

AGREEMENT AND SPECIFICATIONS

ARROYO 1 DAM DETENTION IMPROVEMENTS

BID NUMBER SWCSP 64-23

VOLUME 1 OF 2

CONTRACT DOCUMENTS

JUNE, 2023



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06/28/23

**EL PASO WATER UTILITIES
PUBLIC SERVICE BOARD**

PSB BID NO. SWCSP 64-23

INFORMAL NOTICE

Sealed proposals for construction of Arroyo 1 Dam Detention Improvements will be received by the City of El Paso Water Utilities - Public Service Board at the Board's principal office located at 1154 Hawkins Boulevard or by mail to 1154 Hawkins Boulevard, El Paso, Texas, 79925 until Thursday, September 21, 2023, 1:30 p.m. local time. **After 1:30 p.m., bids will not be accepted.** Bid Opening will occur at 2:00 p.m. and bids will be publicly opened and read aloud via the "GoToMeeting" format noted in Section 00020.

The work under this contract shall be for furnishing all labor, materials, transportation, and services for the construction and installation of the following work:

Excavate/reshape Arroyo 1 channel over approximately 1700 linear feet, consisting of, but not limited to 30,100 CY. Install mortared rock rip-rap, gravel-filled soil stabilization system, articulated blocks, gabion mattress along the channel, and construct seven gabion basket weir drop structures. Construct a gravel-filled system maintenance access roadway for approximately 1900 linear feet.

Contract documents may be examined and obtained by accessing the following El Paso Water's website:
www.epwater.org/business_center/purchasing_overview/bids

If you have trouble accessing the Contract Documents, please contact the Purchasing Department of the El Paso Water Utilities, Public Service Board, at (915) 594-5628. Physical (hard) copies of the Contract Documents will **NO** longer be made available.

A pre-bid meeting will be held on Wednesday, September 6, 2023 at 10:00 a.m., local time (*see instructions at the end of Section 00020*).

Each Bid shall be submitted in accordance with the Instructions to Bidders and be accompanied by a Bid Security in the amount of five percent of the amount bid.

The Successful Bidder states he or she must furnish a 100 percent (100%) Performance Bond and a 100 percent (100%) Payment Bond, in accordance with the Instructions to Bidders and the General Conditions.

Bids shall be submitted at the time and place indicated in the Advertisement or Invitation to Bid and shall be enclosed in an opaque, sealed envelope marked with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), name and address of the Bidder and accompanied by the Bid security and other required documents. If the Bid is sent through the mail or other delivery system, the sealed envelope shall be enclosed in a separate envelope with the notation "BID ENCLOSED" on the face of it. The Bid proposal package shall include one original, three copies and an electronic version of the bid, containing a copy of the full bid package submitted, saved on a USB drive.

By submission of the bid, Bidder fully understands the requirements of the Contract Documents and agrees to comply with all requirements thereof.

Wages paid on this project shall be not less than the minimum prevailing wage rates listed in the Contract Documents, Section 00840, General Wage Requirements.

The El Paso Water Utilities (EPWater) adheres to the Cone of Silence policy which prohibits any communication regarding the bid between potential bidders (and subcontractors) and EPWater Board Members, Staff, and assigned Consulting Engineers. The provisions do not apply to oral communications with Purchasing Agent or Administrative Analyst, provided the communications is limited strictly to matters of process or procedure already contained in the solicitation document, oral communications at pre-bid conferences, or communications in writing (email preferred) submitted to the Administrative Analyst in response to inquiries regarding the bid. In addition to any other penalties provided by law, violation of the Cone of Silence by any bidder shall render that bidder's bid voidable. Any person having personal knowledge of a violation of these provisions shall report such violations to the EPWater General Counsel and/or the Purchasing Agent in writing.

**EL PASO WATER UTILITIES
PUBLIC SERVICE BOARD**

Arroyo 1 Dam Detention Improvements

Bid Number SWCSP 64-23

CITY OF EL PASO, TEXAS

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SECTION 00020
INVITATION TO BID

SECTION 00020

INVITATION TO BID

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The work under this contract shall be for furnishing all labor, materials, transportation, and services for the construction and installation of the following work:

Excavate/reshape Arroyo 1 channel over approximately 1700 linear feet, comprising a new cut/fill of 30,100 CY. Install mortared rock rip-rap, gravel-filled soil stabilization system, articulated blocks, gabion mattress along the channel, and construct seven gabion basket weir drop structures. Construct a gravel-filled system maintenance access roadway for approximately 1900 linear feet.

Contract documents may be examined and obtained by accessing the following El Paso Water's website:
www.epwater.org/business_center/purchasing_overview/bids

If you have trouble accessing the Contract Documents, please contact the Purchasing Department of the El Paso Water Utilities, Public Service Board, at (915) 594-5628. Physical (hard) copies of the Contract Documents will **NO** longer be made available.

A pre-bid meeting will be held on Tuesday, September 6, 2023 at 10:00 a.m., local time. *(see instructions at the end of this Section 00020).*

Each Bid shall be submitted in accordance with the Instructions to Bidders and be accompanied by a Bid Security in the amount of five percent of the amount bid.

The Successful Bidder must furnish a 100 percent (100%) Performance Bond and a 100 percent (100%) Payment Bond, in accordance with the Instructions to Bidders and the General Conditions.

Bids shall be submitted at the time and place indicated in the Advertisement or Invitation to Bid and shall be enclosed in an opaque sealed envelope, marked with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted) and name and address of the Bidder and accompanied by the Bid security and other required documents. If the Bid is sent through the mail or other delivery system, the sealed envelope shall be enclosed in a separate envelope with the notation "BID ENCLOSED" on the face of it. The Bid proposal package shall include one original, three copies and an electronic version of the bid, containing a copy of the full bid package submitted, saved on a USB drive.

By submission of the bid, Bidder states he or she fully understands the requirements of the Contract Documents and agrees to comply with all requirements thereof.

Wages paid on this project shall be not less than the minimum prevailing wage rates listed in the Contract Documents.

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with Purchasing Agent or Administrative Analyst, provided the communications is limited strictly to matters of process or procedure already contained in the solicitation document, oral communications at pre-bid conferences, or communications in writing (email preferred) submitted to the Administrative Analyst in response to inquiries regarding the bid. In addition to any other penalties provided by law, violation of the Cone of Silence by any bidder shall render that bidder's bid voidable. Any person having personal knowledge of a violation of these provisions shall report such violations to the EPWater General Counsel and/or the Purchasing Agent in writing.

PRE-BID MEETING INSTRUCTIONS

The Pre-Bid meeting will be held via Microsoft Teams meeting. Please join the meeting from your computer, tablet, or smartphone using the link below:

[Microsoft Teams Meeting](#)

Meeting ID: 239 848 619 912

Passcode: qvGUZD

Call in (audio only)

915-255-2297

Phone Conference ID: 538 465 241#

BID OPENING INSTRUCTIONS

Bid Openings are now to be broadcast through “GoToMeeting” format.

To View Bid Opening Click the Link Below:

**SWCSP 64-23 Arroyo 1 Dam Detention Improvements
Sep 21, 2023, 2:00 – 2:30 PM (America/Denver)**

Please join my meeting from your computer, tablet or smartphone.

<https://meet.goto.com/577378517>

You can also dial in using your phone.

Access Code: 577-378-517

United States (Toll Free): 1 866 899 4679

United States: +1 (571) 317-3116

Get the app now and be ready when your first meeting starts:

<https://meet.goto.com/install>

SECTION 00100
INSTRUCTION TO BIDDERS

SECTION 00100

INSTRUCTIONS TO BIDDERS

1. DEFINED TERMS *(Revised 3/18/96, 9/9/96, 4/21/97, 7/13, 10/16/20)*

Terms used in these Instructions to Bidders which are defined in the Standard General Conditions of the Construction Contract (EJCDC C-700, 2018 ed.) have the meanings assigned to them in the General Conditions. The term "Bidder" means the entity (such as a corporation, partnership, or sole proprietor) that submits a Bid directly to Owner, as distinct from a sub-bidder, who submits a Bid to a Bidder. The term "Successful Bidder" means the lowest, responsible, and responsive Bidder to whom Owner (on the basis of Owner's evaluation as hereinafter provided) makes an award. The term "Bidding Documents" includes the Advertisement or Invitation to Bid, Instructions to Bidders, the Bid Form, the Bid Bond or other Bid Security, and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids). Other terms are defined in this Section 00100.

Other terms used in the Bidding Documents and not defined elsewhere have the following meanings which are applicable to both the singular and plural thereof:

Texas Resident Bidder - A bidder whose principal place of business is in this state and includes a Contractor whose ultimate parent company or majority owner has its principal place of business in this state.

Nonresident Bidder - A bidder whose principal place of business is not in this state but excludes a Contractor whose ultimate parent company or majority owner has its principal place of business in this state.

EPCWID #1 - El Paso County Water Improvement District #1 which authorizes dewatering into its facilities under certain terms and conditions and with whom the Owner has negotiated specific basic fees and procedures.

NADB – North American Development Bank

2. COPIES OF BIDDING DOCUMENTS *(Revised 10/16/20)*

2.1 Complete sets of the Bidding Documents stated in the Advertisement or Invitation to Bid may be obtained by accessing the following El Paso Water Utilities – Public Service Board (EPWU-PSB) website:

https://www.epwater.org/business_center/purchasing_overview/bids/construction

If you have trouble accessing the Contract Documents, please contact the Purchasing Department of the EPWU-PSB at (915) 594-5628. Physical (hard) copies of the Contract Documents will no longer be made available.

2.2 Complete sets of Bidding Documents must be used in preparing Bids; neither the Owner nor the Engineer assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

2.3 Owner and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids on the Work and do not confer a license or grant for any other use.

3. REQUEST FOR COMPETITIVE SEALED PROPOSAL AND SELECTION OF BIDDER

This request for Competitive Sealed Proposal (CSP) is issued by El Paso Water (EPWater) for the Arroyo 1 Dam Detention Improvements Project. The purpose of this request is to select a respondent that has a proven record of successfully delivering projects involving excavation and reshaping of natural arroyos and installing mortared rock rip-rap, gravel-filled soil stabilization system, articulated blocks, gabion mattress, gabion basket weir drop structures, and continuous operation of stormwater systems to allow for safe passage of stormwater flows during construction. In order for Bidders to be considered and evaluated in the Competitive Sealed Proposal (CSP) for this project, they must meet all the requisites included in the MINIMUM GENERAL REQUIREMENTS – ALL CONSTRUCTION PROJECT and in the MINIMUM PROJECT SPECIFIC CRITERIA.

Evaluation Committee:

Gisela Dagnino, P.E. – Chief Operations Officer
Alberto Hernandez, P.E. – Engineering Division Manager
Enrique Ochoa, P.E. – Stormwater Operations Manager
Ivan Hernandez, P.E. – Utility Engineering Division Manager
Jorge Chavez, E.I.T. – Capital Improvements Project Manager
Alberto DeSantiago – Civil Engineering Associate
Jorge Lopez – Capital Improvements Project Manager

Alternate:

Elsa Ochoa, P.E. – Capital Improvements Project Manager
Salvador Solis – Capital Improvements Project Manager

The evaluation proposal will be based on four major categories as follows:

1. **Total Proposal Price. (30 Points Max)**
2. **Team’s experience with excavation and reshaping of natural arroyos, installing mortared rock rip-rap, gabion mattress, and gabion basket weir drop structures. (30 Points Max)**
3. **Team’s experience in installation of gravel-filled soil stabilization systems. (10 Points Max)**
4. **Experience in maintaining a critical stormwater facility operational during construction to allow for continuous operation in the event of a storm. (15 Points Max)**
5. **Project approach (15 Points Max)**

A description of the requirements and scoring instructions for each of the categories is presented below.

Award Recommendation for Competitive Sealed Proposal Criteria

1. Total Proposal Price. (30 Points Max)

EPWater is requesting pricing on the items identified in Section 00300 Bid Form. The lowest price will receive 30 points, and the rest of responsive bidders will receive a percentage of the 30 points relative to the lowest proposed cost.

Basis for evaluation:

- Bid Form (Section 00300)
- Offeror with lowest price receives **30** points
- Score for rest of offerors = **(Lowest Price/Offeror Price) X 30**

2. Team’s experience with excavation and reshaping of natural arroyos, installing mortared rock rip-rap, articulated blocks, gabion mattress, and gabion basket weir drop structures. (30 Points Max)

EPWater is interested in reviewing the bidder’s and subcontractors’ experience in projects dealing with excavation and reshaping of natural arroyos, installing mortared rock rip-rap, articulated blocks, gabion mattress, and gabion basket weir drop structures. This evaluation is based on the number of applicable projects completed by the bidder or subcontractor for each trade described above. The scoring is as follows:

Completed Projects dealing with the excavation and reshaping of natural arroyos, installing mortared rock rip-rap and articulated blocks

- 1 Qualifying Projects Completed: 5 points total
- 3 Qualifying Projects Completed: 10 points total
- 5 Qualifying Projects Completed: 15 points total

Completed Projects dealing with the installation of gabion mattress and gabion basket weir drop structures

- 1 Qualifying Projects Completed: 5 points total
- 3 Qualifying Projects Completed: 10 points total
- 5 Qualifying Projects Completed: 15 points total

Bidders must present the project experience for each trade described above in the format presented in the table below. The information for each project shall not exceed one page.

EPWATER – ARROYO 1 DAM DETENTION IMPROVEMENTS BIDDERS REPRESENTATIVE EXPERIENCE WITH EXCAVATION AND RESHAPING OF NATURAL ARROYOS AND INSTALLATION OF MORTARED ROCK RIP-RAP.

1. PROJECT NAME AND ADDRESS
Name:
Address (Physical Address or closest intersection):
2. NAME OF OWNER AND CONTACT INFORMATION
Owner Name:
Reference Name:
Contact Address:
Contact Telephone Number:
Contact Email Address:
3. EXCAVATION AND RESHAPING OF NATURAL ARROYOS AND INSTALLATION OF MORTARED ROCK RIP-RAP
Approximate length of channel excavated and reshaped:
Approximate depth of channel excavation:
Approximate cubic yardage of mortared rock rip-rap installed:
Project completion date:

EPWATER – ARROYO 1 DAM DETENTION IMPROVEMENTS BIDDERS REPRESENTATIVE EXPERIENCE WITH INSTALLATION OF GABION MATTRESS AND GABION BASKET WEIR DROP STRUCTURES.

1. PROJECT NAME AND ADDRESS
Name:
Address (Physical Address or closest intersection):
2. NAME OF OWNER AND CONTACT INFORMATION
Owner Name:
Reference Name:
Contact Address:
Contact Telephone Number:
Contact Email Address:
3. INSTALLATION OF GABION MATTRESS AND GABION BASKET WEIR DROP STRUCTURES
Approximate square yardage of gabion mattress installed:
Approximate cubic yardage of gabion basket weir drop structures installed:

Approximate depth of weir drop structures installed:
Project completion date:

3. Team’s experience in installation of gravel-filled soil stabilization systems. (10 Points Max)
 EPWater is interested in reviewing the bidder’s and subcontractors’ experience in projects dealing with the installation of gravel-filled soil stabilization systems. This evaluation is based on the number of applicable projects completed by the bidder or subcontractor for the trade described above. The scoring is as follows:

Completed Projects dealing with the installation of gravel-filled soil stabilization systems

- 1 Qualifying Projects Completed: 5 points total
- 3 Qualifying Projects Completed: 10 points total

EPWATER – ARROYO 1 DAM DETENTION IMPROVEMENTS BIDDERS REPRESENTATIVE EXPERIENCE WITH INSTALLATION OF GRAVEL-FILLED SOIL STABILIZATION SYSTEMS.

1. PROJECT NAME AND ADDRESS
Name:
Address (Physical Address or closest intersection):
2. NAME OF OWNER AND CONTACT INFORMATION
Owner Name:
Reference Name:
Contact Address:
Contact Telephone Number:
Contact Email Address:
3. INSTALLATION OF GRAVEL-FILLED SOIL STABILIZATION SYSTEMS
Approximate square yardage of gravel-filled soil stabilization installed:
Approximate depth of soil stabilized:
Project completion date:

- 4. Experience in maintaining a critical stormwater facility operational during construction to allow for continuous operation in the event of a storm. (15 Points Max)**
- 2 Qualifying Projects Completed: 10 points total
 - 3 Qualifying Projects Completed: 15 points total

Provide at least two projects demonstrating proper handling of stormwater flows during rain event during construction. The projects presented must have involved stormwater natural channels/arroyos.

1. PROJECT NAME AND ADDRESS
Name:
Address (Physical Address or closest intersection):
2. NAME OF OWNER AND CONTACT INFORMATION
Owner Name:
Reference Name:
Contact Address:
Contact Telephone Number:
Contact Email Address:
3. PROJECT INFORMATION
Storm event during construction? (Yes/No):
Project Description (Methods):

Channel/arroyo dimensions:
Pump Bypassing (Yes/No):
Project Duration:
Project completion date:
Total Cost of Project:

5. Project approach (15 Points Max)

EPWater is interested in the team’s approach for the successful completion of the construction of this project, on time, safely, and on budget. This shall include the team’s proposed construction sequence, methods proposed to complete the work, including safe operation of the existing stormwater system during storm events (including bypassing, and flow diversion), and their understanding of the project and current constraints.

In order for the bidder to receive the number of allocated points for this category, the following information is required to be submitted:

- a. Narrative with numbered steps describing the construction of each and all the project components listed in the Bid Tab of Section 00300. The narrative shall describe all relevant information on project major items and constraints such as slope stabilization during construction, plan for dam or diversion of low during project stages to maintain system operational in the event of storm events, and proposed installation of weir drop structures. In addition, include a narrative describing how the health and safety plan will be implemented. The overall narrative shall be at least on 8.5x11 page maximum with a 12pt font (1-10 points) **10 Points Maximum**
- b. Prepare and provide a tentative project construction schedule in the form of Gantt Chart following the proposed sequence described in the narrative above. Include all major milestones, sequences, etc. This shall be limited to (1) 11x17 page maximum. Pass (5 Points) / Fail (0 Points)

MINIMUM GENERAL REQUIREMENTS - ALL CONSTRUCTION PROJECTS

QUALIFYING PROJECTS

Bidders on Qualifying Projects must provide a Safety Record consisting of: (1) copies of the bidder’s OSHA Forms 300, 300A, and 301 for the last three calendar years (January – December); (2) the Establishment Search Results from the Occupational Safety and Health Administration’s website (<https://www.osha.gov/pls/imis/establishment.html>); and (3) a completed and signed Contractor Pre-Qualification Form (Section 00301). A Qualifying Project is a project with a value greater than \$100,000 or one that the Chief Technical Officer and Vice President of Operations and Technical Services determine poses a significant hazard.

EPWU will deem a bidder not responsible if the bidder (1) fails to provide a complete Safety Record; (2) received within the last three calendar years (January – December) six or more serious violations, one or more willful violations, or a single repeat of a serious violation; or (3) has experienced a workplace

fatality in the last three calendar years (January – December), unless the bidder can demonstrate that the factors that caused the fatality were outside the bidder’s control. A bidder, however, may fail the above criteria but still be deemed responsible if (1) no other appropriate bidder can be found; (2) the bidder is approved by the Chief Technical Officer and the Vice President of Operations and Technical Services; and (3) the bidder agrees to implement the special safety procedures (which might include a requirement to work only with trained EPWU personnel present) that the Vice President of Operations and Technical Services establishes for the project.

PROJECTS WITH VALUE LESS THAN \$1,000,000:

The Bidder, or at least two *Key Personnel employed by the Bidder, must demonstrate **Successful Completion of a project similar in nature and scope to this project within the past five years and a similar project with a value of at least one-third the value bid for this project.

PROJECTS WITH VALUE BETWEEN \$1,000,000 AND \$3,000,000:

The Bidder, or at least three *Key Personnel employed by the Bidder, must demonstrate **Successful Completion of one project similar in nature and scope to this project within the past five years and one similar project with a value of at least 50% of the value bid for this project.

PROJECTS WITH VALUE BETWEEN \$3,000,000 AND \$6,000,000:

The Bidder must demonstrate a minimum of four years of experience in projects similar in nature and scope to this project. At least four *Key Personnel employed by the Bidder must have a minimum of five years of experience in similar construction projects. The Bidder must demonstrate **Successful Completion during the last five years of at least one project comparable in nature and scope to this project and one similar project with a dollar value of at least 60% of the value bid for this project. The Bidder must have an employee, to be dedicated to this project, who is experienced in scheduling, with demonstrated ability in employing scheduling techniques similar to those to be used for this project.

PROJECTS WITH VALUE BETWEEN \$6,000,000 AND \$15,000,000:

The Bidder must have a minimum of five years of experience in projects similar in nature and scope to this project. At least four of the Bidder’s *Key Personnel must have a minimum of five years of experience in similar construction projects. The Bidder must demonstrate **Successful Completion of at least two projects similar in nature and scope to this project and one similar project with a dollar value of at least 75% of the value bid for this project, both within the past five years. The Bidder must demonstrate that it has an experienced employee who will serve as the scheduler; who is dedicated to this project; who has successfully employed scheduling techniques appropriate for this project. At least two *Key Personnel for this project must have completed at least two projects, similar in scope and nature to the project being bid, as an employee of the Company bidding this project.

* KEY PERSONNEL: Defined as individuals who will be directly assigned to this project which includes, but is not limited to, the Bidder’s Project Manager, the Project Superintendent, the Scheduler, the Bidder’s Construction Engineer, and Supervisory personnel such as the Foremen who will be directly assigned to this project as well as similar Subcontractor Key Persons. Resumes of Key Personnel must be submitted and accepted by the Owner in order for Bidder to receive the Award.

** SUCCESSFUL COMPLETION: Defined as completion of a project on time, which generally means no more than thirty days later than the original contract time allocated. It also means within budget, which generally means within 5% of the original contract price. If there is any project submitted by the Bidder as qualifying, but which does not meet these requirements, in order to be fully responsive, the Bidder is required to submit detailed information on that project demonstrating what caused the increases to cost or time. The name and telephone numbers of the Design Engineer and the Client are to be provided for evaluation as to whether the project may be considered “successful”. For any project where liquidated

damages were assessed, the Bidder will not be considered to have been on time.

BIDDER MUST MEET THE FOLLOWING MINIMUM PROJECT SPECIFIC CRITERIA IN ORDER TO QUALIFY FOR AWARD OF THE BID:

1. Project requires prior experience in extensive earthwork in a flood-prone natural arroyo. Bidder or approved subcontractor must demonstrate successful completion of at least two (2) projects within the last ten (10) years that included excavation of 20,000 CY and installation of 5,000 CY of select fill of embankment for channel in a flood-prone area. Separate projects may be used to fulfill these requirements.
2. Project requires prior experience in the installation of mortared rock rip-rap and articulated blocks. Bidder or approved subcontractor must demonstrate successful completion of at least two (2) projects within the last ten (10) years that included installation of 10,000 SY of mortared rock rip-rap. Separate projects may be used to fulfill these requirements.
3. Project requires prior experience in the installation of gabion mattress and gabion basket structures. Bidder or approved subcontractor must demonstrate successful completion of at least two (2) projects within the last ten (10) years that include installation of 3,000 SY of gabion mattress and 500 CY of gabion basket structures. Separate projects may be used to fulfill these requirements.
4. Project requires prior experience in the installation of gravel-filled soil stabilization system. Bidder or approved subcontractor must demonstrate successful completion of at least one (1) project within the last ten (10) years that include installation of gravel-filled soil stabilization system.
5. Bidder or approved subcontractor must provide at least two (2) projects within the last ten (10) years where the following conditions are satisfied: 1) haul routes implemented through residential areas, high impact areas and school zones and 2) maintained safe traffic control plan for residents and haul transport vehicles around the project area at all times.
6. Bidder or approved subcontractor must provide at least two (2) projects within the last ten (10) years demonstrating proper handling of stormwater flows during rain event during construction. The projects presented must have involved stormwater natural channels, arroyos, dams or ponds.

**EPWU CIP FUNDED PROJECTS
GOOD FAITH EFFORTS
TO OBTAIN MINORITY PARTICIPATION IN THIS PROJECT**

The Utility's policy for its projects is to encourage the participation of Small Locally-Owned Businesses (SLBE), Minority Business Enterprises (MBE), and Women-Owned Business Enterprises (WBE). The utility's minimum goals for this project are:

25% FOR SMALL LOCALLY-OWNED BUSINESSES
10% FOR MINORITY-OWNED BUSINESSES
7% FOR WOMEN-OWNED BUSINESSES

The bidder must meet each of these three goals or demonstrate at the time of making the bid that he or she has made a good faith effort to meet each of the three goals in order to qualify for award of this project. The definition of a "Good Faith Effort" is described below. If the bidder fails to meet the goals, *and also*

fails to provide evidence that a good faith effort has been made to meet each goal, the Owner reserves the right to request additional information from the bidder as support to Good Faith Effort documentation. The bidder may meet the requirement in one of three ways:

1. If goals in each category are fully achieved, bidder to provide all details of the actual participation in the Bid Proposal Form, Section 00300, where space has been provided for bidder's use.
2. If goals are partially achieved in each of the categories, bidder to provide the details of the actual participation in the Bid Proposal Form, and to provide evidence of the Good Faith Effort to meet each goal, as part of the bid proposal, at the time the bid is submitted.
3. If goals are not achieved, bidder to provide evidence of a demonstrated Good Faith Effort, as defined below, as part of the bid proposal, at the time the bid is submitted.

Although a single prime contractor, a subcontractor, or a supplier may be a Small Locally-Owned Business and also a Minority Business or a Woman-Owned Business, each firm will be counted in only one category (SLBE, MBE, or WBE) for purposes of meeting these goals.

