bus conductor) shall be #2 AWG or coarser, tinned copper conductors.

E. Solid copper grounding straps may be used as long as the cross-sectional area equals or exceeds that of the specified grounding conductor.

PART 3: EXECUTION

3.1 GENERAL

A. Grounding conductors shall be installed in one continuous length without a splice or joint, unless spliced using listed (UL 467 or equivalent) irreversible, high-compression-type crimp connector or by exothermic welding connection.

B. Belowground grounding conductors shall be routed at the same depth as the grounding electrodes where practical (typically, 30 inches below grade level).

3.2 BENDING AND ROUTING GROUNDING CONDUCTORS

A. Grounding conductors shall be run in a direct manner with no sharp bends or narrow loops. Sharp bends and/or narrow loops increase the impedance and may produce flash points.

B. Grounding conductors shall be run as short, straight, and smoothly as possible, with the fewest possible number of bends and curves.

C. A minimum bending radius of 8 inches shall be maintained, applicable to grounding conductors of all sizes. A diagonal run is preferable to a bend even though it does not follow the contour or run parallel to the supporting structure.

D. All bends and curves shall be made toward the grounding location (grounding electrode, grounding electrode system or ground bus bar).
3.3 PROTECTING AND SECURING GROUNDING CONDUCTORS

A. Grounding conductors shall be protected where exposed to physical damage inside rigid polyvinyl chloride conduit (PVC).

B. Grounding conductors exposed to physical damage shall be protected for a minimum distance of six (6) feet above grade level.

C. Ferrous metallic conduits shall be avoided to provide grounding conductor protection. When ferrous metallic conduits are used to protect grounding conductors, each end of the conduit shall be bonded to the grounding conductor.

D. Grounding conductors or protective enclosures shall be securely fastened to the surface on which it is carried in increments not to exceed three (3) feet.

E. Grounding conductors shall be secured using appropriate hardware intended for the purpose. When metallic fasteners are used on bare grounding conductors, fasteners of the same material shall be used, or approved bonding techniques shall be observed for the connection of dissimilar metals.

F. Aboveground grounding conductors shall be securely fastened at intervals not exceeding three (3) feet where practical.

3.4 Reducing corrosion

A. Bare copper shall not come into incidental contact with galvanized steel.

B. Bare copper shall not come into incidental contact with aluminum.

C. Precipitation run-off from copper and copper alloys can attack galvanized parts therefore; bare copper conductors or copper bus bars shall not be installed above galvanized steel, such as a tower, and ice-bridges unless the steel is protected against the precipitation run-off.

D. Conductors of dissimilar metals shall not be intermixed in a terminal or splicing connector where physical contact occurs between dissimilar conductors (such as copper and galvanized steel, copper and aluminum, copper and copper-clad aluminum, or aluminum and copper-clad aluminum), unless the device is identified for the purpose and conditions of use.

END OF SECTION 33 79 83
PART 1: GENERAL

1.1 SUMMARY

A. This specification covers general requirements for grounding electrode types, sizes and bonding methods for electrical installations, and ancillary devices.

B. Grounding electrodes are the conducting elements used to connect electrical systems and/or equipment to the earth. The grounding electrodes are placed into the earth to maintain electrical equipment at the potential of the earth. Grounding electrodes may be ground rods, metal plates, concrete encased electrodes, ground rings, and electrolytic ground rods, the metal frame of a building or structure, and metal underground water pipes. (NFPA 70-2011, Article 250.52 – Grounding Electrodes)

1.2 REFERENCES

A. NFPA 70-2011: National Electrical Code
   1. Article 250.52 – Grounding Electrodes
   2. Article 250.53 – Grounding Electrode System Installation
   3. Article 250.104(B) – Other Metal Piping

B. Underwriter Laboratories, Inc. (UL)
   1. UL 467 – Grounding and Bonding Equipment

PART 2: PRODUCTS

2.1 GENERAL MATERIALS

A. Grounding electrodes shall be listed (UL 467 or equivalent).

B. Grounding electrodes shall be constructed of copper-clad steel, solid copper, hot-dipped galvanized steel, or stainless steel.
   1. Stainless steel ground electrodes shall be formed of an austenitic stainless steel of the 18 percent chromium, 8 percent nickel type.

C. Grounding electrodes shall be free of paint or other nonconductive coatings.

2.2 ELECTRODES PERMITTED FOR GROUNDING

A. Ground Rods and Pipe Electrodes:
   1. Ground Rods shall be listed (UL 467 or equivalent).
2. Ground Rods shall be constructed of copper-clad steel, solid copper, hot-dipped galvanized steel, or stainless steel
   a. Stainless steel ground rods shall be formed of an austenitic stainless steel of the 18 percent chromium, 8 percent nickel type.

3. Ground rods shall be free of paint or other nonconductive coatings.

4. Ground rods shall have a minimum length of eight (8) feet
   a. For areas highly prone to lightning, and/or military installations, longer rods, such as 10 feet, should be considered for the minimum length.

5. Ground rods shall have a minimum diameter of 0.625 inches, unless otherwise allowed by the listing of the ground rod and shall not be less than 0.5 inches.

2.3 NOT PERMITTED FOR USE AS GROUNDING ELECTRODES

A. The following systems and materials shall not be used as grounding electrodes:

1. Metal underground gas piping systems
   a. (NFPA 70-2011, Article 250.104(B) – Other Metal Piping) If installed in or attached to a building or structure, a metal gas piping system(s) that is likely to become energized shall be bonded to the electrical service equipment enclosure, the grounded conductor at the service, the grounding electrode conductor if of sufficient size, or to one or more grounding electrodes used.
   b. The bonding conductor or jumper shall be #6 AWG or coarser if routed above grade and #2 AWG or coarser if routed below grade or partially below grade.
   c. The points of attachment of the bonding jumper(s) shall be accessible.

2. Aluminum

PART 3: EXECUTION

3.1 GROUND ROD INSTALLATION

A. Where practical, ground rods shall be buried below permanent moisture level.

B. Where practical, ground rods shall penetrate below the frost line.

C. Ground rods longer than the minimum required 8-foot length may be required to maintain contact with permanently moist, unfrozen soil.

D. When not part of a ground ring system, the entire length of the ground rod shall be in contact with soil.

   1. Where practical, it is recommended to install the ground rods so the upper end of the rod is buried to a minimum depth of 24 inches below the surface of the earth.
E. Ground rods shall not be installed closer than six (6) feet from other ground rods and grounding electrodes.

F. Ground rods that cannot be driven straight down, due to contact with rock formations, may be driven at an oblique angle of no greater than 45 degrees from the vertical, or may be buried horizontally and perpendicular, in a trench at least 30 inches deep.

1. IMPORTANT: The top of a ground rod shall not be cut off if contact with rocks prevents driving of the rod. Alternate driving techniques shall be used in these cases.

2. Hammer drills or electric jackhammers may be used to drive in the ground rods. Do not deform the head of the ground rod.

3. If rock formations prevent ground rods from being driven to the specified depth, an alternate method of achieving an acceptable grounding electrode system shall be engineered and implemented.

G. When the grounding electrode system design requires deeper ground rods (in order to lower the grounding electrode system resistance, penetrate down to permanent moisture level, or to penetrate below the frost line) two or more ground rods may be joined together by use of a coupling (threaded, compression sleeve, or exothermic weld).

1. Threaded rods or compression sleeves shall be listed.

END OF SECTION 33 79 83.13