DEFINITIONS (Revised 7/28/14, 10/16/20, 3/4/22)

GOOD FAITH EFFORT: Documentation that minority firms were given a genuine opportunity to participate. Evidence of a Good Faith Effort must include copies of a reasonable number of letters sent to bona fide firms in each of the categories described showing the full details of the work solicited to be performed by the minority firm; copies of certified mail/return receipts, facsimile or e-mail confirmations of receipt, copies of responses to the letters, and copies of correspondence with the Chamber of Commerce, Small Business Administration, Minority Business Development Agency, MBE and WBE associations, and/or newspaper or trade magazine notices. Facsimile and e-mail confirmations of receipt must show sufficient information to identify the company name to which the solicitation was sent. Sample solicitation letters are included in Section 00310. The Owner's Purchasing Department has a listing of qualified firms in each of these categories, which are available on the Owner's website, https://www.epwater.org/business_center/purchasing_overview/become_a_hub_vendor. Additional sources for locating Small Locally-Owned Business Enterprises, Minority-Owned Business Enterprises, and Women-Owned Business Enterprises: Texas Comptroller of Public Accounts <http://www.window.state.tx.us/procurement/prog/hub/hub-reporting/>, El Paso Hispanic Chamber of Commerce Minority Business Enterprise Center, <https://ephcc.org/blog/other-resources/procurement-opportunities/>.

SMALL LOCALLY-OWNED BUSINESS ENTERPRISE (SLBE): A business corporation, partnership, joint venture, sole proprietorship, or other legal entity formed for the purpose of making a profit, has been located within the County of El Paso for at least twelve months and is 51% or more owned by residents of El Paso County; furthermore, that business must employ fewer than 100 employees or have annual gross sales of less than \$7,000,000 and is not a subsidiary of a business which would not meet these guidelines.

MINORITY-OWNED BUSINESS ENTERPRISE (MBE): A business that is at least 51% owned and controlled by one or more citizens or lawful permanent residents of the United States who are either African American, Hispanic American, Asian American, Native American, or Service Disabled Veteran.

WOMEN-OWNED BUSINESS ENTERPRISE (WBE): A business that is at least 51% owned and controlled by one or more citizens or lawful permanent resident of the United States who are non-minority females.

The form entitled "Minority Certification and Participation Summary", which is located at the end of Section 00300, Bid Form, should be completed and submitted by the Successful Bidder within ten days of Notice of Award.

It is mandatory that bidder submit with his or her bid a fully executed bid proposal (including the tabulation of proposed subcontractors and suppliers), an original bid bond, the certificate of insurance availability, and minority participation categories reflecting bidder has met minority participation goals OR evidence of bidder's good faith effort to do so. Failure to submit these items with the bid will result in a finding that the bid is non-responsive and the bid will be disqualified.

Evidence of bidder's good faith effort *or* evidence of *full* participation in each category is also required at the time of bid. Owner reserves the right to request additional information from the bidder as support to good faith effort documentation.

Bidders shall furnish a financial statement or other evidence of the Bidder's financial sufficiency to perform the contract, a sworn statement of his or her experience record, and a listing of the equipment available to him or any other statement or documentation required by the Owner or Owner's consultant as to his or her capability to complete the Work. The Post-Bid/Pre-Award Checklist and the Qualifications Statement may require submittal of additional documentation. PLEASE REVIEW THE CHECKLISTS PROVIDED AT THE END OF THIS SECTION 00100.

To assist the Owner in evaluating the Bidder's responsibility, the lowest responsive Bidder is required to complete and submit the "Qualification and Financial Disclosure Statement" found at the end of Section 00100 within five calendar days of the consulting Engineer's request. The Engineer will submit this document and any additional information received as requested by the consulting Engineer, to the Owner as an attachment to his or her Recommendation of Award.

The Checklists found at the back of this Section are provided to assist the Bidder in fulfilling these requirements.

The Purchasing Department will evaluate the responsiveness of the Bidder's submittal. Purchasing Agent will forward the bids and results of the Purchasing Department's evaluation to the consulting Engineer for further evaluation of responsiveness, qualifications of the Bidder and other related conditions of this Bid. Engineer will forward the results of the evaluation to the Owner in writing. Owner will review Engineer's evaluation and present its recommendation to the Public Service Board for award.

Bidder is required to submit information regarding his or her status as a "RESIDENT" or "NONRESIDENT" as shown on the spaces provided in the proposal form.

A "Nonresident Bidder" will not be awarded the Contract if the state of his or her principal place of business assesses a penalty against out-of-state bidders unless his or her bid is lower than the lowest bid submitted by a responsible Texas resident bidder by the same amount that a Texas resident bidder would be required to underbid the nonresident bidder to obtain a comparable contract in the state in which the nonresident's principal place of business is located.

The terms "Texas Resident Bidder" and "Nonresident Bidder" shall the meanings set forth for those terms in Chapter 2252 of the Texas Government Code.

4. EXAMINATION OF CONTRACT DOCUMENTS AND SITE (Revised 3/18/96, 4/21/97, 1/18/10, 1/12/11, 4/13, 10/16/20)

- 4.1 It is the responsibility of each Bidder, before submitting a Bid, to (a) examine the Contract Documents thoroughly, (b) visit the site to become familiar with local conditions that may affect cost, progress, performance or furnishing of the Work, and to determine the character of equipment and facilities needed preliminary to and during the prosecution of the Work, (c) consider federal, state and local laws and regulations that may affect cost progress, performance or furnishing of the Work, (d) study and carefully correlate Bidder's observations with the Contract Documents, and (e) notify Engineer of all conflicts, errors, or discrepancies in the Contract Documents.

When information as to soil conditions, test borings, and existing underground and overhead utility locations is shown on the Plans, Specifications, Drawings, or in preliminary reports prepared by

the Engineer or under the Engineer's direction, such information was obtained for the Owner. The correctness of such information is not guaranteed by the Owner or by the Engineer and in no event shall be considered as a part of the contract, an inducement to bidding, or a factor for computation of bids. If such information is used by the Bidder in preparing a proposal, the Bidder must assume all risks that conditions encountered in performing the Work may be different from the approximation shown. Owner hereby grants reasonable access to Bidder and/or his employees or contractors to examine the work site over which Owner has ownership or control.

4.2 Reference is made to the Supplementary General Conditions for identification of:

4.2.1 Those reports of explorations and tests of subsurface conditions at the site which have been utilized by Engineer in preparation of the Contract Documents.

4.2.2 Those drawings of physical conditions in or relating to existing surface and subsurface conditions (except Underground Facilities) which are at or contiguous to the site which have been utilized by Engineer in preparation of the Contract Documents.

Copies of such reports and drawings will be made available by Owner to any Bidder on request. Those reports and drawings are not part of the Contract Documents. Technical data has been identified and established in the Supplementary General Conditions.

4.2.3 See SC 18.13. Those certain dewatering issues, procedures, payment terms, submittal requirements, and close out terms which are the responsibility of the Bidder and which may impact Bidder's pricing of this Bid.

4.3 Information and data reflected in the Contract Documents with respect to Underground Facilities at or contiguous to the site is based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities or others, and Owner does not assume responsibility for the accuracy or completeness thereof.

4.4 Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders on subsurface conditions, Underground Facilities and other physical conditions, and possible changes in the Contract Documents due to differing conditions appear in Paragraphs 5.03 and 5.04 of the General Conditions, and as may be amended in the Supplementary General Conditions.

4.5 Before submitting a Bid, each Bidder will, at Bidder's own expense, make or obtain any additional examinations, investigations, explorations, tests and studies and obtain any additional information and data which pertain to the physical conditions (surface, subsurface and Underground Facilities) at or contiguous to the site or otherwise which may affect cost, progress, performance or furnishing of the Work and which Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price and other terms and conditions of the Contract Documents.

4.6 Each Bidder will be required to get permission from property owners to obtain access to the site to conduct such explorations and tests as each Bidder deems necessary for submission of a Bid. Bidder shall fill all holes, clean up and restore the site to its former condition and to the satisfaction of the Engineer, upon completion of such explorations. Owner hereby grants reasonable access to Bidder and/or his employees or contractors to examine the work site over which Owner has ownership or control.

4.7 The lands upon which the Work is to be performed, rights-of-way and easements for access thereto and other lands designated for use by Contractor in performing the Work are identified in the Contract Documents. All additional lands and access thereto required for temporary construction facilities or storage of materials and equipment are to be provided by Contractor. Easements for permanent structures or permanent changes in existing structures are to be obtained and paid for by

Owner unless otherwise provided in the Contract Documents.

- 4.8 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception the Bid is premised upon performing and furnishing the work required by the Contract Documents and such means, methods, techniques, sequences or procedures of construction as may be indicated in or required by the Contract Documents, and that the Contract Documents are sufficient in scope and detail to indicate and convey to Bidder the understanding of all terms and conditions for performance and furnishing of the Work.

5. INTERPRETATIONS AND ADDENDA (Revised 10/16/20, 3/4/22)

- 5.1 Pursuant to the Cone of Silence policy, all questions about the meaning or intent of the Contract Documents are to be directed to the Purchasing/Contracts Department (see *Purchasing Contacts on EPWU website: https://www.epwater.org/business_center/purchasing_overview/bids/construction*). Interpretations or clarifications considered necessary by EPWU staff, Engineer, or Consultant in response to such questions will be issued by Addenda and will be posted on the EPWU website. Bidder will be responsible to check the website regularly for any addenda or additional information for the project. Questions received less than ten (10) days prior to the date for opening of Bids will not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications, either by EPWU staff, Engineer, or Consultant will be without legal effect.
- 5.2 Addenda may also be issued to modify the Bidding Documents as deemed advisable by Owner or Engineer, with Owner's approval.

6. BID SECURITY (Revised 10/12/92, 2/25/93, 1/10/95, 5/22/95, 1/18/10, 7/13, 1/17/19, 10/16/20, 3/4/22)

- 6.1 Each Bid must be accompanied by an original and notarized Bid security made payable to Owner in an amount of five percent of the Bidder's maximum Bid price and in the form of a certified or cashier's check or a Bid Bond issued by a surety meeting the requirements of Paragraph 6.01 of the General Conditions and Paragraph 6.01 of the Supplementary General Conditions.
- 6.2 The Bid security of the Successful Bidder will be retained until such Bidder has executed the Agreement and furnished the required contract security and insurance, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Agreement and furnish the required contract security, insurance, and other required contract documents within ten days after the Notice of Award, Owner may annul the Notice of Award and the Bid security of that Bidder will be forfeited. The Bid security of other Bidders whom Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of the seventh day after the Effective Date of the Agreement or the ninety-first day after the Bid opening, whereupon Bid security furnished by such Bidders will be returned. Bid security with Bids which are not competitive will be returned within seven days after the Bid opening.

The Bidder agrees by signing this Bid that he fully understands the requirements of the bid documents.

An incentive payment is available in the amount of \$100 per day, up to a maximum of \$300, for the Bidder's successful efforts in expediting delivery of fully compliant documents in a time period shorter than the 10-day maximum called out in the Notice of Award.

Should the Bidder fail to return the Agreements, acceptable Bonds, Insurance Certificates and insurance policies within ten days of receipt of the documents, the Utility may charge excess costs generated by such delay at the rate of \$100 for each day of delay. In the event more than two reviews of insurance submittals are required by the Utility's Risk Manager, the Successful Bidder

will additionally reimburse the Utility for those costs at the rate of \$150 per hour which will apply to each fifteen-minute fraction thereof charged by the Risk Manager. These reimbursed costs will be deducted from the Bidders first Application for Payment or, in the event a Bid Bond is forfeited, such expenses may be reimbursed from the proceeds of the Bid Bond as part of the excess costs or re-procurement.

7. CONTRACT TIME

The number of Calendar Days within which, or the dates by which, the Work is to be substantially completed and also completed and ready for final payment (the Contract Time) are set forth in the Agreement. Completion within this time is of the essence in the performance of this contract.

8. LIQUIDATED DAMAGES *(Revised 3/18/96, 10/16/20)*

Provisions for liquidated damages, if any, are set forth in the Agreement and in the Supplementary General Conditions SC-11.11.

9. SUBSTITUTE OR "OR EQUAL" ITEMS

The Contract, if awarded, will be on the basis of materials and equipment described in the Drawings or specified in the Specifications without consideration of possible substitute or "or equal" items. Whenever it is indicated in the Drawings or specified in the Specifications that a substitute or "or equal" item of material or equipment may be furnished or used by Contractor is acceptable to Engineer, application for such acceptance will not be considered by Engineer until after the date of the Notice to Proceed. The procedure for submission of any such application by Contractor and consideration by Engineer is set forth in Paragraphs 7.05 and 7.06 of the General Conditions and may be supplemented in the General Requirements.

10. SUBCONTRACTORS, SUPPLIERS AND OTHERS *(Revised 10/12/92, 9/9/96, 12/10/97, 12/17/99, 7/13, 10/16/20)*

10.1 The Bidder is required to identify all Subcontractors and Suppliers; to provide the value of each proposed subcontract or purchase order; and to report their own and their subcontractor's business classification (Small Locally-Owned Business Enterprise, Minority Business Enterprise, Woman-Owned Business Enterprise, or Other). The Bidder shall submit with his or her Bid a list of all proposed Subcontractors and Suppliers. Space for this submittal is provided within the Bid Proposal, Section 00300. Use additional sheets as necessary. The Bidder is required to submit the MWBE Certification and Participation Summary Form with his or her Bid. If requested by Engineer or by Owner, Bidder shall provide an experience statement with pertinent information regarding similar projects and other evidence of qualifications for each such Subcontractor, Supplier, person, or organization. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, other person or organization, either Owner or Engineer may, before the Notice of Award is given, request the apparent Successful Bidder to submit an acceptable substitute, in which case the apparent Successful Bidder shall submit an acceptable substitute, that Bidder's Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution and Owner may consider such price adjustment in evaluating Bids and making the Contract Award.

10.2 No Contractor shall be required to employ any Subcontractor, Supplier, other person or organization against whom Contractor has reasonable objection.

10.3 The Bidder shall submit a Final Report of total payments made to each subcontractor and supplier, as part of the required close out documents.

This submittal shall be made as a condition precedent to Final Payment.

11. BID FORM *(Revised 10/16/20)*

- 11.1 The Bid Form is included with the Bidding Documents.
- 11.2 All blanks on the Bid Form must be completed in ink. Bids which do not have all blanks filled in or completed may be rejected at the Owner's option by Owner or Purchasing Agent.
- 11.3 Bids by corporations must be executed in the corporate name by the president or a vice president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal if any must be affixed and officer's signature must be attested by the secretary or an assistant secretary. The corporate address, state of incorporation, and state of principal place of business must be shown below the signature.
- 11.4 Bids by partnerships must be executed in the partnership name and signed by a partner, whose title and authority to sign must appear under the signature and the official address of the partnership must be shown below the signature.
- 11.5 All names must be printed below the signature.
- 11.6 The Bid shall contain an acknowledgment of receipt of all Addenda (the numbers of which must be filled in on the Bid Form).
- 11.7 The address and telephone number for communications with Bidder regarding the Bid must be shown.

12. SUBMISSION OF BIDS *(Revised 10/16/20, 3/4/22)*

Bids shall be submitted at the time and place indicated in the Advertisement or Invitation to Bid and shall be enclosed in an opaque, sealed envelope, marked with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), name and address of the Bidder and accompanied by the Bid security and other required documents. If the Bid is sent through the mail or other delivery system, the sealed envelope shall be enclosed in a separate envelope with the notation "BID ENCLOSED" on the face of it. The Bid proposal packet shall include one original, three copies and an electronic version of the bid, containing a full copy of the full bid package submitted, saved on a USB drive.

Any questions or clarifications pertaining to the bid documents, requirements, specifications, or terms and conditions of the bid or contract documents should be addressed via the Addendum process described above in Section 5. Any extraneous documentation, letters, explanations, limitations, commentary, conditions, or the like submitted with a Bid will ***NOT*** be considered or incorporated as the basis of any award. Bidder agrees to be held solely to the terms and conditions of these Bid documents; General and Supplementary Conditions (as may be amended from time to time); and any other documents identified by EPWU.

13. MODIFICATION AND WITHDRAWAL OF BIDS

- 13.1 Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a Bid must be executed) and delivered to the place where Bids are to be submitted at any time prior to the opening of Bids.
- 13.2 If, within twenty-four hours after Bids are opened, any Bidder files a duly signed, written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid; that the mistake is clerical; that the mistake is so serious that enforcement of the Bid would be unconscionable; and that the mistake has occurred despite the exercise of ordinary care; that Bidder may withdraw its Bid and the Bid security will be returned. Thereafter, that Bidder will be disqualified from further bidding on the Work to be provided under the Contract Documents.

14. OPENING OF BIDS

Bids will be opened and (unless obviously nonresponsive) read aloud publicly. An abstract of the amounts of the base Bids and major alternates (if any) will be made available to Bidders after the opening of Bids.

15. BIDS TO REMAIN SUBJECT TO ACCEPTANCE *(Revised 12/10/97, 1/18/10, 7/13, 10/16/20)*

All Bids will remain subject to acceptance for a minimum of 90 days after the day of the Bid opening, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to that date. In the case of State, Federal, or NADBank-funded projects, all Bids will remain subject to acceptance for 90 days or such reasonable time as the funding agency may require.

16. AWARD OF CONTRACT *(Revised 3/18/96, 12/10/97, 10/9/98, 1/18/10, 10/16/20)*

16.1 Owner reserves the right to reject any and all Bids, to waive any and all informalities not involving price, time or changes in the Work and the right to disregard all immaterial, nonconforming, nonresponsive, unbalanced, or conditional Bids. Also, Owner reserves the right to reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to the Bidder, whether because the Bid is not responsive, or the Bidder is not responsible because the Bidder is deemed to be unqualified or of doubtful financial ability or fails to meet any other pertinent criteria established by Owner under Paragraph 3 hereof. Discrepancies in the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Any bids submitted in which there is a material failure to comply with the Bid requirements or specifications will be rejected and the contract will be awarded to the lowest responsible Bidder conforming to the specifications unless the Owner decides to reject all Bids.

16.2 In evaluating Bids, Owner will consider the responsiveness of the Bid, responsibility of the Bidders, whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.

16.3 Owner may consider the qualifications and experience of Subcontractors, Suppliers, and other persons and organizations proposed for those portions of the Work as to which the identity of Subcontractors, Suppliers, and other persons and organizations must be submitted as provided in the Supplementary General Conditions or other sections of this bid document. Owner also may consider the operating costs, maintenance requirements, performance data and guarantees of major items of materials and equipment proposed for incorporation in the Work when such data is required to be submitted prior to the Notice of Award or as a substitute.

16.4 Owner may conduct such investigations as Owner deems necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications and financial ability of Bidders, proposed Subcontractors, Suppliers and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents to Owner's satisfaction within the prescribed time.

16.5 If the contract is to be awarded, it will be awarded to the lowest Bidder whose responsibility has been evaluated in accordance with these Instructions to Bidders.

16.6 If the contract is to be awarded, Owner will give the Successful Bidder a Notice of Award within 90 days after the day of the Bid opening. In the case of State or Federally-funded projects, Owner will give the Successful Bidder a Notice of Award within 90 days after the day of the Bid opening, or such reasonable time as the funding agency may require.

17. CONTRACT SECURITY *(Revised 9/17/93; 3/18/96, 7/13, 10/16/20, 3/4/22)*

Paragraph 6.01 of the General Conditions and the Supplementary General Conditions set forth Owner's requirements as to performance and payment Bonds. When the Successful Bidder delivers the executed Agreement to Owner, it must be accompanied by the required Performance and Payment Bonds and the Certificate of Insurance and insurance policies. A Payment Bond must be provided for contracts more than \$50,000 in value. If the contract requires an expenditure of less than \$100,000, the Owner reserves the right to waive the requirement for a Performance Bond, provided that payment is not due to the Contractor until the Work is completed and accepted by the Owner. Any provision in any bond furnished in attempted compliance with House Bill No. 31 that expands or restricts the rights or liabilities provided under this Act shall be disregarded and the provisions of this Act shall be read into that Bond.

18. SIGNING OF AGREEMENT

When Owner gives a Notice of Award to the Successful Bidder, it will be accompanied by the required number of unsigned counterparts of the Agreement with all other written Contract Documents attached. Within ten days after, Contractor shall sign and deliver the required number of counterparts of the Agreement and attached documents to Owner with the required Bonds and a copy of the Certificate of Insurance along with a copy or copies of the actual Insurance policy or policies. Owner shall deliver fully signed final contract to Contractor when all pre-construction contract requirements have been met.

19. PRE-BID CONFERENCE *(Revised 10/16/20)*

A pre-bid conference will be held at 10:00 a.m., local time, on the 6th day of September, 2023 virtually using Microsoft Teams software. The link for the meeting will be posted on the EPWater website. Representatives of Owner and Engineer will be present to discuss the Project. Bidders are encouraged to attend and participate in the conference. Owner will publish on the EPWater website such Addenda as Engineer considers necessary in response to questions arising at the conference.

20. SALES AND USE TAXES *(Revised 3/18/96, 4/13)*

Owner is exempt from Municipal and State Sales and Use Taxes on materials and equipment to be incorporated in the Work. Said taxes shall not be included in the Contract Price. Refer to Supplementary General Conditions SC-7.10.B for additional information.

QUALIFICATION AND FINANCIAL DISCLOSURE STATEMENT

BIDDER:

PROJECT NAME:

Arroyo 1 Dam Detention Improvements

1. ORGANIZATION

- 1.1 How many years has your organization been in business as a Contractor?

- 1.2 How many years has your organization been in business under its present business name?
 - 1.2.1 Under what other or former names has your organization operated?

- 1.3 If your organization is a corporation, answer the following:
 - 1.3.1 Date of incorporation: _____
 - 1.3.2 State of incorporation: _____
 - 1.3.3 President's name: _____
 - 1.3.4 Vice-president's name(s): _____

 - 1.3.5 Secretary's name: _____
 - 1.3.6 Treasurer's name: _____

- 1.4 If your organization is a partnership, answer the following:
 - 1.4.1 Date of organization: _____
 - 1.4.2 Type of partnership (if applicable): _____
 - 1.4.3 Name(s) of general partner(s): _____

- 1.5 If your organization is an individually owned sole proprietorship, answer the following:
 - 1.5.1 Date of organization: _____
 - 1.5.2 Name of owner: _____

- 1.6 If the form of your organization is other than those listed above, describe it and name the principals:

2. LICENSING

- 2.1 List jurisdictions and trade categories in which your organization is legally qualified to do business, and indicate registration or license numbers, if applicable. Indicate name, license number and expiration date for Master Electrician or other trade required under the Instructions to Bidders section of this Bid.
- 2.2 List jurisdictions in which your organization's partnership or trade name is filed.

3. EXPERIENCE (Revised 3/18/96, 9/9/96, 12/10/97, 10/9/98, 7/13)

- 3.1 List the categories of work that your organization normally performs with its own forces.
- 3.2 Claims and Suits. (If the answer to any of the questions below is yes, please attach details.)
 - 3.2.1 Has your organization ever failed to complete any work awarded to it?
 - 3.2.2 Are there any judgments, claims, arbitration proceedings, or suits pending or outstanding against your organization or its officers?
 - 3.2.3 Has your organization filed any lawsuits or requested arbitration with regard to construction contracts within the last five years?
- 3.3 Within the last five years, has any officer or principal of your organization been an officer or principal of another organization when it failed to complete a construction contract? (If the answer is yes, please attach details.)
- 3.4 On a separate sheet, list major construction projects your organization has in progress, giving the name of project, owner, architect, contract amount, percent complete and scheduled completion date.
 - 3.4.1 State total worth of work in progress and under contract:
- 3.5 On a separate sheet, list the major projects your organization has completed in the past five years, giving the name of project, owner, architect, contract amount, date of completion and percentage of the cost of the work performed with your own forces.
 - 3.5.1 State annual amount of construction work performed each year during the past five years:
- 3.6 On a separate sheet, list the construction experience and present commitments of the key individuals of your organization. Submit resumes of Key Personnel (as defined in Section 00100, Instructions to Bidders). By execution of this bid, the Bidder certifies that its Resident Superintendent has the authority to act on behalf of the Contractor at all times. No substitution shall be made without the written approval of the Owner and the Engineer based upon acceptance of the qualifications of the proposed substitute.
- 3.7 On a separate sheet, provide evidence that the Bidder meets the minimum criteria called out in Section 00100, Instructions to Bidders. Provide similar evidence for Subcontractors, if required by Bid or by Engineer.

3.8 Provide the MWBE CERTIFICATION SUMMARY FORM found at the end of Section 00300.

4. REFERENCES

4.1 Trade References:

4.2 Bank References:

4.3 Surety:

Name and telephone number of Bonding Company: _____

Name, telephone, and address of Agent: _____

5. FINANCING

5.1 Financial Statement

5.1.1 Attach a financial statement, preferably audited, including your organization's latest balance sheet and income statement showing the following items:

- a. Cash Flow Statement
- b. Notes to Financial Statement
- c. Auditor Statement
- d. Comparison Statements, if available

5.1.2 Name and address of firm preparing attached financial statement, and date thereof.

5.1.3 Is the attached financial statement for the identical organization named on page one?

5.1.4 If not, explain the relationship and financial responsibility of the organization whose financial statement is provided (e.g., parent-subsidiary).

5.2 Will the organization whose financial statement is attached act as guarantor of the contract for construction?

6. SIGNATURE

6.1 To be executed by a Principal of the firm authorized to certify the foregoing information:
_____, being duly sworn, deposes and says that the information provided herein is true and sufficiently complete so as not to be misleading.

6.2 Dated at _____ this _____ day of _____, 20____.

Name of Organization: _____

By: _____

(Printed Name)

Title: _____

BID PROPOSAL CHECKLIST (packet should be submitted unbound and unstapled)

Section 00100/00300	1. <u>MANDATORY</u> : Signed Bid Form with all blanks filled in, including acknowledgement of any issued addenda and names of all Subcontractors and Suppliers.
Section 00100/00300	2. <u>MANDATORY</u> : Original and Notarized Bid Security or Bond
Section 00100/00300	3. <u>MANDATORY</u> : Certificate of Insurance Availability
Section 00100/00300	4. <u>MANDATORY</u> : Names and categories (SMLB, MBE OR WBE) of all Subcontractors and Suppliers with SMLB, MBE OR WBE certifications
Section 00100/00310	5. <u>MANDATORY</u> : Evidence of Good Faith Efforts if Minority Participation Goals are not met
Section 00100/00302	6. <u>MANDATORY</u> : Texas Ethics Commission requirement, "Certificate of Interested Parties", Form 1295 – Contractor must have registered/completed on-line application
Section 00100/00301	7. <u>MANDATORY</u> : Safety Record (Qualifying Projects only)
Section 00100/00303	8. <u>MANDATORY</u> : Statement of Residency
Section 00100/00304	9. <u>MANDATORY</u> : Statement of Non-Divestment from Israel
Section 00100/00300	10. <u>MANDATORY</u> : Electronic version of the bid, containing a copy of the full bid package submitted on a USB Drive.
Section 00100/00300	11. <u>MANDATORY</u> : Provide one original and three hard copies of the bid proposal submitted.
	12.

POST-BID/PRE-AWARD CHECKLIST

Section 00100/00800 00810/00850	1. <u>MANDATORY</u> : Evidence of Worker's Compensation Insurance Coverage: a Certificate of Insurance or Form DWC-81, DWC-82, DWC-83, DWC-84, DWC-85 or if self-insured, a coverage agreement filed with the Texas Worker's Compensation Commission's Division of Self Insurance Regulation.
Section 00100/00800 /00810	2. <u>MANDATORY</u> : If employees provided by leasing company, evidence of Texas State License and copy of their Worker's Compensation policy. If no leased employees will be used, provide a letter on Contractor's letterhead stating so.
Section 00100	3. <u>MANDATORY</u> : Financial Statements
Section 00100	5. <u>MANDATORY</u> : Qualification Statement and Qualifications of Key Personnel (included in Section 00100)
Section 00100/00300	6. <u>MANDATORY</u> : Updated Minority Certification and Participation Summary

SECTION 00300

BID FORM

- B. BIDDER has familiarized itself with the nature and extent of the Contract Documents, Work, site, locality, and all local conditions and Laws and Regulations that in any manner may affect cost, progress, performance, or furnishing of the Work.
 - C. BIDDER has studied carefully all reports and drawings of subsurface conditions and drawings of physical conditions which are identified in the Supplementary Conditions as provided in Paragraph 5.03 of the General Conditions, and accepts the determination set forth in Paragraph SC-5.03 of the Supplementary Conditions of the extent of the technical data contained in such reports and drawings.
 - D. BIDDER has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests and studies (in addition to or to supplement those referred to in "C." above) which pertain to the subsurface or physical conditions at the site or otherwise may affect the cost, progress, performance or furnishing of the Work as BIDDER considers necessary for the performance or furnishing of the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of Paragraph 5.03 of the General Conditions.
 - E. BIDDER has reviewed and checked all information and data shown or indicated on the Contract Documents with respect to existing Underground Facilities at or contiguous to the site and assumes responsibility for the accurate location of said Underground Facilities.
 - F. BIDDER has correlated the results of all such observations, examinations, investigations, explorations, tests, reports, and studies with the terms and conditions of the Contract Documents.
 - G. BIDDER has given ENGINEER written notice of all conflicts, errors, or discrepancies that it has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to BIDDER.
 - H. This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; BIDDER has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; BIDDER has not solicited or induced any person, firm or corporation to refrain from bidding; and BIDDER has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.
 - I. All prices quotes by the bidder shall be entirely in United States Currency (U.S. Dollars).
4. Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

***** HIGH IMPORTANCE *****
TEXAS ETHICS COMMISSION REQUIREMENT

*****IN THE EVENT YOU RECEIVE AN AWARD OF THIS CONTRACT*****

Reference: FORM 1295 (revised 12/22/17) "Certificate of Interested Parties"

A business entity must file Form 1295 electronically with the Texas Ethics Commission using the Commission's online filing application, which can be found at:

https://www.ethics.state.tx.us/whatsnew/elf_info_form1295.htm

SEE INSTRUCTIONS: Form 1295 and Sample Form 1295 (Section 00302)

Item No.	Estimated Quantity	UOM	Brief Description of Item	Unit Bid Price	Extended Amount (Qty. x Unit Price)
1.	1	L.S.	Mobilization, Insurance, Bonds, and Move-In Related Expenses, Not to Exceed 5% of Bid Item Nos. 2 through 22. If Item No. 1 exceeds 5%, bid may be deemed non-responsive).	\$	\$
2.	1	L.S.	Furnish and Provide Pre-Construction Video, Complete in Place	\$	\$
3.	7	MO	Furnish and Install and Maintain Traffic Control, Complete in Place	\$	\$
4.	1	L.S.	Furnish and Install and Maintain SWPPP, Complete in Place	\$	\$
5.	350	LF	Removal and Proper Disposal of Existing CTB	\$	\$
6.	2	EA	Removal and Proper Disposal of Existing Barricades	\$	\$
7.	1	EA	Removal and Proper Disposal of Existing Wooden Post	\$	\$
8.	80	LF	Removal and Proper Disposal of Existing Metal Beam Guardrail Fence and Wooden Posts	\$	\$
9.	18	SY	Removal and Proper Disposal of Existing Sidewalks	\$	\$
10.	36	LF	Removal and Proper Disposal of Existing Curb and Gutter	\$	\$
11.	30,084	CY	Excavation of Channel, Unclassified Material	\$	\$
12.	5,370	CY	Furnish and Install Select Fills for Embankment of Channel, Complete in Place	\$	\$
13.	21,470	SY	Furnish and Install Loose Rip Rap to Fill Soil Stabilization System (2" Nominal), Complete in Place	\$	\$
14.	6,773	SY	Furnish and Install Gabion Rock Mattress, Complete in Place	\$	\$
15.	1,230	CY	Furnish and Install Gabion Weir Structures, Complete in Place	\$	\$
16.	13,537	SY	Furnish and Install Mortar Rock Rip Rap, Complete in Place	\$	\$

Item No.	Estimated Quantity	UOM	Brief Description of Item	Unit Bid Price	Extended Amount (Qty. x Unit Price)
17.	348	SY	Furnish and Install Articulated Block Concrete, Complete in Place	\$	\$
18.	2	EA	Furnish and Install Swing Access Gate, Complete in Place	\$	\$
19.	51	SY	Furnish and Install Concrete Driveway, Complete in Place	\$	\$
20.	134	LF	Furnish and Install Wrought Iron Fence, Complete in Place	\$	\$
21.	14	SY	Furnish and Install Asphalt Pavement, Complete in Place	\$	\$
22.	21,470	SY	Furnish and Install Soil Stabilization System, Complete in Place	\$	\$
23.	1	N.T.E.	Allowance for Additional Work Deemed Necessary by Owner to Complete Project	\$400,000	\$400,000

TOTAL BID PRICE (ITEMS 1 THROUGH 23) \$ _____

Quantities are not guaranteed.

If multiple awards are contemplated under a single bid document, an additional breakdown of bid amounts, subcontractors, and suppliers is required. It will also be necessary to adjust the MWBE Certification and Participation Summary Form accordingly.

In accordance with Section 151.311 of the Texas Tax Code (V.A.T.C.S.), regarding taxes on materials and services, and requiring a separated contract, the following is the breakdown of cost for materials and cost for labor for this bid:

MATERIALS TO BE INCORPORATED IN PROJECT NOT SUBJECT TO SALES TAX: \$ _____

LABOR TO BE INCORPORATED IN PROJECT NOT SUBJECT TO SALES TAX: \$ _____

RENTAL EQUIPMENT AND OTHER TAXABLE ITEMS: \$ _____

OTHER (I.E. BONDS, INSURANCE, CAPITAL EQUIPMENT, ETC.) \$ _____

***TOTAL CONTRACT: \$ _____**
***(TOTAL MUST EQUAL TOTAL BID PRICE)**

- BIDDER agrees that the Work will be Substantially completed within **180** Calendar Days from the date when the Contract Time commences to run as provided in Paragraph 2.03 of the General Conditions, and as revised in Supplementary Conditions, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions, and as revised in the Supplementary Conditions, within **210** calendar days. Final completion includes CONTRACTOR'S resolution of all punch list items and CONTRACTOR'S submission of required close-out documentation. Any failure of the CONTRACTOR to complete the project within the contract time will be considered a material breach of this contract.

BIDDER accepts the provisions of the Supplementary Conditions and the Agreement as to liquidated damages in the event of failure to complete the Work on time.

6. BIDDER MUST ANSWER THE FOLLOWING QUESTIONS: (Refer to INSTRUCTIONS TO BIDDERS for definitions.)

- A. Is the bidder that is making and submitting this bid a "RESIDENT BIDDER" or a "NONRESIDENT BIDDER"?

Answer: _____

- B. If the bidder is a "NONRESIDENT BIDDER", does the state in which the Nonresident Bidder's principal place of business is located have a law requiring a Nonresident Bidder of that state to bid a certain amount of percentage under the bid or a Resident Bidder of that state in order for the nonresident bidder of that state to be awarded a contract on his or her bid in such state?

Answer: _____

- C. If the answer to the question in Paragraph 6B above is "yes", then what amount or percentage must a Texas Resident Bidder bid under the bid of a Resident Bidder of that state in order to be awarded a contract on such bid in said state?

Answer: _____

7. The following documents are attached to and made a condition of this Bid:

- A. Required Bid Security in the form of _____

- B. A tabulation of all Subcontractors who will provide labor at the site of the work or render services to the CONTRACTOR in or about the construction of the work and Suppliers and other persons and organizations is required to be identified in this Bid. Complete the following table, designating each as Small Locally-Owned Business Enterprise (SLBE), Minority Business Enterprise (MBE), Women-Owned Business Enterprise (WBE), or Other (not either SLBE, WBE MBE) is required. Only one category may be checked. Include the work item and value of work to be provided by the Prime Contractor, as well as its category.

Tabulation of Subcontractors and Suppliers

SUBCONTRACTOR/SUPPLIER	WORK ITEM	SUBCONTRACT OR PURCHASE ORDER VALUE <small>(If value is unknown, please list <i>Pending</i>)</small>	S L B E	M B E	W B E			O T H E R
Prime Contractor:								

C. Will the Contractor meet the Small Locally Owned Business Enterprise, Minority Business Enterprise and Women-Owned Business Enterprise goals as required by these contract documents and the funding agencies?

YES _____ NO _____

If "YES", include above each of the firms to be used, their business status as a SLBE, MBE, or WBE, the proposed dollar value and type of work to be performed.

If "NO", documentation supporting good faith effort is required.

8. Communications concerning this Bid shall be addressed to the following named individual, address, telephone number, facsimile number, and e-mail address:

Name: _____

Address: _____

Phone: _____ Fax: _____ E-mail: _____

9. The terms used in this Bid which are defined in the General Conditions of the Construction Contract included as part of the Contract Documents have the meanings assigned to them in the General Conditions.

SUBMITTED on _____, 20__.

If BIDDER is:

An Individual

By _____ (SEAL)
(Name of Bidder)

(Title) (Signature)

doing business as _____

Business Address: _____

Phone No.: _____

A Partnership

By _____ (SEAL)
(Firm Name)

(Signature - general partner)

Business Address: _____

Phone No.: _____

A Corporation (Revised 10/12/92, 1/7/93, 4/13, 3/1/22)

By _____
(Corporation Name)

(State of Incorporation and State of Principal Place of Business)

By _____
(Name of Person Authorized to Sign)

(Title) (Signature)

(Corporate Seal)

Attest _____
(Secretary)

Business Address: _____

Phone No.: _____

Federal Tax Identification Number: _____

When proposing as a Corporation, Bidder swears and affirms by signing this Bid that the proposing Corporation is currently in existence, is currently authorized to do business in the State of Texas (or State of incorporation) and that no franchise tax reports or payments are delinquent as of the date of this Bid Proposal. The Bidder will provide a Certificate of Account Status with the signed Contract Documents. See Section 00510, for the sample form which is to be obtained by the successful Contractor from the Texas (or other state) Comptroller of Public Accounts and submitted as part of the final, executed Contract Documents.

CERTIFICATION OF INSURANCE AVAILABILITY

Date _____

I, _____ (Name of Insurance Agent), certify that I have reviewed the insurance requirements listed in Article 5 of the Supplementary Conditions of the specifications for the Arroyo 1 Dam Detention Improvements, Bid No. SW-1840, and further certify that _____ (Name of Bidder) has or can obtain the insurance coverage required by this Project so that a certificate of insurance and a copy(s) for the actual insurance policies can be submitted to the Owner within ten (10) days of the Notice of Award.

Signed _____

Title _____

Insurance Agency _____

Address _____

Telephone _____

**MINORITY CERTIFICATION
AND
PARTICIPATION SUMMARY**
(EPWU CIP FUNDED PROJECTS)

BID NUMBER: SWCSP 64-23

BID TITLE: Arroyo 1 Dam Detention Improvements

I certify that the Small Locally Owned Businesses (SLBE), Minority (MBE) and Women's Business Enterprises (WBE) participating in this project are qualified in accordance with the Minority requirements included in the above listed Bid Documents and that we will ensure all consultants, contractors, suppliers, and subcontractors will comply with the Minority guidelines. Definitions of each category are found in the 00100, Instructions to Bidders Section. Attached are:

Solicitation Documents: _____

Proposed Subcontracts for the below listed firms: _____

SLBE, MBE, or WBE FIRM NAME	ADDRESS	PHONE	CONTRACT AMOUNT	SLBE	MBE	WBE

The attached documents outline the Good Faith Effort taken in complying with the Minority Guidelines.

CONTRACTOR

SIGNATURE OF AUTHORIZED REPRESENTATIVE

DATE

PRINTED NAME OF AUTHORIZED REPRESENTATIVE

SECTION 00301
CONTRACTOR PRE-QUALIFICATION FORM

CONTRACTOR PRE-QUALIFICATION FORM

EPWater requires any contractor who will work on EPWater Qualifying Projects, as well as subcontractors performing 20% of the work on a Qualifying Project, to demonstrate their ability to work safely. A Qualifying Project is a project with a value greater than \$100,000 or one that the Chief Technical Officer and Vice President of Operations and Technical Services determine poses a significant hazard. This procedure allows EPWater to identify contractors that can perform site activities without compromising the safety or health of EPWater personnel.

Any contractor wishing to perform work on any Qualifying Project must complete this form and return with the bid package.

The information contained on this form will be evaluated and considered as a part of the overall selection process. Contractors who do not complete and submit this form will be considered non-responsive for any work they propose.

As part of this process, Contractors must certify that its employees have, or will have, appropriate training on the following subjects:

- Basic health and safety issues,
- the Contractor's health and safety programs, and
- the methods and techniques the Contractor will use on the project,
- Procedures for Contractor entrance into and exit from the area of work, and
- Informing EPWater about any unique hazards presented by the Contractor's work or found as a result of the Contractor's work.

Although EPWater will not ask for training documentation on each employee, EPWater requires that this documentation be available within twenty-four hours of request.

CONTRACTOR PRE-QUALIFICATION FORM

1.0 Company Name: _____
Address of Principal Place of Business: _____
Street: _____
City, State, Zip: _____
Telephone Number: _____
E-Mail: _____

2.0 Other Company Names Used: _____

3.0 Name(s) and Relationships of Parent Company, Affiliates, Subsidiaries, Partners:
Company: _____
Address: _____
City, State, Zip: _____
Relationship: _____
Company: _____
Address: _____
City, State, Zip: _____
Relationship: _____

4.0 Has the ownership in your company changed within the last three years? If so, please indicate who the previous owner was in the space below.
YES _____ NO _____

5.0 Please attach certificates showing the extent of coverage, exclusions, and deductibles for the following:

- General Business Liability Insurance Coverage
- Contractors Pollution Liability Insurance Coverage
- Professional Liability Insurance (limits and exclusions)
- Workers' Compensation Insurance Coverage

5.1 How long have you been covered by your current provider of Worker Compensation Insurance?

CONTRACTOR PRE-QUALIFICATION FORM

6.0 Please transfer the numbers and rates of injuries and illnesses from your firm's OSHA No. 300 Logs to the table below:

Injuries & Illnesses in Year:	2019		2020		2021	
Type of Injury Statistic	#	Rate	#	Rate	#	Rate
Lost Workday Cases						
Restricted Workday Cases						
Medical Treatment (not First Aid) Cases						
Total Illness Cases						
Total Recordable Cases						
Employee Hours Worked in Year:						

6.1 List any fatalities your company has had in the last three calendar years (January-December). Include location, cause, and corrective action.

7.0 Do you require that documented safety meetings be held for:

- a. Field Supervisor? Yes ___ No ___ Frequency _____
- b. Employees? Yes ___ No ___ Frequency _____
- c. New Hires? Yes ___ No ___ Frequency _____
- d. Subcontractors? Yes ___ No ___ Frequency _____

8.0 Will a corporate representative audit safety practices on this job?

YES _____ NO _____

8.1 Name _____ Title _____

8.2 How frequently will the representative visit the project? _____

8.3 Does the representative have the authority to take corrective action? Yes ___ No ___

8.4 To whom does the representative report?

Name _____ Title _____

CONTRACTOR PRE-QUALIFICATION FORM

9.0 Does the company have a health and safety plan? If yes, please give details.

10.0 Describe the type and extent of training Contractor employees will have.

10.1 What percentage of those employees will have this training? _____

11.0 Please give the name of the company's health and safety officer, if any.

12.0 Attach a list of any State or Federal Health and Safety citations received in the past three years.

13.0 Signature of Company Officer: _____

Title: _____

Date: _____

SECTION 00302

CERTIFICATE OF INTERESTED PARTIES SAMPLE

INSTRUCTIONS – FORM 1295

*****IN THE EVENT YOU RECEIVE AN AWARD OF THIS CONTRACT*****

Effective January 1, 2016, a governmental entity may not enter into a contract requiring Board approval, unless the business entity submits a Disclosure of Interested Parties (Form 1295) prior to the convening Board awarding the contract.

The following definitions apply:

1. “Interested Party” means a person:
 - a. Who has a controlling interest in a business entity with whom a governmental entity contracts, or;
 - b. Who actively participates in facilitating the contract or negotiating the terms of the contract, including a broker, intermediary, adviser, attorney, or representative of, or agent for, the business entity.

2. “Intermediary” means a person who actively participates in the facilitation of the contract or negotiating the contract, including a broker, adviser, attorney, or representative of, or agent for, the business who:
 - a. Receives compensation from the business entity for the person’s participation;
 - b. Communicates directly with the governmental entity or state agency on behalf of the business entity regarding the contact, and;
 - c. Is not an employee of the business entity.

3. “Business Entity” means any entity, recognized by law, through which business is conducted, including a sole proprietorship, partnership, or corporation. “Business entity includes a for-profit or non-profit entity. The term does not include a governmental entity or state agency.

4. “Contract” includes an amended, extended, or renewed contract.

5. “Controlling Interest” means:
 - a. An ownership interest or participating interest in a business entity by virtue of units, percentage, shares, stock, or otherwise, that exceeds ten (10) percent;
 - b. Membership on the board of directors or other governing body of a business entity of which the board or other governing body is composed of not more than ten (10) members, or;
 - c. Service as an officer of a business entity that has four (4) or fewer officers, or serve as one of the four (4) officers most highly compensated by a business entity that has more than four (4) officers.

A business entity must file Form 1295 electronically with the Texas Ethics Commission using the Commission’s online filing application, which can be found at:

https://www.ethics.state.tx.us/whatsnew/elf_info_form1295.htm

The business entity must print a copy of the completed form, which will include a certification of filing containing a unique certification number. “Section 6 - Unsworn Declaration” of Form 1295 must be signed by an authorized agent of the business entity. The business entity must then submit the completed, signed Form 1295 to El Paso Water.

CERTIFICATE OF INTERESTED PARTIES

FORM 1295

Complete Nos. 1 - 4 and 6 if there are interested parties.
 Complete Nos. 1, 2, 3, 5, and 6 if there are no interested parties.

OFFICE USE ONLY

1 Name of business entity filing form, and the city, state and country of the business entity's place of business.

2 Name of governmental entity or state agency that is a party to the contract for which the form is being filed.

3 Provide the identification number used by the governmental entity or state agency to track or identify the contract, and provide a description of the services, goods, or other property to be provided under the contract.

4 Name of Interested Party	City, State, Country (place of business)	Nature of Interest (check applicable)	
		Controlling	Intermediary

5 Check only if there is NO Interested Party.

6 UNSWORN DECLARATION

My name is _____, and my date of birth is _____.

My address is _____, _____, _____, _____, _____.
(street) (city) (state) (zip code) (country)

I declare under penalty of perjury that the foregoing is true and correct.

Executed in _____ County, State of _____, on the _____ day of _____, 20____.
(month) (year)

 Signature of authorized agent of contracting business entity
 (Declarant)

ADD ADDITIONAL PAGES AS NECESSARY

SECTION 00303
STATEMENT OF RESIDENCY

STATEMENT OF RESIDENCY

The following information is required by El Paso Water Utilities – Public Service Board (“EPWU”) in order to comply with the provisions of Texas Government Code §§ 2252.001 *et. seq.* Failure to provide the required information may constitute a basis for rejection of your bid. Bidders’ cooperation in this regard will avoid costly time delays in the award of bids by EPWU. Failure to provide all required information may result in the apparent low bidder being considered non-responsive and non-responsible, and the second low bidder being considered for award.

Definitions

Resident Bidder: a person whose principal place of business is in the State of Texas, including a contractor whose ultimate parent company or majority owner has its principal place of business in the State of Texas.

Nonresident Bidder: a person who is not a resident.

Principal Place of Business in Texas: a permanent business office located in Texas from which a bid is submitted and from which business activities are primarily conducted for the organization other than submitting bids to governmental agencies, where at least one employee works for the business entity.

Bidder’s Complete Company Name: _____

State the address of your principal place of business in the space provided below:

State the nature of the business conducted at your principal place of business in the space provided below:

State the number of employees you have at your principal place of business: _____

I swear and attest that the information provided above is true and correct as of the date _____ (“Bidder”) submitted its bid on Bid No. SWCSP 64-23. I further attest that I am an authorized representative of Bidder or have been duly authorized to represent Bidder in this matter. I understand that the information provided is being relied on by EPWU in order for it to comply with state purchasing laws and will materially affect its decisions in this regard. Should the information provided be false or materially misleading, any contract entered into between EPWU and Bidder will be void and EPWU may pursue any legal claims it may have against Bidder.

[SIGNATURE ON NEXT PAGE]

By: _____

Name: _____

Title: _____

Company: _____

ACKNOWLEDGMENT

STATE OF _____ §

§

COUNTY OF _____ §

This instrument was acknowledged before me on the ____ day of _____, 20____, by _____, as _____ of _____, a _____.

Notary Public, State of _____

My Commission Expires:

SECTION 00304

STATEMENT OF NON-DIVESTMENT FROM ISRAEL

SECTION 00310
MWBE SAMPLE SOLICITATION DOCUMENTS

The logo for ACME CONSTRUCTION features the company name in white, bold, uppercase letters inside a blue oval. A yellow swoosh underline is positioned above the oval.

ACME CONSTRUCTION

**10518 Burr Oak Drive
San Antonio, Texas 78609**

512-557-7089
Fax 512-557-2097

January 5, 2008

CERTIFIED MAIL / RETURN RECEIPT REQUESTED

Amazing Results Landscape and Supply Company
111 Red Rock Terrace
Lignite, Texas 72533

Gentlemen:

We are actively seeking MWBE Contractors and suppliers for work to be done under Project Number 123456, Sewer System Improvements, City of Anywhere, Texas. The work will consist of utility worm, concrete, paving, fencing, landscaping, masonry, excavation and trucking, barricades, back-hoe work and supplies and materials.

Plans and specifications may be viewed or obtained at the project engineer's general offices, Bing, Campbell and Associates, 19510 Jackson Blvd., Muleshoe, Texas 76698.

All bids must be submitted to the above mentioned address by Noon, Friday, February 16, 2008.

Sincerely,

John Q. Doe, Project Director
Acme Construction



Amazing Results
Landscaping

January 12, 2008

Mr. John Q. Doe, Project Director
Acme Construction
10518 Burr Oak Drive
San Antonio, Texas 78609

RE: PROJECT NO. 123456, ANYWHERE TEXAS SEWER SYSTEM IMPROVEMENTS PROJECT

Dear Mr. Doe:

We wish to submit the following bid for the above mentioned project:

St. Augustine sod – 900 square yards at \$1.75 per square yard
(Includes installation, rolling, fertilizing, and days of watering) \$1,575.00

Hydro-Mulch – 15 acres at \$1,175 per acre \$17,625.00
(5-acre minimum pre trip; No water; No maintenance; areas that do not
germinate will be reseeded) Proper watering is the responsibility of
customer.

Hay Bales – We will furnish and install at a rate of \$15.00 per bale

We look forward to hearing from you concerning our bid. Thank you.

Sincerely,

Theodore T. "Red" Robbins
Manager

*** A Certified MBE FIRM ***

1111 Red Rock Terrace
Lignite, Texas 72533
(512) 489-5678 (800) 549-0000
(512) 489-5679 fax
www.amazingresults.com

The logo for ACME CONSTRUCTION features the company name in white, bold, uppercase letters inside a blue oval. A yellow swoosh underline is positioned above the oval, extending from the left side of the page towards the right.

ACME CONSTRUCTION

**10518 Burr Oak Drive
San Antonio, Texas 78609**

512-557-7089
Fax 512-557-2097

January 5, 2008

CERTIFIED MAIL / RETURN RECEIPT REQUESTED

Rider Excavation Services
7856 Dry Gulch
Little Indian Mound, Texas 74561

Gentlemen:

We are actively seeking MWBE Contractors and suppliers for work to be done under Project Number 123456, Sewer System Improvements, City of Anywhere, Texas. The work will consist of utility worm, concrete, paving, fencing, landscaping, masonry, excavation and trucking, barricades, back-hoe work and supplies and materials.

Plans and specifications may be viewed or obtained at the project engineer's general offices, Bing, Campbell and Associates, 19510 Jackson Blvd., Muleshoe, Texas 76698.

All bids must be submitted to the above mentioned address by Noon, Friday, February 16, 2008.

Sincerely,

John Q. Doe, Project Director
Acme Construction



January 8, 2008

Mr. John Q. Doe, Project director
Acme Construction
10518 Burr Oak Drive
San Antonio, Texas 78609

RE: PROJECT NO. 123456
ANYWHERE TEXAS SEWER SYSTEM IMPROVEMENTS PROJECT

Dear Mr. Doe:

Thank you for your letter of January 5, 2008 requesting bids for the Anywhere, Texas Sewer System Improvements Project. We will not be submitting a bid because we are scheduled to begin work on another project that is projected to start on approximately the same date as ours.

We appreciate the opportunity to participate in your project. Please contact us again for any future projects.

Sincerely,

Easy Rider President
Rider Excavation Services

The logo for ACME CONSTRUCTION features the company name in white, uppercase letters inside a blue oval. A yellow swoosh underline is positioned above the oval, extending from the left side of the page towards the right.

ACME CONSTRUCTION

**10518 Burr Oak Drive
San Antonio, Texas 78609**

512-557-7089
Fax 512-557-2097

January 5, 2008

CERTIFIED MAIL / RETURN RECEIPT REQUESTED

Shadow Paving
P. O. Box 903
Pharr, Texas 72579

Gentlemen:

We are actively seeking MWBE Contractors and suppliers for work to be done under Project Number 123456, Sewer System Improvements, City of Anywhere, Texas. The work will consist of utility worm, concrete, paving, fencing, landscaping, masonry, excavation and trucking, barricades, back-hoe work and supplies and materials.

Plans and specifications may be viewed or obtained at the project engineer's general offices, Bing, Campbell and Associates, 19510 Jackson Blvd., Muleshoe, Texas 76698.

All bids must be submitted to the above mentioned address by Noon, Friday, February 16, 2008.

Sincerely,

John Q. Doe, Project Director
Acme Construction

SHADOW PAVING



January 8, 2008

Acme Construction
John Q. Doe, Project Director
10518 Burr Oak Dr.
San Antonio, TX 78609

Dear Mr.Doe:

Thank you for your letter of January 5, 2008 requesting a bid for the paving portion of the Anywhere, Texas Sewer System Improvements Project. Because of the distance of the project from our offices, we will not be interested in submitting a bid.

We appreciate your interest in our services. Please keep us in mind for future projects that may require expertise and services.

Sincerely,

Elmer A. Paver
Office Manager, Shadow Paving

The logo for ACME CONSTRUCTION features the company name in white, bold, uppercase letters inside a blue oval. A yellow swoosh underline is positioned above the oval, extending from the left side of the page towards the right.

ACME CONSTRUCTION

**10518 Burr Oak Drive
San Antonio, Texas 78609**

512-557-7089
Fax 512-557-2097

January 5, 2008

CERTIFIED MAIL / RETURN RECEIPT REQUESTED

Construction Trades Newsletter
100 Someplace Dr.
P. O. Box 500
Anywhere, Texas 08654

Attn: Ms. Glory Everett, Editor

Dear Ms. Everett:

Please publish the following in the "Public Notices" section of your weekly newsletter on the following dates: 1/11/08; 1/18/08; 1/25/08; and 2/1/08.

"Acme Construction is soliciting subcontract and material bids in connection with the Improvements to the Sewer System for the City of Anywhere, Texas. Qualified MBE and WBE firms are encouraged to submit bids in response to this invitation. The work will consist of utility work, concrete, paving, fencing, landscaping, masonry, excavation and trucking, barricades, back-hoe work and supplies and materials. Plans and specifications may be viewed or obtained at the project engineer's general offices, Bing, Campbell and Associates, 19510 Jackson Blvd., Muleshoe, Texas 76698. Telephone No. 512-557-2091, Fax 512-557-2090. All bids must be submitted to the above mentioned address by Noon, Friday, February 16, 2008".

Please bill Acme Construction, 10518 Burr Oak Drive, San Antonio, Texas 78609. The person authorizing the placement of this ad is B. J. Tenfold. If you have any questions, you may contact Mr. Tenfold at 512-557-7000.

Sincerely,

B. J. Tenfold
Manager of Accounts



**10518 Burr Oak Drive
San Antonio, Texas 78609**

512-557-7089
Fax 512-557-2097

January 5, 2008

CERTIFIED MAIL / RETURN RECEIPT REQUESTED

Anywhere Weekly Courier
1111 Main Street
P. O. Box 1
Anywhere, Texas 08654

Attn: Mr. Bucky Beaver, Circulation Manager

Dear Mr. Beaver:

Please publish the following in the "Public Notices" section of your weekly newspaper editions on the following dates: 1/11/08; 1/18/08; 1/25/08; and 2/1/08.

"Acme Construction is soliciting subcontract and material bids in connection with the Improvements to the Sewer System for the City of Anywhere, Texas. Qualified MBE and WBE firms are encouraged to submit bids in response to this invitation. The work will consist of utility work, concrete, paving, fencing, landscaping, masonry, excavation and trucking, barricades, back-hoe work and supplies and materials. Plans and specifications may be viewed or obtained at the project engineer's general offices, Bing, Campbell and Associates, 19510 Jackson Blvd., Muleshoe, Texas 76698. Telephone No. 512-557-2091, Fax 512-557-2090. All bids must be submitted to the above mentioned address by Noon, Friday, February 16, 2008".

Please bill Acme Construction, 10518 Burr Oak Drive, San Antonio, Texas 78609. The person authorizing the placement of this ad is B. J. Tenfold. If you have any questions, you may contact Mr. Tenfold at 512-557-7000.

Sincerely,

B. J. Tenfold
Manager of Accounts

THE STATE OF TEXAS }
COUNTY OF GHI }

Before me Homer Shortcut, a Notary Public in and for GHI County, Texas on this day personally appeared Bucky Beaver, Circulation Manager for Small Town Newspapers Group, Inc., publishers of the Anywhere Weekly Courier, who being by me duly sworn did depose and say that said newspaper has been published continuously for more than fifty-two weeks prior to the first insertion of this Legal Notice Number 879 at GHI County, Texas and the attached printed copy of the legal notice is a true copy of the original and was printed weekly on the following date(s): 1/11/08; 1/18/08; 1/25/08; 2/1/08.

Circulation Manager
Anywhere Weekly Courier
Small Town Newspaper Group, Inc.

Appeared and sworn to before me on this
21st day of January, 2008

NOTARY PUBLIC in and for the State of Texas
My Commission expires 12/28/2010

Legal Notice as Published

Acme Construction is soliciting subcontract and material bids in connection with the Improvements to the Sewer System for the City of Anywhere, Texas. Qualified MBE and WBE firms are encouraged to submit bids in response to this invitation. The work will consist of utility work, concrete, paving, fencing, landscaping, masonry, excavation and trucking, barricades, back-hoe work and supplies and materials. Plans and specifications may be viewed or obtained at the project engineer's general offices, Bing, Campbell and Associates, 19510 Jackson Blvd., Muleshoe, Texas 76698. Telephone No. 512-557-2091, Fax 512-557-2090. All bids must be submitted to the above mentioned address by Noon, Friday, February 16, 2008.

SECTION 00500
STANDARD FORM OF AGREEMENT
BETWEEN OWNER AND CONTRACTOR

SECTION 00500

**STANDARD FORM OF AGREEMENT BETWEEN OWNER
AND CONTRACTOR ON THE BASIS OF A STIPULATED PRICE**

THIS AGREEMENT is dated as of the _____ day of _____ in the year 20__ by and between El Paso Water Utilities-Public Service Board, a component unit of the City of El Paso, a Texas municipal corporation (hereinafter called OWNER), and _____ (hereinafter called CONTRACTOR). OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1. WORK

CONTRACTOR shall complete all Work as specified or indicated in the Contract Documents. The work is generally described as follows:

ARROYO 1 DAM DETENTION IMPROVEMENTS

The work under this contract shall be for furnishing all labor, materials, transportation and services for the construction and installation of the following work:

Excavate/reshape Arroyo 1 channel over approximately 1700 linear feet, comprising a new cut/fill of 30,100 CY. Install mortared rock rip-rap, gravel-filled soil stabilization system, articulated blocks, gabion mattress along the channel, and construct seven gabion basket weir drop structures. Construct a gravel-filled system maintenance access roadway for approximately 1900 linear feet.

ARTICLE 2. ENGINEER

The Project has been designed by Parkhill who is hereinafter called ENGINEER and who is to act as OWNER's representative, assume all duties and responsibilities and have the rights and authority assigned to ENGINEER in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

ARTICLE 3. CONTRACT TIME (Revised 9/2/92, 10/9/98, 6/3/99, 4/13, 10/16/20)

3.1 The Work will be Substantially completed within 180 Calendar Days from the date when the Contract Time commences to run as provided in Paragraph 4.01 of the General Conditions, and as revised in Supplementary Conditions, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions, and as revised in the Supplementary Conditions, within 210 calendar days. Final completion includes CONTRACTOR'S resolution of all punch

list items and CONTRACTOR'S submission of required close-out documentation. Any failure of the CONTRACTOR to complete the project within the contract time will be considered a material breach of this contract.

3.2 Liquidated Damages. OWNER and CONTRACTOR recognize that time is of the essence of this Agreement and that OWNER will suffer financial loss and public inconvenience if the Work is not completed and the submittals are not submitted within the times specified in Paragraph 3.1 above, plus any extensions thereof allowed in accordance with Article 11 of the General Conditions. They also recognize the delays, expense and difficulties involved in proving in a legal proceeding the actual loss suffered by OWNER if the Work is not completed on time. Accordingly, instead of requiring any such proof, OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as a penalty) CONTRACTOR shall pay OWNER the sum of One Thousand Eight Hundred Twelve and 26/100 dollars per day (\$1,812.26) for each Calendar Day that expires after the time specified in the Agreement for Substantial Completion until the Work is substantially complete. After Substantial Completion, if CONTRACTOR shall neglect, refuse or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by OWNER, CONTRACTOR shall pay OWNER One Thousand One Hundred Eighty One and 46/100 dollars per day (\$1,181.46) for each Calendar Day that expires after the time specified in the Agreement for completion and readiness for final payment.

For a project that includes interim Milestone Dates, insert language similar to the following:

ARTICLE 4. CONTRACT PRICE *(Revised 10/12/92, 6/7/93; 2/13/97)*

4.1 OWNER shall pay CONTRACTOR for completion of the Work in accordance with the Contract Documents in current funds, per the attached CONTRACTOR's Bid in accordance with the below listed separate charges:

MATERIALS TO BE INCORPORATED IN PROJECT NOT SUBJECT TO SALES TAX:	\$ _____
LABOR TO BE INCORPORATED IN PROJECT NOT SUBJECT TO SALES TAX:	\$ _____
RENTAL EQUIPMENT AND OTHER TAXABLE ITEMS:	\$ _____
OTHER (I.E. BONDS, INSURANCE, CAPITAL EQUIPMENT, ETC.)	\$ _____
*TOTAL CONTRACT:	\$ _____
* (TOTAL MUST EQUAL TOTAL BID PRICE)	

ARTICLE 5. PAYMENT PROCEDURES *(Revised 5/14/96, 7/13, 10/16/20, 3/4/22)*

CONTRACTOR shall submit Applications for Payment in accordance with Article 15 of the General Conditions and Article 15 of the Supplementary Conditions. Applications for Payment will be processed by ENGINEER as provided in the General Conditions.

- 5.1 Progress Payments. OWNER shall make progress payments on account of the Contract Price on the basis of CONTRACTOR's Applications for Payment as recommended by ENGINEER for Work which is completed in accordance with the terms and conditions of the Contract Documents. All progress payments will be on the basis of the progress of the Work measured by the schedule of values established in Paragraph 2.03 and referenced in Paragraph 2.05 of the General Conditions (and in the case of Unit Price Work based on the number of units completed and accepted) or, in the event there is no schedule of values, as provided in the General Requirements. Each invoice, regardless of contract type, shall contain a summary indicating the budget, the current invoiced amount, less a withholding of a 5% retainage amount, and the billed to date figure.

Prior to Substantial Completion, progress payments will be made in an amount equal to the percentages indicated below, but, in each case, less the aggregate of payments previously made and less such amounts as ENGINEER shall recommend, or OWNER may withhold, in accordance with Paragraph 15.06 of the General Conditions.

Ninety-five percent of Work completed (ninety percent for contracts under \$400,000.00), including 95 percent of materials and equipment not incorporated in the Work (but delivered, suitably stored and accompanied by documentation satisfactory to OWNER as provided in Paragraph 15.01 of the General Conditions).

- 5.2 Final Payment. Upon final completion and acceptance of the Work in accordance with Article 15 of the General and Supplementary Conditions, OWNER shall pay the remainder of the Contract Price as recommended by ENGINEER as provided in said Article.

ARTICLE 6. CONTRACTOR'S REPRESENTATIONS (Revised 10/12/92, 7/13, 11/9/17, 10/16/20, 3/4/22)

In order to induce OWNER to enter into this Agreement, CONTRACTOR makes the following representations:

- 6.1 CONTRACTOR has familiarized itself with the nature and extent of the Contract Documents, Work, site, locality, and all local conditions and Laws and Regulations that in any manner may affect cost, progress, performance or furnishing of the Work.
- 6.2 CONTRACTOR has studied carefully all reports of explorations and tests of subsurface conditions and drawings of physical conditions which are identified in the Supplementary Conditions as provided in Paragraph 5.03 of the General Conditions, and accepts the determination set forth in Paragraph SC-5.03 of the Supplementary Conditions of the extent of the technical data contained in such reports and drawings.
- 6.3 CONTRACTOR has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests, reports and studies (in addition to or to supplement those referred to in Paragraph 6.2 above) which pertain to the subsurface or physical conditions at or contiguous to the site or otherwise which may affect the cost, progress, performance or furnishing of the Work necessary for the performance or furnishing of the Work at the Contract Price, specifically within the provisions of Paragraph 5.03 of the General Conditions. CONTRACTOR understands that the correctness of such information is not guaranteed by the OWNER or the ENGINEER and CONTRACTOR understand(s) that the conditions encountered in performing the work may be different from the approximations shown.
- 6.4 CONTRACTOR has reviewed all information and data shown or indicated in the Contract

Documents with respect to existing Underground Facilities at or contiguous to the site and assumes responsibility for the location of said Underground Facilities as determined by his or her own field investigations. CONTRACTOR understands that the correctness of such information is not guaranteed by the OWNER or the ENGINEER and CONTRACTOR understand that the conditions encountered in performing the work may be different from the approximations shown.

- 6.5 CONTRACTOR has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.
- 6.6 CONTRACTOR has given ENGINEER written notice of all conflicts, errors, or discrepancies that he has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to CONTRACTOR.
- 6.7 CONTRACTOR affirms it is not a foreign-owned company that is owned or controlled by citizens of or directly controlled by the government of China, Iran, North Korea, Russia or a designated country pursuant to Chapter 2274 of the Texas Government Code. Additionally, CONTRACTOR affirms it is not a company that is headquartered in China, Iran, North Korea, Russia, or a designated country pursuant to Chapter 2274 of the Texas Government Code.
- 6.8 CONTRACTOR affirms it does not boycott Israel and will not boycott Israel during the term of the Agreement.
- 6.9 In accordance with Chapter 2274 of the Texas Government Code, CONTRACTOR affirms that it does not boycott energy companies and will not boycott energy companies during the term of the Agreement.
- 6.10 In accordance with Section 2274.002 of the Texas Government Code, CONTRACTOR affirms that it does not have a practice, policy, guidance or directive that discriminates against a firearm entity or firearm trade association and will not discriminate during the term of the Agreement against a firearm entity or firearm trade association.

ARTICLE 7. CONTRACT DOCUMENTS (Revised 11/16/94, 1/12/11, 7/13, 11/2/16, 10/16/20, 3/4/22)

The Contract Documents which comprise the entire agreement between OWNER and CONTRACTOR concerning the Work consist of the following:

- 7.1 CONTRACTOR's Bid (Section 00300)
- 7.2 Agreement (Section 00500)
- 7.3 Performance and Payment Bonds, and Certificate of Insurance, and insurance policies identified as Sections 00610, 00630 and 00650.
- 7.4 Notice of Award.
- 7.5 General Conditions (Section 00700)
- 7.6 Supplementary Conditions (Section 00800)
- 7.7 Supplement for Special-Funded Project (Section 00805) – IF APPLICABLE

- 7.8 General Wage Rates (Section 00840)
- 7.9 Specifications bearing the title Project Manual for the Construction of Arroyo 1 Dam Detention Improvements, consisting of division numbers 1 through 35 as listed in table of contents thereof.
- 7.10 Drawings consisting of a cover sheet and sheets listed in the Index to Drawings, each sheet bearing the following general title:

CITY OF EL PASO, TEXAS
EL PASO WATER UTILITIES - PUBLIC SERVICE BOARD

ARROYO 1 DAM DETENTION IMPROVEMENTS
#SWCSP 64-23

JUNE, 2023

(Drawings not attached to this Agreement.)

- 7.11 Addenda numbers _____ to _____, inclusive (not attached to this Agreement.)
- 7.12 Documentation submitted by CONTRACTOR prior to Notice of Award (Pages _____ to _____, inclusive).
- 7.13 Contractor Health and Safety Plan
- 7.14 The Instructions to Bidders, Information Available to Bidders, Bid Form and Bid Security, as well as any supplements to the Bid Form.
- 7.15 The following which may be delivered or issued after the Effective Date of the Agreement and are not attached hereto: All Written Amendments and other documents amending, modifying, or supplementing the Contract Documents pursuant to Paragraphs 11.01 of the General Conditions.
- 7.16 The documents listed in Paragraphs 7.2 et. seq. above are attached to this Agreement (except as expressly noted otherwise above).

There are no Contract Documents other than those listed above in this Article 7. The Contract Documents may only be amended, modified or supplemented as provided in Paragraphs 11.01 of the General Conditions.

ARTICLE 8. MISCELLANEOUS

- 8.1 Terms used in this Agreement which are defined in Article 1 of the General Conditions will have the meanings indicated in the General Conditions.
- 8.2 No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically, but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility

under the Contract Documents.

- 8.3 OWNER and CONTRACTOR each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect of all covenants, agreements and obligations contained in the Contract Documents.

ARTICLE 9. OTHER PROVISIONS *(Revised 3/4/22)*

- 9.1 It is agreed that should any dispute arise under this Contract which culminates in litigation, venue of that suit shall be in a court of competent jurisdiction sitting in El Paso County, Texas. The court shall apply the laws of the State of Texas in construing and interpreting the terms of this Contract and the Contract Documents.
- 9.2 In case any one or more of the provisions contained in this Agreement shall, for any reason, be held to be invalid, illegal, or unenforceable in any respect, that invalidity, illegality, unenforceability shall not affect any other provisions and this Agreement shall be construed as if such invalid, illegal, or unenforceable provisions had never been included, and the Agreement provisions shall be read and interpreted so as to harmonize with the Agreement itself.
- 9.3 The captions or headings of paragraphs in this Contract are for convenience only and shall not be considered in constraining the provisions hereof if any question of intent should arise.
- 9.4 For NADBank-funded projects, Contractor agrees to indemnify and hold harmless North American Development Bank (NADB) and each of its directors, officers, employees, agents and representatives (collectively, "NADB's Associated Persons") against all claims for death, personal injury, damages, or other relief against NADB or NADB's Associated Persons, including costs, expenses and attorney's fees, resulting from negligence or willful acts or failure to act by the Contractor.
- 9.5 In accordance with Sections 552.371 and 552.372 of the Texas Government Code, the following language is included, and applicable in contracts that require or result in the expenditure of public funds of at least \$1,000,000:

CONTRACTING INFORMATION. CONTRACTOR must preserve all contracting information related to this Agreement as provided by the records retention schedule requirements applicable to the OWNER for the duration of this Agreement. CONTRACTOR will promptly provide the OWNER any contracting information related to this Agreement that is in the custody or possession of the CONTRACTOR on request of the OWNER. On completion of this Agreement, CONTRACTOR will either provide at no cost to the OWNER all contracting information related to this Agreement that is in the custody or possession of the CONTRACTOR or preserve the contracting information related to this Agreement as provided by the records retention requirements applicable to the OWNER.

IN WITNESS WHEREOF, OWNER and CONTRACTOR have signed this Agreement in triplicate. One counterpart each has been delivered to OWNER, CONTRACTOR and ENGINEER. All portions of the Contract Documents have been signed or identified by OWNER and CONTRACTOR or by ENGINEER on their behalf.

This Agreement will be effective on _____, 20____.

OWNER: El Paso Water Utilities
Public Service Board of
the City of El Paso, Texas

CONTRACTOR: _____

By _____
Purchasing Agent

By _____
Name: _____
Title: _____

Address for giving notices:

1154 Hawkins Boulevard
El Paso, Texas 79925

Address for giving notices:

Date Signed _____

Date Signed _____

Federal Tax I.D. No. _____

Agent for service or process:

INSTRUCTIONS FOR EXECUTING CONTRACT

If the CONTRACTOR be a corporation, the following certificate should be executed:

I, _____, certify that I am the _____ of the corporation named as CONTRACTOR hereinabove; that, _____ who signed the foregoing Contract on behalf of the CONTRACTOR was then, _____ of said Corporation; that said Contract was duly signed for and in behalf of said Corporation by authority of its governing body and is within the scope of its corporate powers.

Corporate Seal

If the Contract is signed by the secretary of the corporation, the above certificate should be executed by some other officer of the corporation under the corporate seal. In lieu of the foregoing certificate, there may be attached to the Contract copies of so much of the records of the corporation as will show the official character and authority of the officers signing, duly certified by the Secretary or Assistant Secretary under the corporate seal to be true copies.

The full name and business address of the CONTRACTOR should be inserted and the Contract shall be signed with his or her official signature. Please have the name of the signing party or parties typewritten or printed under all signatures to the Contract.

If the CONTRACTOR should be operating as a partnership, each partner should sign the Contract. If the Contract is not signed by each partner, there should be attached to the Contract a duly authenticated Power of Attorney, or other appropriate resolution or document evidencing the signer's (signers') authority to sign such Contract for and in behalf of the partnership.

If the CONTRACTOR is an individual, the trade name (if the CONTRACTOR is operating under an assumed or trade name) should be indicated in the Contract and the Contract should be signed by such individual. If signed by one other than the CONTRACTOR, there should be attached to the Contract a duly authenticated Power of Attorney evidencing the signer's authority to execute such Contract for and in behalf of the CONTRACTOR.

CONTRACT SUBMITTAL CHECKLIST

(The following items must be submitted within **10** calendar days of the Notice of Award unless stated otherwise in the General or Supplemental Conditions)

1.	Executed Agreement
2.	Payment and Performance Bonds
3.	Insurance Certificate and Policies. Policies should be sent in electronic format to rguevara@epwater.org , with copy to becky.ramirez@hubinternational.com (Owner's Risk Manager) and to Purchasing.Info@epwater.org .
4.	If employees provided by leasing company, evidence of Texas State License and copy of their Worker's Compensation policy. If no leased employees will be used, provide a letter on Contractor's letterhead stating so.
5.	Certificate of Account Status (paid franchise taxes)
6.	Final/Updated (if applicable) Minority Certification and Participation Summary
7.	Preliminary Schedule of Values
8.	Preliminary Construction Schedule
9.	Schedule of Shop Drawings
10.	Trench Safety System (sealed by a Professional Engineer)
11.	Trench Safety Plan
12.	Stormwater Pollution Prevention Plan
13.	Traffic Control Plan
14.	Health and Safety Plan

- **Deliver all items to the OWNER's Purchasing Department**
- **Deliver electronic copies of items 7-14 to EPWater Project Manager**

SECTION 00510

CERTIFICATE OF ACCOUNT STATUS SAMPLE



TEXAS COMPTROLLER OF PUBLIC ACCOUNTS

SUSAN COMBS • COMPTROLLER • AUSTIN, TEXAS 78774

July 30, 2007

CERTIFICATE OF ACCOUNT STATUS

THE STATE OF TEXAS
COUNTY OF TRAVIS

I, Susan Combs, Comptroller of Public Accounts of the State of Texas, DO
HEREBY CERTIFY that according to the records of this office

is, as of this date, in good standing with this office having no franchise
tax reports or payments due at this time. This certificate is valid through
the date that the next franchise tax report will be due November 15, 2007.

This certificate does not make a representation as to the status of the
corporation's Certificate of Authority, if any, with the Texas Secretary of
State.

This certificate is valid for the purpose of conversion when the converted
entity is subject to franchise tax as required by law. This certificate is
not valid for the purpose of dissolution, merger, or withdrawal.

GIVEN UNDER MY HAND AND
SEAL OF OFFICE in the City of
Austin, this 30th day of
July 2007 A.D.

Susan Combs
Texas Comptroller

Taxpayer number:
File number:

Form 05-304 (Rev. 02-03/14)

SECTION 00610
PERFORMANCE BOND

TEXAS STATUTORY PERFORMANCE BOND

(Penalty of this Bond must be 100% of Contract Amount)

Public Work – State of Texas

STATE OF TEXAS }
COUNTY OF _____ }

BOND NUMBER _____

KNOW ALL MEN BY THESE PRESENTS:

That _____ (hereinafter called the Principal), as Principal and _____, a corporation organized and existing under the laws of the State of _____, and whose principal office is located in the City of _____, and duly authorized to do business in the State of Texas (hereinafter called the Surety).

As Surety, are held firmly bound unto El Paso Water Utilities / Public Service Board, hereinafter called the Owner), in the penal sum of _____ Dollars (\$_____) for the payment of which sum well and truly to be made, we bind ourselves, our heirs, administrators, executors, successors and assigns, jointly and severally, by these presents.

WHEREAS, the Principal has entered into a certain written Contract with the Owner, dated the _____ day of _____, 20____, a copy of which is hereto attached and made a part hereof, for _____.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH that if the said Principal shall faithfully perform the work in accordance with the plans, specifications and contract documents, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, HOWEVER, that this Bond is executed pursuant to the provisions of Chapter 2253 of the Texas Government Code and all liabilities on this Bond shall be determined in accordance with the provisions thereof to the same extent as if it were copied at length herein.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this _____ day of _____, 20____.

BY: _____
Principal

WITNESS:

BY: _____
Surety

SECTION 00630
PAYMENT BOND

PAYMENT BOND

Public Work – State of Texas

STATE OF TEXAS }
COUNTY OF _____ }

BOND NUMBER _____

KNOW ALL MEN BY THESE PRESENTS:

That _____ of the City of _____, County of _____ and State of _____ (hereinafter called the Principal), and _____ authorized under the laws of the State of Texas to act as Surety on bonds for Principals (hereinafter called the Surety) are held firmly bound unto El Paso Water Utilities / Public Service Board, hereinafter called the Owner), in the penal sum of _____ Dollars (\$ _____) for the payment whereof, the said Principal and Surety bind themselves and their heirs, administrators, executors, successors and assigns, jointly and severally, by these presents.

WHEREAS, the Principal has entered into a certain written Contract with the Owner, dated the _____ day of _____, 20____, for _____ to which Contract is hereby referred to and made part hereof as fully and to the same extent as if copied at length herein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH that if the said Principal shall pay all claimants supplying labor and material to him or a subcontractor in the prosecution of the work provided for in said Contract, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, HOWEVER, that this Bond is executed pursuant to the provisions of Chapter 2253 of the Texas Government Code and all liabilities on this Bond shall be determined in accordance with the provisions of said Chapter to the same extent as if it were copied at length herein.

Surety, for value received, stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract, or to the work performed thereunder, or the plans, specifications or drawings accompanying the same, shall in anywise affect its obligation on this Bond and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract, or to the work to be performed thereunder.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this _____ day of _____, 20____.

BY: _____
Principal

WITNESS:

BY: _____
Surety

SECTION 00650
CERTIFICATE OF LIABILITY INSURANCE

**SECTION 00660
ENGINEER'S CERTIFICATE OF
SUBSTANTIAL COMPLETION**



EL PASO WATER UTILITIES - PUBLIC SERVICE BOARD

ENGINEER'S CERTIFICATE OF SUBSTANTIAL COMPLETION

Arroyo 1 Dam Detention Improvements, BID NO. SWCSP 64-23

(TO BE FILLED OUT AND SUBMITTED BY ENGINEER)

The above-referenced project is substantially complete as of _____, 20____.
 Exceptions and/or items requiring additional work are indicated as follows:

The following documents are required contract submittals. Certificate of Final Completion and Final Payment will <i>not</i> be issued until all submittals listed below are received and correct (pursuant to contract requirements).	
1. Contractor's Waiver of Claim/Lien (GC 15.06.A.3)	
2. <i>Original</i> Consent of Surety to Final Payment (GC 15-06.A.2.a)	
3. Copy of Release to Contractor from EPWID#1 for Dewatering Fees, if applicable (SC 18.13.E)	
4. Completed Operations Insurance Letter (coverage for at least 2 years after final payment (GC 6.03.B.3 and SC-6.03.C.6)	
5. Delivery to the Engineer of all Operating & Maintenance Manuals, Guarantees, Certificates of Inspection, and Marked-up As-Builts or Record Drawings, if applicable (GC 10.07.D and GC 15.06.A.1)	
6. Final Report of Total Payments to subcontractors and suppliers	
7. Evidence of Payment of Final Water Bill and Return of Water Meter	
8. Ensure that <i>Certified</i> Payrolls for entire contract period for contractor and all subcontractors, including "Final" (SC 7.11.D.5) payroll from each, are entered in the Utility Automated Payroll Software program and ensure that all outstanding corrections and/or evidence of restitution have been submitted	
9. Warranty/Guarantee, if applicable	
10. NPDES Requirements (NOT), if applicable	

 EPWU Engineering Division Manager

 Project Engineer of Record

 Date

 Date

SECTION 00680
CONTRACTOR'S CLOSE-OUT CHECKLIST



CONTRACTOR'S PROJECT CLOSE-OUT SUBMITTALS CHECKLIST

The following documents are required contract submittals for the Close-Out of this project. Contractor is contractually required to submit the following in one packet to the Engineer for review. Certificate of Final Completion and Final Payment will not be issued until all submittals listed below are received and correct.

REQUIRED ITEM	INCLUDED
1. Final Change Order (if applicable)	
2. Contractor's Waiver of Lien (GC 15.06.A.3)	
3. <i>Original</i> Consent of Surety to Final Payment (GC 15.06.A.2.b)	
4. Copy of Release to Contractor from EPWID#1 for Dewatering Fees, if applicable (SC 18.13.E)	
5. Completed Operations Insurance Letter (coverage for at least 2 years after final payment (GC 6.03.B.3 and SC 6.03.C.6)	
6. Transmittal Letter of Delivery to Engineer of all Operating & Maintenance Manuals, Guarantees, Certificates of Inspection, and Marked-up As-Builts or Record Drawings, if applicable (GC 10.07.D and GC 15.06.A.1)	
7. Final Report of Total Payments to Subcontractors and Suppliers	
8. Final Certified Payrolls (list 'Final' atop the payrolls) (SC 7.11.D.5). Submit any and all outstanding corrections and/or evidence of paid restitution.	
9. Warranty/Guarantee, if applicable	
10. NPDES Requirements (NOT), if applicable	
11. Paid Final Water Bill, Completed Meter and Removal Forms for Fire Hydrant Meter	

* All items must be submitted and received as a complete packet. An incomplete packet will be returned.

When all items have been received and approved by EPWater, the assigned Project Compliance Specialist will notify Project Engineer, Consultant Engineer, and Contractor. At that time, Contractor may submit the Final Pay Application to Consultant Engineer. Consultant Engineer will provide the Certificate of Final Completion and the approvable Final Pay Application to the Project Compliance Specialist for processing and closing of project.

SECTION 00700
GENERAL CONDITIONS (EJCDC C0700, 2018 ED)

SECTION 00700 - STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
 3. *Application for Payment*—The document prepared by Contractor, in a form acceptable to Engineer, to request progress or final payments, and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 5. *Bidder*—An individual or entity that submits a Bid to Owner.
 6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
 7. *Bidding Requirements*—The Advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
 8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.
 9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.
 10. *Claim*
 - a. A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment of Contract Price or Contract Times; contesting an initial decision by Engineer concerning the

- requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract.
- b. A demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal, or seeking resolution of a contractual issue that Engineer has declined to address.
 - c. A demand or assertion by Owner or Contractor, duly submitted in compliance with the procedural requirements set forth herein, made pursuant to Paragraph 12.01.A.4, concerning disputes arising after Engineer has issued a recommendation of final payment.
 - d. A demand for money or services by a third party is not a Claim.
11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), lead-based paint (as defined by the HUD/EPA standard), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to Laws and Regulations regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
 12. *Contract*—The entire and integrated written contract between Owner and Contractor concerning the Work.
 13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.
 14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents.
 15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.
 16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.
 17. *Cost of the Work*—See Paragraph 13.01 for definition.
 18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.
 19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.
 20. *Electronic Document*—Any Project-related correspondence, attachments to correspondence, data, documents, drawings, information, or graphics, including but not limited to Shop Drawings and other Submittals, that are in an electronic or digital format.
 21. *Electronic Means*—Electronic mail (email), upload/download from a secure Project website, or other communications methods that allow: (a) the transmission or communication of Electronic Documents; (b) the documentation of transmissions, including sending and receipt; (c) printing of the transmitted Electronic Document by the

recipient; (d) the storage and archiving of the Electronic Document by sender and recipient; and (e) the use by recipient of the Electronic Document for purposes permitted by this Contract. Electronic Means does not include the use of text messaging, or of Facebook, Twitter, Instagram, or similar social media services for transmission of Electronic Documents.

22. *Engineer*—The individual or entity named as such in the Agreement.
23. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.
24. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto.
 - a. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated into the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, is not a Hazardous Environmental Condition.
 - b. The presence of Constituents of Concern that are to be removed or remediated as part of the Work is not a Hazardous Environmental Condition.
 - c. The presence of Constituents of Concern as part of the routine, anticipated, and obvious working conditions at the Site, is not a Hazardous Environmental Condition.
25. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and binding decrees, resolutions, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
26. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
27. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date, or by a time prior to Substantial Completion of all the Work.
28. *Notice of Award*—The written notice by Owner to a Bidder of Owner’s acceptance of the Bid.
29. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.
30. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.
31. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising Contractor’s plan to accomplish the Work within the Contract Times.
32. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.

33. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative (RPR) includes any assistants or field staff of Resident Project Representative.
34. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
35. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer’s review of the submittals.
36. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor’s Applications for Payment.
37. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.
38. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands or areas furnished by Owner which are designated for the use of Contractor.
39. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
40. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.
41. *Submittal*—A written or graphic document, prepared by or for Contractor, which the Contract Documents require Contractor to submit to Engineer, or that is indicated as a Submittal in the Schedule of Submittals accepted by Engineer. Submittals may include Shop Drawings and Samples; schedules; product data; Owner-delegated designs; sustainable design information; information on special procedures; testing plans; results of tests and evaluations, source quality-control testing and inspections, and field or Site quality-control testing and inspections; warranties and certifications; Suppliers’ instructions and reports; records of delivery of spare parts and tools; operations and maintenance data; Project photographic documentation; record documents; and other such documents required by the Contract Documents. Submittals, whether or not approved or accepted by Engineer, are not Contract Documents. Change Proposals, Change Orders, Claims, notices, Applications for Payment, and requests for interpretation or clarification are not Submittals.
42. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion of such Work.

43. *Successful Bidder*—The Bidder to which the Owner makes an award of contract.
44. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
45. *Supplier*—A manufacturer, fabricator, supplier, distributor, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
46. *Technical Data*
- a. Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (1) existing subsurface conditions at or adjacent to the Site, or existing physical conditions at or adjacent to the Site including existing surface or subsurface structures (except Underground Facilities) or (2) Hazardous Environmental Conditions at the Site.
 - b. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then Technical Data is defined, with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06, as the data contained in boring logs, recorded measurements of subsurface water levels, assessments of the condition of subsurface facilities, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical, environmental, or other Site or facilities conditions report prepared for the Project and made available to Contractor.
 - c. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data, and instead Underground Facilities are shown or indicated on the Drawings.
47. *Underground Facilities*—All active or not-in-service underground lines, pipelines, conduits, ducts, encasements, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems at the Site, including but not limited to those facilities or systems that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude oil products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, or traffic or other control systems. An abandoned facility or system is not an Underground Facility.
48. *Unit Price Work*—Work to be paid for on the basis of unit prices.
49. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.
50. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 Terminology

- A. The words and terms discussed in Paragraphs 1.02.B, C, D, and E are not defined terms that require initial capital letters, but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives:* The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.
- C. *Day:* The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- D. *Defective:* The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - 1. does not conform to the Contract Documents;
 - 2. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - 3. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or Paragraph 15.04).
- E. *Furnish, Install, Perform, Provide*
 - 1. The word “furnish,” when used in connection with services, materials, or equipment, means to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
 - 2. The word “install,” when used in connection with services, materials, or equipment, means to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
 - 3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, means to furnish and install said services, materials, or equipment complete and ready for intended use.
 - 4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

- F. *Contract Price or Contract Times*: References to a change in “Contract Price or Contract Times” or “Contract Times or Contract Price” or similar, indicate that such change applies to (1) Contract Price, (2) Contract Times, or (3) both Contract Price and Contract Times, as warranted, even if the term “or both” is not expressed.
- G. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2—PRELIMINARY MATTERS

2.01 *Delivery of Performance and Payment Bonds; Evidence of Insurance*

- A. *Performance and Payment Bonds*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner the performance bond and payment bond (if the Contract requires Contractor to furnish such bonds).
- B. *Evidence of Contractor’s Insurance*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each additional insured (as identified in the Contract), the certificates, endorsements, and other evidence of insurance required to be provided by Contractor in accordance with Article 6, except to the extent the Supplementary Conditions expressly establish other dates for delivery of specific insurance policies.
- C. *Evidence of Owner’s Insurance*: After receipt of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each additional insured (as identified in the Contract), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

- A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.
- B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

- A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise required by the Contract Documents), Contractor shall submit to Engineer for timely review:
 - 1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;
 - 2. a preliminary Schedule of Submittals; and
 - 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work

into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work, and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other Submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review the schedules submitted in accordance with Paragraph 2.03.A. No progress payment will be made to Contractor until acceptable schedules are submitted to Engineer.
 - 1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
 - 2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
 - 3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.
 - 4. If a schedule is not acceptable, Contractor will have an additional 10 days to revise and resubmit the schedule.

2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may send, and shall accept, Electronic Documents transmitted by Electronic Means.
- B. If the Contract does not establish protocols for Electronic Means, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. Subject to any governing protocols for Electronic Means, when transmitting Electronic Documents by Electronic Means, the transmitting party makes no representations as to long-term compatibility, usability, or readability of the Electronic Documents resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the Electronic Documents.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one Contract Document is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic versions of the Contract Documents (including any printed copies derived from such electronic versions) and the printed record version, the printed record version will govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.
- F. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation will be deemed stricken, and all remaining provisions will continue to be valid and binding upon Owner and Contractor, which agree that the Contract Documents will be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.
- G. Nothing in the Contract Documents creates:
 - 1. any contractual relationship between Owner or Engineer and any Subcontractor, Supplier, or other individual or entity performing or furnishing any of the Work, for the benefit of such Subcontractor, Supplier, or other individual or entity; or
 - 2. any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity, except as may otherwise be required by Laws and Regulations.

3.02 *Reference Standards*

- A. *Standards Specifications, Codes, Laws and Regulations*
 - 1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, means the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
 - 2. No provision of any such standard specification, manual, reference standard, or code, and no instruction of a Supplier, will be effective to change the duties or responsibilities of Owner, Contractor, or Engineer from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner or Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility

inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*

1. *Contractor's Verification of Figures and Field Measurements:* Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.
2. *Contractor's Review of Contract Documents:* If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:
 - a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or
 - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

- A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer in writing all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work.

- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.
- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly notify Owner and Contractor in writing that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

- A. Contractor and its Subcontractors and Suppliers shall not:
 - 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media versions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or
 - 2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein precludes Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the 30th day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the 60th day after the day of Bid opening or the 30th day after the Effective Date of the Contract, whichever date is earlier.

4.02 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work may be done at the Site prior to such date.

4.03 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the

established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.
 - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.
 - 2. Proposed adjustments in the Progress Schedule that will change the Contract Times must be submitted in accordance with the requirements of Article 11.
- B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work will be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

- A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
- C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Such an adjustment will be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
 - 1. Severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
 - 2. Abnormal weather conditions;
 - 3. Acts or failures to act of third-party utility owners or other third-party entities (other than those third-party utility owners or other third-party entities performing other work at or adjacent to the Site as arranged by or under contract with Owner, as contemplated in Article 8); and
 - 4. Acts of war or terrorism.

- D. Contractor's entitlement to an adjustment of Contract Times or Contract Price is limited as follows:
1. Contractor's entitlement to an adjustment of the Contract Times is conditioned on the delay, disruption, or interference adversely affecting an activity on the critical path to completion of the Work, as of the time of the delay, disruption, or interference.
 2. Contractor shall not be entitled to an adjustment in Contract Price for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor. Such a concurrent delay by Contractor shall not preclude an adjustment of Contract Times to which Contractor is otherwise entitled.
 3. Adjustments of Contract Times or Contract Price are subject to the provisions of Article 11.
- E. Each Contractor request or Change Proposal seeking an increase in Contract Times or Contract Price must be supplemented by supporting data that sets forth in detail the following:
1. The circumstances that form the basis for the requested adjustment;
 2. The date upon which each cause of delay, disruption, or interference began to affect the progress of the Work;
 3. The date upon which each cause of delay, disruption, or interference ceased to affect the progress of the Work;
 4. The number of days' increase in Contract Times claimed as a consequence of each such cause of delay, disruption, or interference; and
 5. The impact on Contract Price, in accordance with the provisions of Paragraph 11.07.
- Contractor shall also furnish such additional supporting documentation as Owner or Engineer may require including, where appropriate, a revised progress schedule indicating all the activities affected by the delay, disruption, or interference, and an explanation of the effect of the delay, disruption, or interference on the critical path to completion of the Work.
- F. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5, together with the provisions of Paragraphs 4.05.D and 4.05.E.
- G. Paragraph 8.03 addresses delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

ARTICLE 5—SITE; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor in writing of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.

- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas*

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas, or to improvements, structures, utilities, or similar facilities located at such adjacent lands or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.
 2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.13, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or in a court of competent jurisdiction; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.
- B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris will conform to applicable Laws and Regulations.
 - C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment

and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

- D. *Loading of Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Supplementary Conditions identify:

1. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data;
2. Those drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data; and
3. Technical Data contained in such reports and drawings.

- B. *Underground Facilities:* Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05, and not in the drawings referred to in Paragraph 5.03.A. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

- C. *Reliance by Contractor on Technical Data:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b.

- D. *Limitations of Other Data and Documents:* Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto;
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings;
3. the contents of other Site-related documents made available to Contractor, such as record drawings from other projects at or adjacent to the Site, or Owner's archival documents concerning the Site; or
4. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 *Differing Subsurface or Physical Conditions*

- A. *Notice by Contractor:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site:
1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate;
 2. is of such a nature as to require a change in the Drawings or Specifications;
 3. differs materially from that shown or indicated in the Contract Documents; or
 4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

- B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine whether it is necessary for Owner to obtain additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.
- D. *Early Resumption of Work:* If at any time Engineer determines that Work in connection with the subsurface or physical condition in question may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the condition in question has been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.
- E. *Possible Price and Times Adjustments*
1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in

Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

- a. Such condition must fall within any one or more of the categories described in Paragraph 5.04.A;
 - b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,
 - c. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
- a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise;
 - b. The existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
 - c. Contractor failed to give the written notice required by Paragraph 5.04.A.
3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.
4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.
- F. *Underground Facilities; Hazardous Environmental Conditions*: Paragraph 5.05 governs rights and responsibilities regarding the presence or location of Underground Facilities. Paragraph 5.06 governs rights and responsibilities regarding Hazardous Environmental Conditions. The provisions of Paragraphs 5.03 and 5.04 are not applicable to the presence or location of Underground Facilities, or to Hazardous Environmental Conditions.

5.05 *Underground Facilities*

- A. *Contractor's Responsibilities*: Unless it is otherwise expressly provided in the Supplementary Conditions, the cost of all of the following are included in the Contract Price, and Contractor shall have full responsibility for:
1. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
 2. complying with applicable state and local utility damage prevention Laws and Regulations;

3. verifying the actual location of those Underground Facilities shown or indicated in the Contract Documents as being within the area affected by the Work, by exposing such Underground Facilities during the course of construction;
 4. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
 5. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
- B. *Notice by Contractor:* If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated on the Drawings, or was not shown or indicated on the Drawings with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing regarding such Underground Facility.
- C. *Engineer's Review:* Engineer will:
1. promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy;
 2. identify and communicate with the owner of the Underground Facility; prepare recommendations to Owner (and if necessary issue any preliminary instructions to Contractor) regarding the Contractor's resumption of Work in connection with the Underground Facility in question;
 3. obtain any pertinent cost or schedule information from Contractor; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and
 4. advise Owner in writing of Engineer's findings, conclusions, and recommendations.

During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

- D. *Owner's Statement to Contractor Regarding Underground Facility:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. *Early Resumption of Work:* If at any time Engineer determines that Work in connection with the Underground Facility may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the Underground Facility in question and conditions affected by its presence have been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.
- F. *Possible Price and Times Adjustments*
1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, to the extent that any existing Underground Facility at the Site that was not shown

or indicated on the Drawings, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

- a. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;
 - b. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E; and
 - c. Contractor gave the notice required in Paragraph 5.05.B.
2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.
 3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.
 4. The information and data shown or indicated on the Drawings with respect to existing Underground Facilities at the Site is based on information and data (a) furnished by the owners of such Underground Facilities, or by others, (b) obtained from available records, or (c) gathered in an investigation conducted in accordance with the current edition of ASCE 38, Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data, by the American Society of Civil Engineers. If such information or data is incorrect or incomplete, Contractor's remedies are limited to those set forth in this Paragraph 5.05.F.

5.06 *Hazardous Environmental Conditions at Site*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. those reports known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site;
2. drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
3. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures

- of construction to be employed by Contractor, and safety precautions and programs incident thereto;
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.
- D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.
- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.
- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.
- G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, as a result of such Work stoppage, such special conditions under which Work is agreed to be resumed by Contractor, or any costs or expenses incurred in response to the Hazardous Environmental Condition, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off. Entitlement to any such adjustment is subject to the provisions of Paragraphs 4.05.D, 4.05.E, 11.07, and 11.08.
- H. If, after receipt of such written notice, Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special

conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.

- I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court, arbitration, or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.I obligates Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J obligates Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of Contractor's obligations under the Contract. These bonds must remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the terms of a prescribed bond form, the Supplementary Conditions, or other provisions of the Contract.
- B. Contractor shall also furnish such other bonds (if any) as are required by the Supplementary Conditions or other provisions of the Contract.
- C. All bonds must be in the form included in the Bidding Documents or otherwise specified by Owner prior to execution of the Contract, except as provided otherwise by Laws or

Regulations, and must be issued and signed by a surety named in “Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies” as published in Department Circular 570 (as amended and supplemented) by the Bureau of the Fiscal Service, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual’s authority to bind the surety. The evidence of authority must show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

- D. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue bonds in the required amounts.
- E. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer in writing and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which must comply with the bond and surety requirements above.
- F. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner’s termination rights under Article 16.
- G. Upon request to Owner from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Owner shall provide a copy of the payment bond to such person or entity.
- H. Upon request to Contractor from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Contractor shall provide a copy of the payment bond to such person or entity.

6.02 *Insurance—General Provisions*

- A. Owner and Contractor shall obtain and maintain insurance as required in this article and in the Supplementary Conditions.
- B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized in the state or jurisdiction in which the Project is located to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.
- C. Alternative forms of insurance coverage, including but not limited to self-insurance and “Occupational Accident and Excess Employer’s Indemnity Policies,” are not sufficient to meet the insurance requirements of this Contract, unless expressly allowed in the Supplementary Conditions.
- D. Contractor shall deliver to Owner, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Contractor has obtained and is maintaining the policies and coverages required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, full disclosure of all relevant exclusions, and evidence of insurance required to be purchased and maintained by

Subcontractors or Suppliers. In any documentation furnished under this provision, Contractor, Subcontractors, and Suppliers may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those applicable to this Contract.

- E. Owner shall deliver to Contractor, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Owner has obtained and is maintaining the policies and coverages required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, and full disclosure of all relevant exclusions. In any documentation furnished under this provision, Owner may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those relevant to this Contract.
- F. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, will not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- G. In addition to the liability insurance required to be provided by Contractor, the Owner, at Owner's option, may purchase and maintain Owner's own liability insurance. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.
- H. Contractor shall require:
 - 1. Subcontractors to purchase and maintain worker's compensation, commercial general liability, and other insurance that is appropriate for their participation in the Project, and to name as additional insureds Owner and Engineer (and any other individuals or entities identified in the Supplementary Conditions as additional insureds on Contractor's liability policies) on each Subcontractor's commercial general liability insurance policy; and
 - 2. Suppliers to purchase and maintain insurance that is appropriate for their participation in the Project.
- I. If either party does not purchase or maintain the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.
- J. If Contractor has failed to obtain and maintain required insurance, Contractor's entitlement to enter or remain at the Site will end immediately, and Owner may impose an appropriate set-off against payment for any associated costs (including but not limited to the cost of purchasing necessary insurance coverage), and exercise Owner's termination rights under Article 16.
- K. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect (but is in no way obligated) to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price will be adjusted accordingly.

- L. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests. Contractor is responsible for determining whether such coverage and limits are adequate to protect its interests, and for obtaining and maintaining any additional insurance that Contractor deems necessary.
- M. The insurance and insurance limits required herein will not be deemed as a limitation on Contractor's liability, or that of its Subcontractors or Suppliers, under the indemnities granted to Owner and other individuals and entities in the Contract or otherwise.
- N. All the policies of insurance required to be purchased and maintained under this Contract will contain a provision or endorsement that the coverage afforded will not be canceled, or renewal refused, until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured and Engineer.

6.03 Contractor's Insurance

- A. *Required Insurance:* Contractor shall purchase and maintain Worker's Compensation, Commercial General Liability, and other insurance pursuant to the specific requirements of the Supplementary Conditions.
- B. *General Provisions:* The policies of insurance required by this Paragraph 6.03 as supplemented must:
 - 1. include at least the specific coverages required;
 - 2. be written for not less than the limits provided, or those required by Laws or Regulations, whichever is greater;
 - 3. remain in effect at least until the Work is complete (as set forth in Paragraph 15.06.D), and longer if expressly required elsewhere in this Contract, and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract;
 - 4. apply with respect to the performance of the Work, whether such performance is by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable; and
 - 5. include all necessary endorsements to support the stated requirements.
- C. *Additional Insureds:* The Contractor's commercial general liability, automobile liability, employer's liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies, if required by this Contract, must:
 - 1. include and list as additional insureds Owner and Engineer, and any individuals or entities identified as additional insureds in the Supplementary Conditions;
 - 2. include coverage for the respective officers, directors, members, partners, employees, and consultants of all such additional insureds;
 - 3. afford primary coverage to these additional insureds for all claims covered thereby (including as applicable those arising from both ongoing and completed operations);

4. not seek contribution from insurance maintained by the additional insured; and
5. as to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Contractor's acts or omissions, or the acts and omissions of those working on Contractor's behalf, in the performance of Contractor's operations.

6.04 *Builder's Risk and Other Property Insurance*

- A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the Supplementary Conditions.
- B. *Property Insurance for Facilities of Owner Where Work Will Occur*: Owner is responsible for obtaining and maintaining property insurance covering each existing structure, building, or facility in which any part of the Work will occur, or to which any part of the Work will attach or be adjoined. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, providing coverage consistent with that required for the builder's risk insurance, and will be maintained until the Work is complete, as set forth in Paragraph 15.06.D.
- C. *Property Insurance for Substantially Complete Facilities*: Promptly after Substantial Completion, and before actual occupancy or use of the substantially completed Work, Owner will obtain property insurance for such substantially completed Work, and maintain such property insurance at least until the Work is complete, as set forth in Paragraph 15.06.D. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, and provide coverage consistent with that required for the builder's risk insurance. The builder's risk insurance may terminate upon written confirmation of Owner's procurement of such property insurance.
- D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide advance notice of such occupancy or use to the builder's risk insurer, and obtain an endorsement consenting to the continuation of coverage prior to commencing such partial occupancy or use.
- E. *Insurance of Other Property; Additional Insurance*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, then the entity or individual owning such property item will be responsible for insuring it. If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.04, it may do so at Contractor's expense.

6.05 *Property Losses; Subrogation*

- A. The builder's risk insurance policy purchased and maintained in accordance with Paragraph 6.04 (or an installation floater policy if authorized by the Supplementary Conditions), will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against

Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors.

1. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils, risks, or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all individuals or entities identified in the Supplementary Conditions as builder's risk or installation floater insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused.
 2. None of the above waivers extends to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. Any property insurance policy maintained by Owner covering any loss, damage, or consequential loss to Owner's existing structures, buildings, or facilities in which any part of the Work will occur, or to which any part of the Work will attach or adjoin; to adjacent structures, buildings, or facilities of Owner; or to part or all of the completed or substantially completed Work, during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06, will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them, and that the insured is allowed to waive the insurer's rights of subrogation in a written contract executed prior to the loss, damage, or consequential loss.
1. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from fire or any of the perils, risks, or causes of loss covered by such policies.
- C. The waivers in this Paragraph 6.05 include the waiver of rights due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other insured peril, risk, or cause of loss.
- D. Contractor shall be responsible for assuring that each Subcontract contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from fire or other peril, risk, or cause of loss covered by builder's risk insurance, installation floater, and any other property insurance applicable to the Work.

6.06 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of property insurance required by Paragraph 6.04 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.
- B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.04 shall maintain such proceeds in a segregated account, and distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.
- C. If no other special agreement is reached, Contractor shall repair or replace the damaged Work, using allocated insurance proceeds.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.01 *Contractor's Means and Methods of Construction*

- A. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.
- B. If the Contract Documents note, or Contractor determines, that professional engineering or other design services are needed to carry out Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures, or for Site safety, then Contractor shall cause such services to be provided by a properly licensed design professional, at Contractor's expense. Such services are not Owner-delegated professional design services under this Contract, and neither Owner nor Engineer has any responsibility with respect to (1) Contractor's determination of the need for such services, (2) the qualifications or licensing of the design professionals retained or employed by Contractor, (3) the performance of such services, or (4) any errors, omissions, or defects in such services.

7.02 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who will not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.03 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall maintain good discipline and order at the Site.

- B. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of Contractor's employees; of Suppliers and Subcontractors, and their employees; and of any other individuals or entities performing or furnishing any of the Work, just as Contractor is responsible for Contractor's own acts and omissions.
- C. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site will be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.04 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.
- B. All materials and equipment incorporated into the Work must be new and of good quality, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications will expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment must be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.05 *"Or Equals"*

- A. *Contractor's Request; Governing Criteria:* Whenever an item of equipment or material is specified or described in the Contract Documents by using the names of one or more proprietary items or specific Suppliers, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material, or items from other proposed Suppliers, under the circumstances described below.
 - 1. If Engineer in its sole discretion determines that an item of equipment or material proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer will deem it an "or equal" item. For the purposes of this paragraph, a proposed item of equipment or material will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that the proposed item:
 - 1) is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

- 2) will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
 - 3) has a proven record of performance and availability of responsive service; and
 - 4) is not objectionable to Owner.
- b. Contractor certifies that, if the proposed item is approved and incorporated into the Work:
- 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) the item will conform substantially to the detailed requirements of the item named in the Contract Documents.
- B. *Contractor's Expense*: Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.
- C. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal," which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.
- D. *Effect of Engineer's Determination*: Neither approval nor denial of an "or-equal" request will result in any change in Contract Price. The Engineer's denial of an "or-equal" request will be final and binding, and may not be reversed through an appeal under any provision of the Contract.
- E. *Treatment as a Substitution Request*: If Engineer determines that an item of equipment or material proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the item a proposed substitute pursuant to Paragraph 7.06.

7.06 *Substitutes*

- A. *Contractor's Request; Governing Criteria*: Unless the specification or description of an item of equipment or material required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material under the circumstances described below. To the extent possible such requests must be made before commencement of related construction at the Site.
1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of equipment or material from anyone other than Contractor.
 2. The requirements for review by Engineer will be as set forth in Paragraph 7.06.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.

3. Contractor shall make written application to Engineer for review of a proposed substitute item of equipment or material that Contractor seeks to furnish or use. The application:
 - a. will certify that the proposed substitute item will:
 - 1) perform adequately the functions and achieve the results called for by the general design;
 - 2) be similar in substance to the item specified; and
 - 3) be suited to the same use as the item specified.
 - b. will state:
 - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times;
 - 2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and
 - 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
 - c. will identify:
 - 1) all variations of the proposed substitute item from the item specified; and
 - 2) available engineering, sales, maintenance, repair, and replacement services.
 - d. will contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
- C. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- D. *Reimbursement of Engineer's Cost:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

- E. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
- F. *Effect of Engineer's Determination*: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request will be final and binding, and may not be reversed through an appeal under any provision of the Contract. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.06.D, by timely submittal of a Change Proposal.

7.07 *Concerning Subcontractors and Suppliers*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner. The Contractor's retention of a Subcontractor or Supplier for the performance of parts of the Work will not relieve Contractor's obligation to Owner to perform and complete the Work in accordance with the Contract Documents.
- B. Contractor shall retain specific Subcontractors and Suppliers for the performance of designated parts of the Work if required by the Contract to do so.
- C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor or Supplier to furnish or perform any of the Work against which Contractor has reasonable objection.
- D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within 5 days.
- E. Owner may require the replacement of any Subcontractor or Supplier. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors or Suppliers for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor or Supplier so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor or Supplier.
- F. If Owner requires the replacement of any Subcontractor or Supplier retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. No acceptance by Owner of any such Subcontractor or Supplier, whether initially or as a replacement, will constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.

- H. On a monthly basis, Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors and Suppliers.
- J. The divisions and sections of the Specifications and the identifications of any Drawings do not control Contractor in dividing the Work among Subcontractors or Suppliers, or in delineating the Work to be performed by any specific trade.
- K. All Work performed for Contractor by a Subcontractor or Supplier must be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract for the benefit of Owner and Engineer.
- L. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor for Work performed for Contractor by the Subcontractor or Supplier.
- M. Contractor shall restrict all Subcontractors and Suppliers from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed in this Contract.

7.08 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If an invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights will be disclosed in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.09 *Permits*

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits, licenses, and certificates of occupancy. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

7.10 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

7.11 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It is not Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this does not relieve Contractor of its obligations under Paragraph 3.03.
- C. Owner or Contractor may give written notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such written notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.12 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

7.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations.
- B. Contractor shall designate a qualified and experienced safety representative whose duties and responsibilities are the prevention of Work-related accidents and the maintenance and supervision of safety precautions and programs.
- C. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:
 - 1. all persons on the Site or who may be affected by the Work;
 - 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 - 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- D. All damage, injury, or loss to any property referred to in Paragraph 7.13.C.2 or 7.13.C.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
- E. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection.
- F. Contractor shall notify Owner; the owners of adjacent property; the owners of Underground Facilities and other utilities (if the identity of such owners is known to Contractor); and other contractors and utility owners performing work at or adjacent to the Site, in writing, when Contractor knows that prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.
- G. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. Any Owner's safety programs that are applicable to the Work are identified or included in the Supplementary Conditions or Specifications.
- H. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

- I. Contractor's duties and responsibilities for safety and protection will continue until all the Work is completed, Engineer has issued a written notice to Owner and Contractor in accordance with Paragraph 15.06.C that the Work is acceptable, and Contractor has left the Site (except as otherwise expressly provided in connection with Substantial Completion).
- J. Contractor's duties and responsibilities for safety and protection will resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.14 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of safety data sheets (formerly known as material safety data sheets) or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.15 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused by an emergency, or are required as a result of Contractor's response to an emergency. If Engineer determines that a change in the Contract Documents is required because of an emergency or Contractor's response, a Work Change Directive or Change Order will be issued.

7.16 *Submittals*

A. *Shop Drawing and Sample Requirements*

- 1. Before submitting a Shop Drawing or Sample, Contractor shall:
 - a. review and coordinate the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
 - b. determine and verify:
 - 1) all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect to the Submittal;
 - 2) the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
 - 3) all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto;
 - c. confirm that the Submittal is complete with respect to all related data included in the Submittal.
- 2. Each Shop Drawing or Sample must bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that Submittal, and that Contractor approves the Submittal.

3. With each Shop Drawing or Sample, Contractor shall give Engineer specific written notice of any variations that the Submittal may have from the requirements of the Contract Documents. This notice must be set forth in a written communication separate from the Submittal; and, in addition, in the case of a Shop Drawing by a specific notation made on the Shop Drawing itself.
- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall label and submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals.
1. *Shop Drawings*
 - a. Contractor shall submit the number of copies required in the Specifications.
 - b. Data shown on the Shop Drawings must be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide, and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.C.
 2. *Samples*
 - a. Contractor shall submit the number of Samples required in the Specifications.
 - b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the Submittal for the limited purposes required by Paragraph 7.16.C.
 3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.
- C. *Engineer's Review of Shop Drawings and Samples*
1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the accepted Schedule of Submittals. Engineer's review and approval will be only to determine if the items covered by the Submittals will, after installation or incorporation in the Work, comply with the requirements of the Contract Documents, and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
 2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction, or to safety precautions or programs incident thereto.
 3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
 4. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will

document any such approved variation from the requirements of the Contract Documents in a Field Order or other appropriate Contract modification.

5. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for complying with the requirements of Paragraphs 7.16.A and B.
6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, will not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
7. Neither Engineer's receipt, review, acceptance, or approval of a Shop Drawing or Sample will result in such item becoming a Contract Document.
8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.C.4.

D. Resubmittal Procedures for Shop Drawings and Samples

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous Submittals.
2. Contractor shall furnish required Shop Drawing and Sample submittals with sufficient information and accuracy to obtain required approval of an item with no more than two resubmittals. Engineer will record Engineer's time for reviewing a third or subsequent resubmittal of a Shop Drawing or Sample, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges.
3. If Contractor requests a change of a previously approved Shop Drawing or Sample, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

E. Submittals Other than Shop Drawings, Samples, and Owner-Delegated Designs

1. The following provisions apply to all Submittals other than Shop Drawings, Samples, and Owner-delegated designs:
 - a. Contractor shall submit all such Submittals to the Engineer in accordance with the Schedule of Submittals and pursuant to the applicable terms of the Contract Documents.
 - b. Engineer will provide timely review of all such Submittals in accordance with the Schedule of Submittals and return such Submittals with a notation of either Accepted or Not Accepted. Any such Submittal that is not returned within the time established in the Schedule of Submittals will be deemed accepted.
 - c. Engineer's review will be only to determine if the Submittal is acceptable under the requirements of the Contract Documents as to general form and content of the Submittal.

- d. If any such Submittal is not accepted, Contractor shall confer with Engineer regarding the reason for the non-acceptance, and resubmit an acceptable document.
 2. Procedures for the submittal and acceptance of the Progress Schedule, the Schedule of Submittals, and the Schedule of Values are set forth in Paragraphs 2.03, 2.04, and 2.05.
- F. Owner-delegated Designs: Submittals pursuant to Owner-delegated designs are governed by the provisions of Paragraph 7.19.

7.17 Contractor's General Warranty and Guarantee

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer is entitled to rely on Contractor's warranty and guarantee.
- B. Owner's rights under this warranty and guarantee are in addition to, and are not limited by, Owner's rights under the correction period provisions of Paragraph 15.08. The time in which Owner may enforce its warranty and guarantee rights under this Paragraph 7.17 is limited only by applicable Laws and Regulations restricting actions to enforce such rights; provided, however, that after the end of the correction period under Paragraph 15.08:
1. Owner shall give Contractor written notice of any defective Work within 60 days of the discovery that such Work is defective; and
 2. Such notice will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the notice.
- C. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
1. abuse, or improper modification, maintenance, or operation, by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 2. normal wear and tear under normal usage.
- D. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents, a release of Contractor's obligation to perform the Work in accordance with the Contract Documents, or a release of Owner's warranty and guarantee rights under this Paragraph 7.17:
1. Observations by Engineer;
 2. Recommendation by Engineer or payment by Owner of any progress or final payment;
 3. The issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
 4. Use or occupancy of the Work or any part thereof by Owner;
 5. Any review and approval of a Shop Drawing or Sample submittal;
 6. The issuance of a notice of acceptability by Engineer;
 7. The end of the correction period established in Paragraph 15.08;
 8. Any inspection, test, or approval by others; or

9. Any correction of defective Work by Owner.
- E. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract will govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from losses, damages, costs, and judgments (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising from third-party claims or actions relating to or resulting from the performance or furnishing of the Work, provided that any such claim, action, loss, cost, judgment or damage is attributable to bodily injury, sickness, disease, or death, or to damage to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom, but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A will not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

7.19 *Delegation of Professional Design Services*

- A. Owner may require Contractor to provide professional design services for a portion of the Work by express delegation in the Contract Documents. Such delegation will specify the performance and design criteria that such services must satisfy, and the Submittals that Contractor must furnish to Engineer with respect to the Owner-delegated design.
- B. Contractor shall cause such Owner-delegated professional design services to be provided pursuant to the professional standard of care by a properly licensed design professional, whose signature and seal must appear on all drawings, calculations, specifications, certifications, and Submittals prepared by such design professional. Such design professional must issue all certifications of design required by Laws and Regulations.
- C. If a Shop Drawing or other Submittal related to the Owner-delegated design is prepared by Contractor, a Subcontractor, or others for submittal to Engineer, then such Shop Drawing or other Submittal must bear the written approval of Contractor's design professional when submitted by Contractor to Engineer.

- D. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, and approvals performed or provided by the design professionals retained or employed by Contractor under an Owner-delegated design, subject to the professional standard of care and the performance and design criteria stated in the Contract Documents.
- E. Pursuant to this Paragraph 7.19, Engineer's review, approval, and other determinations regarding design drawings, calculations, specifications, certifications, and other Submittals furnished by Contractor pursuant to an Owner-delegated design will be only for the following limited purposes:
 - 1. Checking for conformance with the requirements of this Paragraph 7.19;
 - 2. Confirming that Contractor (through its design professionals) has used the performance and design criteria specified in the Contract Documents; and
 - 3. Establishing that the design furnished by Contractor is consistent with the design concept expressed in the Contract Documents.
- F. Contractor shall not be responsible for the adequacy of performance or design criteria specified by Owner or Engineer.
- G. Contractor is not required to provide professional services in violation of applicable Laws and Regulations.

ARTICLE 8—OTHER WORK AT THE SITE

8.01 *Other Work*

- A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.
- B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any third-party utility work that Owner has arranged to take place at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford proper and safe access to the Site to each contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work.
- D. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.

- E. If the proper execution or results of any part of Contractor's Work depends upon work performed by others, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.
- F. The provisions of this article are not applicable to work that is performed by third-party utilities or other third-party entities without a contract with Owner, or that is performed without having been arranged by Owner. If such work occurs, then any related delay, disruption, or interference incurred by Contractor is governed by the provisions of Paragraph 4.05.C.3.

8.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:
 - 1. The identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
 - 2. An itemization of the specific matters to be covered by such authority and responsibility; and
 - 3. The extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

- A. If, in the course of performing other work for Owner at or adjacent to the Site, the Owner's employees, any other contractor working for Owner, or any utility owner that Owner has arranged to perform work, causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment will take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract, and any remedies available to Contractor under Laws or Regulations concerning utility action or inaction. When applicable, any such equitable adjustment in Contract Price will be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times or Contract Price is subject to the provisions of Paragraphs 4.05.D and 4.05.E.

- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site.
 - 1. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this Paragraph 8.03.B.
 - 2. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due Contractor.
- C. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9—OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

9.02 *Replacement of Engineer*

- A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents will be that of the former Engineer.

9.03 *Furnish Data*

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

9.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

- 9.05 *Lands and Easements; Reports, Tests, and Drawings*
- A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.
 - B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
 - C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.
- 9.06 *Insurance*
- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.
- 9.07 *Change Orders*
- A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.
- 9.08 *Inspections, Tests, and Approvals*
- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.
- 9.09 *Limitations on Owner's Responsibilities*
- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- 9.10 *Undisclosed Hazardous Environmental Condition*
- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.
- 9.11 *Evidence of Financial Arrangements*
- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract (including obligations under proposed changes in the Work).
- 9.12 *Safety Programs*
- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.
 - B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *Owner's Representative*

- A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe, as an experienced and qualified design professional, the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.07. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Resident Project Representative*

- A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in the Supplementary Conditions and in Paragraph 10.07.
- B. If Owner designates an individual or entity who is not Engineer's consultant, agent, or employee to represent Owner at the Site, then the responsibilities and authority of such individual or entity will be as provided in the Supplementary Conditions.

10.04 *Engineer's Authority*

- A. Engineer has the authority to reject Work in accordance with Article 14.
- B. Engineer's authority as to Submittals is set forth in Paragraph 7.16.
- C. Engineer's authority as to design drawings, calculations, specifications, certifications and other Submittals from Contractor in response to Owner's delegation (if any) to Contractor of professional design services, is set forth in Paragraph 7.19.
- D. Engineer's authority as to changes in the Work is set forth in Article 11.

E. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.05 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.06 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.07 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, will create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation, and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Contractor under Paragraph 15.06.A, will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 10.07 also apply to the Resident Project Representative, if any.

10.08 *Compliance with Safety Program*

A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs of which Engineer has been informed.

ARTICLE 11—CHANGES TO THE CONTRACT

11.01 *Amending and Supplementing the Contract*

- A. The Contract may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
- B. If an amendment or supplement to the Contract includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order.
- C. All changes to the Contract that involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, must be supported by Engineer's recommendation. Owner and Contractor may amend other terms and conditions of the Contract without the recommendation of the Engineer.

11.02 *Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders covering:
 - 1. Changes in Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
 - 2. Changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
 - 3. Changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.05, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters; and
 - 4. Changes that embody the substance of any final and binding results under: Paragraph 11.03.B, resolving the impact of a Work Change Directive; Paragraph 11.09, concerning Change Proposals; Article 12, Claims; Paragraph 13.02.D, final adjustments resulting from allowances; Paragraph 13.03.D, final adjustments relating to determination of quantities for Unit Price Work; and similar provisions.
- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of Paragraph 11.02.A, it will be deemed to be of full force and effect, as if fully executed.

11.03 *Work Change Directives*

- A. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.07 regarding change of Contract Price.

- B. If Owner has issued a Work Change Directive and:
 - 1. Contractor believes that an adjustment in Contract Times or Contract Price is necessary, then Contractor shall submit any Change Proposal seeking such an adjustment no later than 30 days after the completion of the Work set out in the Work Change Directive.
 - 2. Owner believes that an adjustment in Contract Times or Contract Price is necessary, then Owner shall submit any Claim seeking such an adjustment no later than 60 days after issuance of the Work Change Directive.

11.04 *Field Orders*

- A. Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly.
- B. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.05 *Owner-Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Changes involving the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters will be supported by Engineer's recommendation.
- B. Such changes in the Work may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work must be performed under the applicable conditions of the Contract Documents.
- C. Nothing in this Paragraph 11.05 obligates Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.06 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.C.2.

11.07 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment of Contract Price must comply with the provisions of Article 12.
- B. An adjustment in the Contract Price will be determined as follows:

1. Where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03);
 2. Where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.07.C.2); or
 3. Where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.07.C).
- C. *Contractor's Fee:* When applicable, the Contractor's fee for overhead and profit will be determined as follows:
1. A mutually acceptable fixed fee; or
 2. If a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. For costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee will be 15 percent;
 - b. For costs incurred under Paragraph 13.01.B.3, the Contractor's fee will be 5 percent;
 - c. Where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.07.C.2.a and 11.07.C.2.b is that the Contractor's fee will be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of 5 percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted Work the maximum total fee to be paid by Owner will be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the Work;
 - d. No fee will be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
 - e. The amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in Cost of the Work will be the amount of the actual net decrease in Cost of the Work and a deduction of an additional amount equal to 5 percent of such actual net decrease in Cost of the Work; and
 - f. When both additions and credits are involved in any one change or Change Proposal, the adjustment in Contractor's fee will be computed by determining the sum of the costs in each of the cost categories in Paragraph 13.01.B (specifically, payroll costs, Paragraph 13.01.B.1; incorporated materials and equipment costs, Paragraph 13.01.B.2; Subcontract costs, Paragraph 13.01.B.3; special consultants costs, Paragraph 13.01.B.4; and other costs, Paragraph 13.01.B.5) and applying to each such cost category sum the appropriate fee from Paragraphs 11.07.C.2.a through 11.07.C.2.e, inclusive.

11.08 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment in the Contract Times must comply with the provisions of Article 12.
- B. Delay, disruption, and interference in the Work, and any related changes in Contract Times, are addressed in and governed by Paragraph 4.05.

11.09 *Change Proposals*

A. *Purpose and Content:* Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; contest an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; challenge a set-off against payment due; or seek other relief under the Contract. The Change Proposal will specify any proposed change in Contract Times or Contract Price, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents. Each Change Proposal will address only one issue, or a set of closely related issues.

B. *Change Proposal Procedures*

1. *Submittal:* Contractor shall submit each Change Proposal to Engineer within 30 days after the start of the event giving rise thereto, or after such initial decision.
2. *Supporting Data:* The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal.
 - a. Change Proposals based on or related to delay, interruption, or interference must comply with the provisions of Paragraphs 4.05.D and 4.05.E.
 - b. Change proposals related to a change of Contract Price must include full and detailed accounts of materials incorporated into the Work and labor and equipment used for the subject Work.

The supporting data must be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event.

3. *Engineer's Initial Review:* Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal. If in its discretion Engineer concludes that additional supporting data is needed before conducting a full review and making a decision regarding the Change Proposal, then Engineer may request that Contractor submit such additional supporting data by a date specified by Engineer, prior to Engineer beginning its full review of the Change Proposal.
4. *Engineer's Full Review and Action on the Change Proposal:* Upon receipt of Contractor's supporting data (including any additional data requested by Engineer), Engineer will conduct a full review of each Change Proposal and, within 30 days after such receipt of the Contractor's supporting data, either approve the Change Proposal in whole, deny it in whole, or approve it in part and deny it in part. Such actions must be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change

Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

5. *Binding Decision*: Engineer's decision is final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- C. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties in writing that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice will be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.
- D. *Post-Completion*: Contractor shall not submit any Change Proposals after Engineer issues a written recommendation of final payment pursuant to Paragraph 15.06.B.

11.10 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 12—CLAIMS

12.01 *Claims*

- A. *Claims Process*: The following disputes between Owner and Contractor are subject to the Claims process set forth in this article:
 1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;
 2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents;
 3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters; and
 4. Subject to the waiver provisions of Paragraph 15.07, any dispute arising after Engineer has issued a written recommendation of final payment pursuant to Paragraph 15.06.B.
- B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim rests with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge

and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

- C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim will be stated in writing and submitted to the other party, with a copy to Engineer.
- D. *Mediation*
 - 1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate will stay the Claim submittal and response process.
 - 2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process will resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process will resume as of the date of the conclusion of the mediation, as determined by the mediator.
 - 3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.
- E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action will be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
- F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim will be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.
- G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim will be incorporated in a Change Order or other written document to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13—COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 *Cost of the Work*

- A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
 - 1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or

2. When needed to determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included:* Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work will be in amounts no higher than those commonly incurred in the locality of the Project, will not include any of the costs itemized in Paragraph 13.01.C, and will include only the following items:
1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor in advance of the subject Work. Such employees include, without limitation, superintendents, foremen, safety managers, safety representatives, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work will be apportioned on the basis of their time spent on the Work. Payroll costs include, but are not limited to, salaries and wages plus the cost of fringe benefits, which include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, will be included in the above to the extent authorized by Owner.
 2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts will accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment will accrue to Owner, and Contractor shall make provisions so that they may be obtained.
 3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, which will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee will be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.
 4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed or retained for services specifically related to the Work.
 5. Other costs consisting of the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, which are

consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

- 1) In establishing included costs for materials such as scaffolding, plating, or sheeting, consideration will be given to the actual or the estimated life of the material for use on other projects; or rental rates may be established on the basis of purchase or salvage value of such items, whichever is less. Contractor will not be eligible for compensation for such items in an amount that exceeds the purchase cost of such item.

c. *Construction Equipment Rental*

- 1) Rentals of all construction equipment and machinery, and the parts thereof, in accordance with rental agreements approved by Owner as to price (including any surcharge or special rates applicable to overtime use of the construction equipment or machinery), and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs will be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts must cease when the use thereof is no longer necessary for the Work.
- 2) Costs for equipment and machinery owned by Contractor or a Contractor-related entity will be paid at a rate shown for such equipment in the equipment rental rate book specified in the Supplementary Conditions. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs.
- 3) With respect to Work that is the result of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price ("changed Work"), included costs will be based on the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, must cease to accrue when the use thereof is no longer necessary for the changed Work.

- d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
- e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
- f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of builder's risk or other property insurance established in accordance with Paragraph 6.04), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses will be included in the Cost of the Work for the purpose of determining Contractor's fee.

- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

C. *Costs Excluded*: The term Cost of the Work does not include any of the following items:

- 1. Payroll costs and other compensation of Contractor's officers, executives, principals, general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
- 2. The cost of purchasing, renting, or furnishing small tools and hand tools.
- 3. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
- 4. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
- 5. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
- 6. Expenses incurred in preparing and advancing Claims.
- 7. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee*

- 1. When the Work as a whole is performed on the basis of cost-plus-a-fee, then:
 - a. Contractor's fee for the Work set forth in the Contract Documents as of the Effective Date of the Contract will be determined as set forth in the Agreement.
 - b. for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work, Contractor's fee will be determined as follows:
 - 1) When the fee for the Work as a whole is a percentage of the Cost of the Work, the fee will automatically adjust as the Cost of the Work changes.
 - 2) When the fee for the Work as a whole is a fixed fee, the fee for any additions or deletions will be determined in accordance with Paragraph 11.07.C.2.
- 2. When the Work as a whole is performed on the basis of a stipulated sum, or any other basis other than cost-plus-a-fee, then Contractor's fee for any Work covered by a Change

Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work will be determined in accordance with Paragraph 11.07.C.2.

- E. *Documentation and Audit:* Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor and pertinent Subcontractors will establish and maintain records of the costs in accordance with generally accepted accounting practices. Subject to prior written notice, Owner will be afforded reasonable access, during normal business hours, to all Contractor's accounts, records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda, and similar data relating to the Cost of the Work and Contractor's fee. Contractor shall preserve all such documents for a period of three years after the final payment by Owner. Pertinent Subcontractors will afford such access to Owner, and preserve such documents, to the same extent required of Contractor.

13.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
- B. *Cash Allowances:* Contractor agrees that:
1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
 2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment for any of the foregoing will be valid.
- C. *Owner's Contingency Allowance:* Contractor agrees that an Owner's contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor for Work covered by allowances, and the Contract Price will be correspondingly adjusted.

13.03 Unit Price Work

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision

thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, and the final adjustment of Contract Price will be set forth in a Change Order, subject to the provisions of the following paragraph.

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:
 - a. the quantity of the item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
 - b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.
2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.
3. Adjusted unit prices will apply to all units of that item.

ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply with such procedures and programs as applicable.

14.02 *Tests, Inspections, and Approvals*

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work will be governed by the provisions of Paragraph 14.05.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

- D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:
1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
 2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
 3. by manufacturers of equipment furnished under the Contract Documents;
 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
 5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests will be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering will be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

- A. *Contractor's Obligation:* It is Contractor's obligation to assure that the Work is not defective.
- B. *Engineer's Authority:* Engineer has the authority to determine whether Work is defective, and to reject defective Work.
- C. *Notice of Defects:* Prompt written notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
- D. *Correction, or Removal and Replacement:* Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties:* When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.
- F. *Costs and Damages:* In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs,

losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work will be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

- A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.
- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.
- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.
 - 1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
 - 2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work,

or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work will not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

14.07 Owner May Correct Defective Work

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace defective Work as required by Engineer, then Owner may, after 7 days' written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.
- C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.
- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

ARTICLE 15—PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 Progress Payments

- A. *Basis for Progress Payments:* The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments for Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.
- B. *Applications for Payments*
 - 1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents.
 - 2. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment must also be accompanied by: (a) a bill of sale, invoice, copies of subcontract or purchase order payments, or other documentation

establishing full payment by Contractor for the materials and equipment; (b) at Owner's request, documentation warranting that Owner has received the materials and equipment free and clear of all Liens; and (c) evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

3. Beginning with the second Application for Payment, each Application must include an affidavit of Contractor stating that all previous progress payments received by Contractor have been applied to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
4. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

C. *Review of Applications*

1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
 - a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
 - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or
 - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
 - a. to supervise, direct, or control the Work;
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto;
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work;
 - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid by Owner; or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.
6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
 - a. the Work is defective, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or
 - e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due*

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner*

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
 - a. Claims have been made against Owner based on Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages resulting from Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;

- b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
 - c. Contractor has failed to provide and maintain required bonds or insurance;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
 - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
 - f. The Work is defective, requiring correction or replacement;
 - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - h. The Contract Price has been reduced by Change Orders;
 - i. An event has occurred that would constitute a default by Contractor and therefore justify a termination for cause;
 - j. Liquidated or other damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
 - k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens; or
 - l. Other items entitle Owner to a set-off against the amount recommended.
2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed will be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.
 3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld will be treated as an amount due as determined by Paragraph 15.01.D.1 and subject to interest as provided in the Agreement.

15.02 Contractor's Warranty of Title

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than 7 days after the time of payment by Owner.

15.03 Substantial Completion

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time

submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which will fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have 7 days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.
- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.
- F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without

significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. At any time, Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through 15.03.E for that part of the Work.
2. At any time, Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.04 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *Final Payment*

A. *Application for Payment*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.12), and other documents, Contractor may make application for final payment.
2. The final Application for Payment must be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents;
 - b. consent of the surety, if any, to final payment;
 - c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.

- d. a list of all duly pending Change Proposals and Claims; and
 - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.
- B. *Engineer's Review of Final Application and Recommendation of Payment:* If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within 10 days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the final Application for Payment to Owner for payment. Such recommendation will account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.
- C. *Notice of Acceptability:* In support of its recommendation of payment of the final Application for Payment, Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to stated limitations in the notice and to the provisions of Paragraph 15.07.
- D. *Completion of Work:* The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment and issuance of notice of the acceptability of the Work.
- E. *Final Payment Becomes Due:* Upon receipt from Engineer of the final Application for Payment and accompanying documentation, Owner shall set off against the amount recommended by Engineer for final payment any further sum to which Owner is entitled, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions of this Contract with respect to progress payments. Owner shall pay the resulting balance due to Contractor within 30 days of Owner's receipt of the final Application for Payment from Engineer.

15.07 *Waiver of Claims*

- A. By making final payment, Owner waives its claim or right to liquidated damages or other damages for late completion by Contractor, except as set forth in an outstanding Claim,

appeal under the provisions of Article 17, set-off, or express reservation of rights by Owner. Owner reserves all other claims or rights after final payment.

- B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted as a Claim, or appealed under the provisions of Article 17.

15.08 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the Supplementary Conditions or the terms of any applicable special guarantee required by the Contract Documents), Owner gives Contractor written notice that any Work has been found to be defective, or that Contractor's repair of any damages to the Site or adjacent areas has been found to be defective, then after receipt of such notice of defect Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
 - 1. correct the defective repairs to the Site or such adjacent areas;
 - 2. correct such defective Work;
 - 3. remove the defective Work from the Project and replace it with Work that is not defective, if the defective Work has been rejected by Owner, and
 - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting from the corrective measures.
- B. Owner shall give any such notice of defect within 60 days of the discovery that such Work or repairs is defective. If such notice is given within such 60 days but after the end of the correction period, the notice will be deemed a notice of defective Work under Paragraph 7.17.B.
- C. If, after receipt of a notice of defect within 60 days and within the correction period, Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others). Contractor's failure to pay such costs, losses, and damages within 10 days of invoice from Owner will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the failure to pay.
- D. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- E. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

- F. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph are not to be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times directly attributable to any such suspension. Any Change Proposal seeking such adjustments must be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:
 - 1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment, or failure to adhere to the Progress Schedule);
 - 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
 - 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
 - 4. Contractor's repeated disregard of the authority of Owner or Engineer.
- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) 10 days' written notice that Owner is considering a declaration that Contractor is in default and termination of the Contract, Owner may proceed to:
 - 1. declare Contractor to be in default, and give Contractor (and any surety) written notice that the Contract is terminated; and
 - 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within 7 days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects,

attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

- F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond will govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate for Convenience*

- A. Upon 7 days' written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
 - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and
 - 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
- B. Contractor shall not be paid for any loss of anticipated profits or revenue, post-termination overhead costs, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon 7 days' written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, 7 days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The

provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17—FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this article:
1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full, pursuant to Article 12; and
 2. Disputes between Owner and Contractor concerning the Work, or obligations under the Contract Documents, that arise after final payment has been made.
- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this article, Owner or Contractor may:
1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions;
 2. agree with the other party to submit the dispute to another dispute resolution process; or
 3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18—MISCELLANEOUS

18.01 *Giving Notice*

- A. Whenever any provision of the Contract requires the giving of written notice to Owner, Engineer, or Contractor, it will be deemed to have been validly given only if delivered:
1. in person, by a commercial courier service or otherwise, to the recipient's place of business;
 2. by registered or certified mail, postage prepaid, to the recipient's place of business; or
 3. by e-mail to the recipient, with the words "Formal Notice" or similar in the e-mail's subject line.

18.02 *Computation of Times*

- A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

18.03 *Cumulative Remedies*

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

- A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

- A. A party's non-enforcement of any provision will not constitute a waiver of that provision, nor will it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination of the Contract or of the services of Contractor.

18.07 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Assignment of Contract*

- A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party to this Contract of any rights under or interests in the Contract will be binding on the other party without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract.

18.09 *Successors and Assigns*

- A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

18.10 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

SECTION 00800
SUPPLEMENTARY GENERAL CONDITIONS

SECTION 00800
SUPPLEMENTARY CONDITIONS
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INTRODUCTORY STATEMENT

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract (EJCDC C-700, 2018 Edition). All provisions which are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added—for example, “Paragraph SC-4.05.”

ARTICLE 1 - DEFINITIONS AND TERMINOLOGY

SC-1.01.A.4 Add the following sentence to Paragraph 1.01.A.4:

The term “Offer” has the same meaning as the term “Bid”.

SC-1.01.A.5 Add the following sentence to Paragraph 1.01.A.5

The term “Offeror” has the same meaning as the term “Bidder”.

SC-1.01.A.10.e Add the following sentence to Paragraph 1.01.A.10.e

When submitted, a Claim must be signed by the Designated Authorized Representative.

SC-1.01.A.51 Add the following paragraph as reference 1.01.A.51:

Designated Authorized Representative — the representative authorized by the party filing the Claim to execute legally-binding agreements on behalf of that party. For Owner, the Designated Authorized Representative shall be the Chief Technical Officer, a Vice President, or President and Chief Executive Officer. For Contractor, the owner or its designee authorized pursuant to a power of attorney.

SC-1.01.A.52 Add the following paragraph as reference 1.01.A.52:

Health and Safety Plan — The part of the Contract Documents prepared by Contractor that describes safety procedures for the Work, identifies the Contractor’s safety representative required by Paragraph 6.14.A, and certifies that the Contractor’s employees have received or will receive training prior to the commencement of the Work on (1) basic health and safety issues; (2) the Health and Safety Plan; (3) the methods and techniques the Contractor will use on the Project; (4) procedures for Contractor entrance into and exit from the Site(s); and (5) informing Owner about any unique hazards presented by the Work or found as a result of the Work.

ARTICLE 2 - PRELIMINARY MATTERS

2.02 *Copies of Documents*

SC-2.02 Delete Paragraph 2.02.A in its entirety and insert the following in its place:

- A. Owner shall provide to Contractor an electronic version of a fully executed copy of the contract documents.

2.03 *Before Starting Construction*

SC-2.03.B Add the following new paragraph immediately after Paragraph 2.03.A.3

- B. *Health and Safety Plan.* Contractor shall submit a copy of Health and Safety Plan fifteen (15) days before mobilization. No Work shall proceed until the Owner has accepted the Health and Safety Plan.

2.04 *Pre-Construction Conference; Designation of Authorized Representatives*

SC-2.04.B Amend the first sentence of Paragraph 2.04.B to read as follows:

At or prior to this conference Owner and Contractor each shall designate, in writing by Owner and in writing by Contractor as a submittal, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract.

2.05 *Acceptance of Schedules*

SC-2.05.A Amend the first sentence of Paragraph 2.05.A to read as follows:

At the preconstruction conference indicated in Paragraph 2.04 or other time acceptable to the parties and Engineer, Engineer and Contractor will review the acceptability to Engineer, as provided below, of the schedules submitted in accordance with Paragraph 2.03.A.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

SC-3.01.C Delete Paragraph 3.01.C in its entirety.

SC-3.03.B.1 Add the following to new paragraph immediately after Paragraph 3.03.B:

SC-3.03.B.1 In resolving such conflicts, errors, and discrepancies, the Contract Documents will be given precedence in the following order: Change Orders, Field Orders, Addenda, Agreement, Performance Bond and Payment Bond, Supplementary Conditions, General Conditions, Specifications and Drawings. Numerical dimensions shown on the Drawings shall govern over scaled dimensions on the Drawings. This Paragraph SC-3.03.B.1 is not, however, a definitive enumeration of what comprises the "Contract Documents", which definitive enumeration is indicated in the Agreement.

ARTICLE 4 - COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

SC-4.01.A Amend the third sentence of paragraph 4.01.A by changing the word “60th” to read as “90th”.

4.03 *Reference Points*

SC-4.03.A Amend the third sentence of Paragraph 4.03.A to read as follows:

Contractor shall report to Engineer when a reference point, including property boundary stakes or monuments, or an elevation benchmark, is disturbed, lost, or destroyed, or requires relocation because of necessary changes in grades or locations. Contractor shall be responsible for accurately replacing or relocating such reference points by a professional land surveyor licensed by and registered in the State of Texas.

4.05 *Delays in Contractor’s Progress*

SC-4.05.C Amend Paragraph 4.05.C by adding the following subparagraphs:

5. Weather-Related Delays

- a. If “abnormal weather conditions” as set forth in Paragraph 4.05.C.2 of the General Conditions are the basis for a request for an equitable adjustment in the Contract Time, such request must be documented by data substantiating each of the following: 1) that weather conditions were abnormal for the period of time in which the delay occurred, 2) that such weather conditions could not have been reasonably anticipated, and 3) that such weather conditions had an adverse effect on the Work as scheduled.
- b. The existence of abnormal weather conditions will be determined on a month-by-month basis in accordance with the following:
 - 1) Every workday on which one or more of the following conditions exist will be considered a “bad weather day”:
 - i) Total precipitation (as rain equivalent) occurring between 7:00 p.m. on the preceding day (regardless of whether such preceding day is a workday) through 7:00 p.m. on the workday in question equals or exceeds 1-inch over a 24-hour period of precipitation (as rain equivalent, based on the snow/rain conversion indicated in the table entitled Foreseeable Bad Weather Days; such table is hereby incorporated in this SC-4.05.C by reference).
 - ii) Ambient outdoor air temperature at 11:00 a.m. is equal to or less than the following low temperature threshold: wind chill factor equal or less than 25-degrees Fahrenheit; or, at 3:00 p.m. the ambient outdoor temperature is equal to or greater than the following high temperature threshold: equal or greater than 110-degrees Fahrenheit.

- iii) Suspension (greater than 4 hours) or postponement of construction due to high wind advisory/warning that has been issued and does not allow construction activities to continue.
- 2) Determination of actual bad weather days during performance of the Work will be based on the weather records measured and recorded by the El Paso International Airport weather monitoring station located at 6701 Convair Road in El Paso, Texas.
- 3) Contractor shall anticipate the number of foreseeable bad weather days per month indicated in the Foreseeable Bad Weather Days table, Exhibit A included in SC-4.05.5.b.4.
- 4) Foreseeable Bad Weather Days:
 - i) Foreseeable Bad Weather Days (Standard Baseline) is defined as the normal number of calendar days for each month during which construction activity exposed to weather conditions is expected to be prevented and suspended by cause of adverse weather. Suspension of construction activity for the number of days each month as listed in the Standard Baseline is included in the Work and is not eligible for extension of Contract Time.
 - ii) The Foreseeable Bad Weather Days are as follows:

Exhibit A

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4	3	3	2	3	4	8	8	6	5	3	4

- 5) In each month, every bad weather day exceeding the number of foreseeable bad weather days established in the Standard Baseline table in Exhibit A - Foreseeable Bad Weather Days will be considered as “abnormal weather conditions.” The existence of abnormal weather conditions will not relieve Contractor of the obligation to demonstrate and document that delays caused by abnormal weather are specific to the planned work activities or that such activities thus delayed were on Contractor’s then-current Progress Schedule’s critical path for the Project.

ARTICLE 5 - SITE, SUBSURFACE AND PHYSICAL CONDITIONS, HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 Availability of Lands

SC 5.01.D Add the following new paragraph immediately after paragraph 5.01.C:

SC-5.01.D All work associated with special provisions of easements shall be performed in accordance with the Contract Documents, unless the Contract Documents indicate that easement provisions govern. Should the actions of Contractor or Subcontractors or Suppliers cause

the Work to be delayed to the point that the ending date of an easement is exceeded, Contractor shall reimburse Owner for additional costs required to extend the period of rights to the easement to complete the Work. Such delay shall be considered to be within the control of Contractor, in accordance with paragraph 4.05.

5.02 *Use of Site and Other Areas*

SC-5.02.E Add the following new paragraph immediately after Paragraph 5.02.D:

SC-5.02.E *Dust Control*

1. Contractor shall not cause or allow dust-generating operations, earthmoving operation, use of property, or other operation that results in fugitive dust emissions that exceed the limits prescribed by the authority having jurisdiction, in accordance with Texas Administrative Code Title 30, Part 1, Chapter 111, Subchapter A, Division 4, Rule 111.145. Contact City of El Paso Environmental Management Division at (915) 212-6000 for additional information regarding nuisance fugitive dust emissions from the Site.
2. Provide necessary equipment and materials to apply sufficient dust suppressants, properly clean all vehicle “track-out” areas on and adjacent to the Site and provide adequate physical stabilizations of soils to comply with requirements of earthmoving permits and approved dust control plan or activities, if any.
3. Contractor shall pay fines and civil penalties imposed by authorities having jurisdiction and incurred by Owner because of Contractor’s violation of earthmoving permits and dust control plans or activities.
4. Implement measures to control fugitive dust emissions from the Site in compliance with earthmoving permit and Laws and Regulations.

5.03 *Subsurface and Physical Conditions*

SC-5.03 Add the following new paragraphs immediately after Paragraph 5.03.D:

- E. The following table lists the reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data and specifically identifies the Technical Data in the report upon which Contractor may rely:

Report Title	Date of Report	Technical Data
“Geotechnical Study Ridge View/High Ridge Channel – Sedimentation Basin”	12/18/2018	Geotechnical Condition of Arroyo 1

- F. The following table lists the drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data, and specifically identifies the Technical Data upon which Contractor may rely:

Drawings Title	Date of Drawings	Technical Data
Arroyo 1 Dam Detention Improvements	July 2023	Plans for construction of improvements

- G. Contractor may examine copies of reports and drawings identified in SC-5.03.E and SC-5.03.F that were not included with the Bidding Documents at the El Paso Water Utilities' website:

www.epwater.org/business_center/purchasing_overview/bids

5.06 *Hazardous Environmental Conditions at Site*

SC-5.06 Add the following new paragraphs immediately after Paragraph 5.06.A.3:

4. The following table lists the reports known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and the Technical Data (if any) upon which Contractor may rely:

Report Title	Date of Report	Technical Data
No such reports exist	None	None

5. The following table lists the drawings known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and Technical Data (if any) contained in such Drawings upon which Contractor may rely:

Drawings Title	Date of Drawings	Technical Data
No such drawings exist	None	None

ARTICLE 6 - BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

SC-6.01.A Delete Paragraph 6.01.A and 6.01.B in their entirety and insert the following in place of:

- SC-6.01.A Except as provided in this Paragraph SC-6.01.A, Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds and certificates of insurance as are required by the Contract Documents. Certificates of insurance shall be in the form

prescribed by the Contract Documents. Conditions under which a payment bond and/or performance bond are required are as follows:

1. Payment bond is required when the contract award is in excess of \$50,000, and;
2. Performance Bond is required when the contract award is in excess of \$100,000.

(Note: Contract value is excess of \$100,000, both bonds are required.)

SC-6.01.B Delete Paragraph 6.01.C in its entirety and insert the following in its place:

SC-6.01.B. All bonds shall be in the form prescribed by the Contract Documents, except as provided otherwise by Laws and Regulations including, but not limited to, Chapter 2253 of the Texas Government Code and Article 7.19-1 of the Texas Insurance Code. The bonds shall be executed by surety which shall be authorized and admitted to do business in the State of Texas, licensed by the State of Texas to issue surety bonds, and carry an A.M. Best Key rating of not less than A VIII. If the amount of the bond is in excess of ten percent of surety's capital and surplus, surety shall furnish to Owner a written certification that surety has insured that portion of surety's risk that exceeds ten percent of surety's capital and surplus with one or more reinsurers who are duly authorized, accredited or trusted to do business in the State of Texas. If any portion of surety's obligation is reinsured, the amount reinsured shall not exceed ten percent of the reinsurer's capital and surplus. Surety and the reinsurer(s) shall furnish additional information and documentation, if any, required by Owner for Owner to determine whether surety or its reinsurer(s) comply with the requirements of this Paragraph SC-6.01.B. All bonds signed by an agent or attorney-in-fact shall be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.

6.02 *Insurance - General Provisions*

SC-6.02.G Delete Paragraph 6.02.G in its entirety and insert the following in its place:

SC-6.02.G Not Used.

6.03 *Contractor's Insurance*

SC-6.03.C Add the following immediately after Paragraph 6.03.C.1:

a. In addition to the individuals or entities specified above, include as additional insured, or loss payees as their interest may appear, the following:

- 1) None.

SC-6.03.C Add the following immediately after Paragraph 6.03.C.5:

SC-6.03.C.5 If, at any time, the required insurance policies are canceled, terminated, or modified so that the insurance is not in full force and effect as required under the Contract Documents, Owner may terminate for cause in accordance with Paragraph 16.02 of the General Conditions or, where possible, obtain insurance coverage equal to that required by the Contract Documents, the full cost of which will be charged to Contractor and deducted from any payments due Contractor.

- a. Each Contractor shall require his subcontractors, at all tiers, to carry insurance coverages satisfactory to the Contractor and to provide evidence of such insurance as specified herein.

For purposes of this Bid, a Payment Bond will be required in an amount equal to the Bid Price and a Performance Bond will be required in a like amount.

SC-6.03.C.6 Add the following immediately after Paragraph 6.03.C.5:

SC-6.03.C.6 Contractor shall furnish to Owner and each other additional insured identified in the Contract Documents, to whom evidence of insurance has been issued, evidence satisfactory to Owner and other such additional insured of continuation of such insurance at final payment and for a duration thereafter equal to the correction period required under Paragraph 15.08.

SC-6.03.D Add the following new Paragraph 6.03.D:

D. The limits of liability for the insurance required by Paragraph 6.03 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

1. Workers' Compensation and Employer's Liability Insurance:

- a. State: Statutory

- b. Employer's Liability: In accordance with Table 00800-1 of these Supplementary Conditions.

- c. *Terminology:* The following terms are not defined but when used in this Paragraph SC-6.03.D for workers' compensation insurance, and have the meanings indicated below:

- 1) Certificate of coverage: A copy of a certificate of insurance, a certificate of authority to self-insure, issued by the Texas Workers Compensation Commission, or a coverage agreement (TWCC-81, TWCC-82, TWCC-83, or TWCC-84), showing statutory workers' compensation insurance coverage for the person's or entity's employees providing services on the Project, for the duration of the Project. Contractor shall not execute TWCC Forms 83 or 85 or other form that precludes coverage under Contractor's policy if Contractor hires a Subcontractor or service provider without worker's compensation insurance.

- 2) Duration of the Project: Is the time from the Contractor's beginning work on the Project until the time Contractor's and Subcontractor's obligations under the Contract Documents are fully complete.
 - 3) Contractor and Subcontractors (as indicated in Texas Labor Code §406.5096) includes all persons or entities performing all or part of the Work, regardless of whether that person or entity contracted directly with Contractor and regardless of whether that person or entity has employees. This includes, without limitation, independent contractors, Subcontractors, leasing companies, motor carriers, owner-operators, employees of any such entity, or employees of any entity which furnishes persons to provide services on the Project. "Services" include, without limitation, providing, hauling, or delivering equipment or materials, or providing labor, transportation, or other services related to the Project. "Services" does not include activities unrelated to the Project, such as food or beverage vendors, office supply deliveries, and delivery of portable toilets or portable sanitary facilities.
- d. Comply with the following relative to Worker's Compensation and Employer's Liability insurance:
- 1) *Waiver of Subrogation Relative to Workers' Compensation Insurance:* The policy shall be endorsed to provide that insurer waives any right of subrogation that insurer may acquire against Owner, Engineer, Engineer's consultants, and others named in the Contract Documents as additional insured relative to Contractor's liability insurance, by reason of any payment made on account of injury, including death resulting therefrom, sustained by an employee of the insured.
 - 2) If workers employed on the Work will be employed through a leasing company, furnish evidence of leasing company's State of Texas license and a copy of leasing company's Worker's Compensation policy insuring its employees (including sole proprietors, partners, supervisors, and executive officers) who perform work in the State of Texas.
 - 3) Contractor shall furnish coverage, based on proper reporting of classification codes and payroll amounts and filing of coverage agreements, which meets the statutory requirements of Texas Labor Code §401.011(44) for all employees of Contractor performing the Work or services on the Project, for the duration of the Project.
 - 4) Contractor shall furnish to Owner a certificate of coverage prior to being awarded the Contract.

- 5) If the coverage period shown on the Contractor's current certificate of coverage ends during the Contract Times, Contractor shall, prior to the end of the coverage period, furnish to Owner a new certificate of coverage indicating that coverage has been extended; furnish updated certificate of coverage throughout the duration of the Project.
- 6) *Subcontractors and Workers' Compensation and Employee Liability Insurance:*
 - a) Contractor shall contractually require each Subcontractor to comply with the workers' compensation and employer's liability insurance requirements of the Contract Documents, to same extent such requirements are binding on Contractor.
 - b) Obtain from each Subcontractor and furnish to Owner a certificate of coverage, prior to that Subcontractor beginning work on the Project. Not later than seven days after receipt by Contractor, furnish updated, valid certificate of coverage for each Subcontractor throughout the duration of the Project.
- 7) Retain Contractor's and Subcontractors' required certificates of coverage for the duration of the Project.
- 8) Contractor shall notify Owner in writing, in accordance with Paragraph 18.01, within 10 days after Contractor knew or should have known, of a change that materially affects the provision of coverage of any entity performing work or services on the Contract.
- 9) Post at the Site a notice, in the text, form, and manner prescribed by the Texas Workers' Compensation Commission, informing persons performing work or services on the Contract that they are required to be covered, and stating how a person may verify coverage and report lack of coverage. Such posted notice does not satisfy other posting requirements imposed by the Act or other commission rules in the State of Texas. Such notice shall be printed with a title in text that is not less than 30-point bold type, with and other text in not less than 19-point non-bold type, and shall be in English, Spanish, and other languages, if any, common to the workers at the Site. Text for the notices shall be as indicated by the Commission on the sample notice without changes.
- 10) By executing the Agreement or furnishing or causing to be furnished a certificate of coverage, Contractor represents to Owner that employees of Contractor and Subcontractors who will perform work or services on the Contract will be covered by workers' compensation coverage for the duration of the Project; that such coverage will be based on proper reporting

of classification codes and payroll amounts; and that coverage agreements will be filed with the appropriate insurance carrier or, in the case of a self-insured, with the commission's Division of Self-Insurance Regulation. Furnishing false or misleading information may subject Contractor to administrative penalties of authorities having jurisdiction, criminal penalties, civil penalties of authorities having jurisdiction, and other civil actions.

11) Contractor's failure to comply with one or more workers' compensation insurance provisions is a breach of the Contract by Contractor, entitling Owner to terminate for cause in accordance with Paragraph 16.03, unless otherwise provided by Laws and Regulations.

12) If any provision of the Workers' Compensation and Employee Liability insurance requirements of the Contract Documents, or its application to any person or circumstance, is held invalid, the invalidity does not affect other provisions or applications of this rule that can be given effect without the invalid provision or application, and to this end the provisions of this rule are declared to be severable.

2. Contractor's General Liability under Paragraphs 6.03 of the General Conditions which shall include completed operations and product liability coverages and eliminate the exclusion with respect to property under the care, custody, and control of Contractor. General Liability coverage shall be for not less than the limits indicated in Table 00800-1 of these Supplementary Conditions.
3. Automobile Liability under Paragraph 6.03 of the General Conditions: Shall be for not less than the limits indicated in Table 00800-1 of these Supplementary Conditions.
4. Umbrella Liability:
 - a. Contractor shall purchase and maintain, until final payment by Owner, Umbrella Liability Insurance. Such insurance shall insure against all claims in excess of the limits provided under workers' compensation and employer's liability, general liability insurance, and automobile liability policies. The limits of umbrella liability shall be in accordance with Table 00800-1 of these Supplementary Conditions.
5. *Table of Minimum Liability Insurance Coverage Limits:* The limits of liability insurance shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations. The limits of coverage under Paragraph 6.03 vary with the Contract Price as indicated in Table 00800-1:

TABLE 00800-1

LIMITS OF COVERAGE FOR ALL CONSTRUCTION PROJECTS	AUTOMOBILE (6.03) {Combined Single Limit} Per Accident	COMMERCIAL GENERAL LIABILITY (6.03) {Combined Single Limit} Per Project	WORKERS' COMPENSATION (6.03) {Employers' Liability} Per Accident Per Employee Per Disease	UMBRELLA (SC-6.03) {Combined Single Limit}
<p>CONTRACT PRICE LESS THAN \$100,000:</p> <p>Occurrence *General Aggregate Products/Completed Operations Aggregate</p>	\$300,000	<p>\$ 500,000 \$ 500,000 \$1,000,000</p>	<p>\$ 500,000 \$ 500,000 \$ 500,000</p>	Not applicable
<p>CONTRACT PRICE EQUAL TO \$100,000 OR GREATER AND LESS THAN \$500,000:</p> <p>Occurrence *General Aggregate Products/Completed Operations Aggregate</p>	\$500,000	<p>\$ 500,000 \$1,000,000 \$1,000,000</p>	<p>\$ 500,000 \$ 500,000 \$ 500,000</p>	Not applicable
<p>CONTRACT PRICE EQUAL TO OR GREATER THAN \$500,000 AND UP TO AND INCLUDING \$10,000,000:</p> <p>Occurrence *General Aggregate Products/Completed Operations Aggregate</p>	\$1,000,000	<p>\$1,000,000 \$2,000,000 \$2,000,000</p>	<p>\$1,000,000 \$1,000,000 \$1,000,000</p>	<p>\$2,000,000 \$2,000,000</p>
<p>CONTRACT PRICE GREATER THAN \$10,000,000:</p> <p>Occurrence *General Aggregate Products/Completed Operations Aggregate</p>	\$1,000,000	<p>\$1,000,000 \$2,000,000 \$2,000,000</p>	<p>\$1,000,000 \$1,000,000 \$1,000,000</p>	<p>\$5,000,000 \$5,000,000</p>

6.04 *Builder's Risk and Other Property Insurance*

SC-6.04 Delete Paragraph 6.04 in its entirety and insert the following in its place:

SC-6.04 *Property Insurance*

- A. Contractor shall purchase and maintain property insurance upon the Work at the Site in the amount of full replacement cost of the work. This insurance shall:
1. include the interests of Owner, Contractor, Subcontractors, Engineer, and other individuals or entities identified herein, and the officers, directors, members, partners, employees, agents and other consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured, additional insured, or loss payee as their interest may appear;
 - a. In addition to the individuals or entities specified above, include as additional insured, or loss payees as their interest may appear, the following:
 - 1) None
 2. be written on a Builder's Risk "all-risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than that caused by flood) and mechanical and electrical breakdown or failure, and damage to electrical apparatus from electrical currents;
 3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);
 4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;
 5. allow for partial utilization of the Work by Owner;

6. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other additional insured to whom a certificate of insurance has been issued.
- B. Contractor shall purchase and maintain equipment breakdown insurance which will include the interests of Owner, Contractor, Subcontractors, Engineer, and other individuals or entities identified as additional insured or loss payees in this Paragraph SC-6.04, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured, additional insured, or loss payee.
- C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with Paragraph SC-6.04 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured or loss payee to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph SC-6.05.
- D. The risk of loss within any deductible amount applicable to the policies of insurance purchased in accordance with this Paragraph SC-6.04 will be borne by Contractor, Subcontractors, or others suffering such loss.

6.05 *Property Losses; Subrogation*

SC-6.05 Delete Paragraph 6.05 in its entirety and insert the following in its place:

SC-6.05 *Waiver of Rights*

- A. Owner and Contractor intend that all policies purchased in accordance with Paragraph SC-6.04 will protect Owner, Contractor, Subcontractors, Engineer, and all other individuals or entities identified in Paragraph SC-6.04 to be listed as insureds or additional insured or loss payees (and the officers, directors, members, partners, employees, agents, and other consultants and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of loss or damage the insurers will have no rights of recovery against any of the insureds or additional insured or loss payees thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, members, partners, employees, agents and other consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors, Engineer, and

all other individuals or entities identified in Paragraph SC-6.04 to be listed as insureds or additional insureds or loss payees (and the officers, directors, members, partners, employees, agents and other consultants and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.

- B. Owner waives all rights against Contractor, Subcontractors, Engineer, and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them for:
1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire and other perils whether or not insured by Owner, and;
 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03 or after final payment pursuant to Paragraph 15.06.
- C. Any insurance policy maintained by Owner covering any loss, damage, or consequential loss referred to in Paragraph SC-6.05.B shall contain provisions to the effect that in the event of payment of any such loss, damage or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, Engineer, and the officers, directors, members, partners, employees, agents and other consultants and subcontractors of each and any of them.

ARTICLE 7 - CONTRACTOR'S RESPONSIBILITIES

7.03 *Labor; Working Hours*

SC-7.03 Add the following new subparagraphs immediately after Paragraph 7.03.C:

1. Regular working hours will be from Monday through Friday, 7:00 AM to 5:00 PM.
2. Owner's legal holidays are as recognized by the City of El Paso..

SC-7.03 Add the following new paragraph immediately after Paragraph 7.03.C:

- D. **Contractor** shall be responsible for the cost of any overtime pay or other expense incurred by the Owner for Engineer's services (including those of the Resident Project Representative, if any), Owner's representative, and construction observation services, occasioned by the performance of Work on Saturday, Sunday, any legal holiday, or as overtime on any regular work day. If Contractor is responsible but does not pay, or if the parties are unable to agree as to the amount

owed, then Owner may impose a reasonable set-off against payments due under Article 15.

SC-7.03 Add the following new subparagraph immediately after Paragraph SC-7.03.D:

1. For purposes of administering the foregoing requirement, additional overtime costs are defined as any hours over 40 hours per week and / or any hours worked on legal holiday. For these occasions a multiplier of 1.5 shall be applied to an hourly rate of \$142.00/hr.

SC-7.03.E Add the following new paragraph immediately after paragraph 7.03.D:

SC-7.03.E for work financed in whole or in part by loans or grants from, or loans insured or guaranteed by, the United States or any agency or instrumentality thereof under any statute of the United States providing wage standards for such work, the provisions of the Contract Documents are subject to the applicable provisions of the Contract Work Hours and Safety Standards Act, 40 U.S.C.A. §327 et seq. Contractor and Subcontractor shall not require or allow any laborer or mechanic to be employed on the Work in excess of forty hours in any work week unless such laborer or mechanic receives compensation at a rate not less than one-and-one-half times his or her basis rate of pay for hours worked in excess of forty hours in such work week. Except as may be otherwise required by law, all claims pertaining to the classification of labor employed on the project shall be decided by Owner's governing body or other duly designated official.

7.07 *Concerning Subcontractors and Suppliers*

SC 7.07.N Add the following new paragraphs immediately after Paragraph 7.07.M:

SC-7.07.N Contractor shall perform, with his organization and with the assistance of workers under Contractor's immediate superintendence, not less than 40 percent of the Contract Price, exclusive of Work not commonly found in contracts for similar construction which require specialized knowledge, craftsmanship, or equipment not ordinarily available in the organizations of contractors performing construction similar in nature to the Work. The value of the Work, exclusive of said items, will be interpreted as the value of labor, equipment, superintendence, and only those portions of materials and equipment incorporated into the Work that are related to the Contract's direct labor requirements.

7.09 *Permits*

SC-7.09.B *TPDES Permit and Related Permits and Requirements*

1. This Work is subject to the Texas Pollution Discharge Elimination System (TPDES) permitting requirements for the installation and maintenance of temporary and permanent erosion and sediment controls and stormwater pollution prevention measures throughout the construction period.

2. Contractor's responsibilities are as follows:
- a. Prepare a Storm Water Pollution Prevention Plan (SWPPP) prior to filing the "Notice of Intent" form.
 - b. File a "Notice of Intent" form with the TCEQ not less than two days prior to starting construction activity at the Site and pay for the permit. Form is available from Owner or on the Internet at <http://www.tceq.state.tx.us/assets/public/permitting/waterquality/forms/20022.pdf>. The form shall be mailed or submitted online to the TCEQ. For online submittal, the web address is <https://www.tceq.state.tx.us/steers/>. If Contractor has not already registered to use the TCEQ online application submittal service, it typically takes approximately ten working days to receive a username and password from TCEQ. No extension of the Contract Times will be granted for this activity. The mailing address is:

Texas Commission on Environmental Quality
Storm Water & General Permits Team; MC-228
P.O. Box 13087
Austin, TX 78711-3087
 - c. Submit to Owner a copy of the completed "Notice of Intent" form as submitted to TCEQ.
 - d. Obtain a signed certification statement from Subcontractors responsible for implementing erosion and sediment controls. Such statements shall indicate that Subcontractor understands the permit requirements. Such certified statement forms shall be attached to and become part of the SWPPP.
 - e. Post a notice near the main entrance of the Site with the following information.
 - 1) TPDES permit number for the Work or a copy of the Notice of Intent if a permit number has not yet been assigned,
 - 2) Name and telephone number of Contractor's local contact person,
 - 3) Brief description of the Work, and
 - 4) Location of the SWPPP if the Site is inactive or does not have an on-site location to store the SWPPP.
 - f. When posting this information near a main entrance is infeasible due to safety concerns, the notice shall be posted in a local public building. If the Work is linear (pipeline, highway, or other linear construction), the notice shall be placed in a publicly accessible location near where construction is actively underway and moved

as necessary. For linear Work, multiple postings of the information may be required by Owner.

- g. Maintain erosion and sediment controls and other protective measures identified in the SWPPP in effective operating condition.
- h. Perform inspections every 14 days and after every half-inch of rainfall, noting the following observations on an inspection form furnished by Owner:
 - 1) Locations of discharges of sediment or other pollutants from the Site.
 - 2) Locations of storm water, erosion, sedimentation controls that require maintenance.
 - 3) Locations of storm water, erosion, sedimentation controls that are not performing, failing to operate, or are inadequate.
 - 4) Locations where additional storm water, erosion, sedimentation controls are needed.

- i. Continuously maintain at the site a copy of the SWPPP (with all updates, as described below) and inspection reports.

Update the SWPPP as necessary to comply with TPDES permitting requirements, which includes noting changes in erosion and sedimentation controls and other best management practices that are part of the SWPPP and which may be necessary due to the results of inspection reports.

File a “Notice of Termination” with TCEQ within 30 days of final stabilization of all areas of disturbed soil and disturbed soil cover. Form is available from Owner or on the Internet at <http://www.tceq.state.tx.us/assets/public/permitting/waterquality/forms/20023.pdf>.

- j. “Notice of Termination” shall be mailed to:

Texas Commission on Environmental Quality
Storm Water & General Permits Team; MC-228
P.O. Box 13087
Austin, TX 78711-3087
(512) 239-4671

- k. Upon completion of the Work, submit to Owner TPDES records.

7.10 Taxes

SC-7.10.B Add the following new paragraph immediately after Paragraph 7.10.A:

SC-7.10.B Exemption from State of Texas sales tax may be obtained on materials and equipment incorporated into the Work and supplies required to perform the Work. Owner is an organization which qualifies for such exemption pursuant to provisions of Article 20.04(F) of the Texas Limited Sales, Excise and Use Tax Act. In accordance with Texas House Bill 11, Contractor may purchase, materials, equipment, and supplies consumed in the performance of the Work by issuing to Suppliers an exemption certificate in lieu of the tax, said exemption certificate complying with State of Texas Comptroller's Ruling No. 95-0.07. Such exemption certificate(s) issued by Contractor in lieu of the sales will be subject to the provisions of the State of Texas Comptroller's Ruling No. 95-0.09 as amended to be effective October 2, 1968. Exemption certificate may be obtained from Owner's Purchasing Agent.

7.11 *Laws and Regulations*

SC-7.11.C Remove last sentence on Paragraph 7.11.C. "If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such written notice Contractor may submit a Change Proposal, or Owner may initiate a Claim in its entirety."

SC-7.11.D Add the following new paragraph immediately after Paragraph 7.11.C:

SC-7.11.D *Minimum Prevailing Wage Rates*

1. Wage rates paid to workers employed in performing the Work at the Site, including Contractor and Subcontractor employees, shall not be less than the following:
 - a. Minimum prevailing wage rates of the City of El Paso, Texas. The prevailing minimum wage rate determination, comprised of 5 pages, applicable to the Project is part of the Contract Documents.
 - b. Federal Davis-Bacon minimum prevailing wage rates, comprised of 13* pages, which is part of the Contract Documents. Comply with 40 USC 31 and 29 CFR Parts 1, 3, and 5. (*See El Paso Wage Rates)
 - c. El Paso Water 2020 Building Construction Trades Wage Rates, comprised of 7 pages, applicable to the Project is part of the Contract Documents.

When a labor classification is included in both the City of El Paso and federal minimum prevailing wage rate determinations, Contractor shall pay the higher of the two minimum prevailing wage rates for that labor classification. Contractor shall be aware of changes in the minimum prevailing wage rates applicable to the Work and shall pay the minimum prevailing wages at no additional cost to Owner. Contractor shall post the schedule of classifications and wage rates at conspicuous locations at the Site.

Such schedule shall also show deductions, if any, required by law to be made from wages earned by laborers and mechanics engaged on the Work.

2. Contractor shall give preference to hiring qualified local residents for work as laborers and mechanics on the Project. Employees shall be bona-fide residents of the United States of America.
3. Contractor and Subcontractors shall pay each of their employees, engaged in the Work in full, not less often than once per week, and without deductions or subsequent rebates on any account, except for deductions mandated by law.
4. Contractor, and Subcontractors shall keep a complete payroll record indicating the name, address, and Social Security number of each employee engaged in the Work, together with the classification of work in which the employee is engaged, the hourly wage rate paid, number of deductions made from such wages and total amount paid to the employee. Submit to Owner one copy of each such payroll record, for the period for which payment is requested, with each Application for Payment. Each payroll record shall bear the affidavit of the employer certifying, under oath, that such payroll is a true, complete, and accurate report of the wages earned and paid to each employee engaged in the Work, that no deductions from any wages due each employee, except as set out on the payroll, have been directly or indirectly made, and that no rebates, either direct or indirect, have been nor will be required of an employee.
5. Certified payroll reports shall indicate for each worker whether the labor performed was performed under the Building, Heavy, Highway, or Water and Sewer Line Prevailing Wage Rate scale. Certified payroll reports shall be submitted for the complete Contract period and, for weeks where no Work was performed, negative reports shall be submitted, marked "No Work Performed". Clearly mark "FIRST PAYROLL" on the first payroll submitted, and clearly mark "FINAL PAYROLL" on the last payroll submitted for the Contract.
6. Apprentices will be work only under a bona fide apprenticeship program registered with the U.S. Department of Labor. A copy of such program shall be submitted to Owner, together with current certification or evidence of registration with the U.S. Department of Labor, Bureau of Apprenticeship and Training, for each apprentice engaged in the Work.
7. Contractor shall, when requested by Owner, submit additional certification and documentation (such as copy of cancelled check or an Employee Restitution Receipt Form) indicating that employee has received back compensation due.
8. Contractor and Subcontractors in violation of this provision are subject to a penalty of \$60 per day for each worker that is paid less than the rate specified in the Project's applicable prevailing wage rates.

SC-7.11.E Add the following new paragraph immediately after Paragraph 7.11.D:

SC-7.11.E *Mandatory for Building Projects with Contract Price Over \$100,000 – Apprentices*

1. In accordance with resolution adopted on November 9, 1999 by the El Paso City Council regarding apprenticeship programs on City projects, Contractor and Subcontractors shall:
 - a. Sponsor or participate in a U.S. Department of Labor (DOL) certified apprenticeship program for all job classifications utilized on the Project which are apprenticeable occupations as defined by DOL regulations and which appear on the “schedule of categories of apprentices” kept on file in the office of the City of El Paso's Capital Improvement Department;
 - b. Pay wage rates and benefits in accordance with the applicable apprenticeship program;
 - c. Comply with the DOL requirements for ratio of apprentices to journeymen;
 - d. Hire registered apprentices enrolled in a DOL-certified apprenticeship program in all job classifications utilized on the Project which are apprenticeable occupations as defined by DOL regulations and which are designated for City projects on the “schedule of categories of apprentices” kept on file in the office of the City of El Paso Director of Capital Improvement Department. Helpers, unregistered apprentices, and other substitutes shall not perform apprentice-level work in place of registered apprentices.
2. Contractor shall post the applicable prevailing wage rate schedules at the Site in a prominent location readily accessible to the workers throughout the Project. Contractor shall post a notice to be provided by the City of El Paso Director of Capital Improvement Department regarding prevailing wage rates and the City of El Paso’s apprenticeship program, in English and in Spanish, which shall be posted at the Site with the prevailing wage rates.
3. Contractor shall submit to Owner the names of all apprentices employed on the Work; verification of their status as registered apprentices; documentation regarding apprentice’s proper wage rates; and documentation regarding journeyman-to-apprentice ratios for each trade as determined by the apprenticeship program.
4. No worker shall be discharged by Contractor or Subcontractor, or in any other manner be discriminated against, because such worker has filed an inquiry or complaint, instituted legal or equitable proceeding, or has

testified or is about to testify in such proceeding under, or relating to, the apprenticeship program.

5. Contractor and Subcontractors shall allow immediate entry into all areas of the Site by Owner or Owner's agents and representatives displaying or presenting proper identification to Contractor's Site superintendent or their representative. Owner or their representative may visit the Site to determine adherence to these requirements, Contractor and Subcontractors shall allow access to personnel and apprenticeship program books and records and access to employees to be interviewed at random, at any time and for any reasonable duration to determine compliance with these provisions, including the apprenticeship programs.
6. Owner reserves the right to terminate for cause in accordance with Paragraph 16.02 if Contractor or Subcontractor breaches any of provisions of the Contract Documents regarding apprenticeship programs.
7. Apprentices shall be allowed to work at less than the predetermined rate for the work they performed when apprentice(s) are employed pursuant to, and individually-registered in, a bona-fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration Bureau; or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program but who has been certified by the Bureau of Apprenticeship & Training, or a state apprenticeship agency where appropriate, to be eligible for probationary employment as an apprentice.
8. The allowable ratio of apprentices to journeymen on the Work in any craft classification shall not be greater than the ratio permitted to the Contractor or Subcontractor as to the entire work force under the registered program. Any apprentice performing the Work in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate in the City Wage Scale for the work actually performed.
9. Contractor shall submit to Owner's Contract Administrator with sufficient information, which demonstrates that apprentices are employed pursuant to, and individually registered in, a bona-fide apprenticeship program. A copy of such program shall be submitted to Owner as well as the current certification for each individual assigned to the Work and appearing on the payrolls for that Contract. Every apprentice must be paid at not less than the rates specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman's hourly rate specified in the City wage determination. Workers not registered in a bona-fide apprenticeship program shall be paid not less than the applicable wage rate in the City Wage Scale for the classification of work actually performed. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the program does not specify fringe benefits, they must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Bureau of Apprenticeship & Training determines that a different practice

prevails for the applicable apprentice classification, fringe benefits shall be paid in accordance with that determination.

10. If the Bureau of Apprenticeship & Training or a state apprenticeship agency recognized by the Bureau, withdraws approval of a program, Contractor shall not employ apprentices at less than the applicable City rate for the work performed until an acceptable program is approved and evidence provided.

7.13 *Safety and Protection*

SC-7.13.B.1 Add following new subparagraph immediately after Paragraph 7.13.B:

SC-7.13.B.1 Contractor's safety representative shall be identified in submittal to Owner and Engineer for acceptance prior to commencement of Work at the Site. Name and qualifications of proposed substitute, if any, shall be submitted to Owner for acceptance.

SC-7.13.G Replace the word "safety program" with "Health and Safety Plan."

SC-7.13.H Replace the word "safety program" with "Health and Safety Plan."

SC-7.13.K Add the following new subparagraphs immediately after Paragraph 6.13.J:

SC-7.13.K Within twenty-four hours of receiving a request from Owner, Contractor shall furnish to Owner documentation substantiating representations made in the Health and Safety Plan including, but not limited to, that each of the Contractor's employees has received training on the Health and Safety Plan as well as any other training necessary to competently effectuate the Health and Safety Plan. Select Contractor project management staff shall complete the El Paso Water Online Contractor Orientation, (Course 19ELPWC) available at www.hasc.com, before start of construction.

SC-7.13.L Owner maintains a drug and alcohol-free workplace in accordance with the Drug-free Workplace Act of 1988. Contractor shall publicize a statement notifying employees on the Work that the unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance is prohibited in the workplace, including at the Site.

SC-7.13.M Owner maintains specific rules regarding smoking on Owner's properties. Contractor shall adhere to such rules at the Site.

SC-7.13.N Owner maintains specific rules regarding firearms and Contractor shall adhere to such rules at the Site.

SC-7.13.O Owner maintains specific rules regarding traffic safety on Owner's properties. Contractor shall adhere to such rules at the Site.

7.16 *Submittals*

SC-7.16.G Add the following new paragraphs immediately after Paragraph 7.16.F:

SC-7.16.G For each Contractor submittal required under the Contract Documents, Engineer will review one initial submittal and one resubmittal at no cost to Contractor. Engineer will record Engineer's time for reviewing subsequent submittals of Shop Drawings, Samples, or other submittals requiring approval or acceptance, and Contractor shall reimburse Owner for Engineer's charges for labor and expenses for such time.

SC-7.16.H In the event that Contractor requests a change of a previously approved or previously accepted submittal, Contractor shall reimburse Owner for Engineer's charges for Engineer's review time unless the need for such change is beyond Contractor's control.

ARTICLE 9 - OWNER'S RESPONSIBILITIES

9.11 *Evidence of Financial Arrangements*

SC-9.11 Delete Paragraph 9.11 in its entirety and insert the following in its place:

SC-9.11 Not used

ARTICLE 10 - ENGINEER'S STATUS DURING CONSTRUCTION

SC-10.03 Add a new paragraph immediately after Paragraph 10.03.B that is to read as follows:

SC-10.03.C Resident Project Representative (RPR) will be Owner's and/or Engineer's employee or agent at the Site, will act as directed by and under the supervision of Owner and/or Engineer, and will confer with Owner and/or Engineer regarding RPR's actions. RPR's dealings in matters pertaining to the Work in general shall be with Owner and/or Engineer and Contractor keeping Owner advised as necessary. RPR's dealings with Subcontractors shall only be through or with the full knowledge and approval of Contractor. RPR shall generally communicate with Owner with the knowledge of and under the direction of Engineer.

1. Duties and Responsibilities to RPR:

- a. Schedules: Review the Progress Schedule, Schedule of Submittals, and Schedule of Values prepared by Contractor and consult with Engineer concerning acceptability.

- b. Conferences and Meetings: Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings, and prepare and circulate copies of minutes thereof.

- c. *Safety Compliance*: Comply with Site safety programs, as they apply to RPR, and if required to do so by such safety programs, receive safety training specifically related to RPR's own personal safety while at the Site.

- d. Liaison:
 - 1) Serve as Engineer's liaison with Contractor, working principally through Contractor's superintendent, and assist in providing understanding of the intent of the Contract Documents.
 - 2) Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.
 - 3) Assist in obtaining from Owner additional details or information, when required for proper execution of the Work.

- e. Shop Drawings and Samples:
 - 1) Record date of receipt of Shop Drawings and Samples that are received at the Site.
 - 2) Receive Samples that are furnished at the Site by Contractor, and notify Engineer of availability of Samples for examination.
 - 3) Advise Engineer and Contractor of the commencement of any Work requiring a Shop Drawing or Sample if the submittal has not been approved by Engineer.

- f. Review of Work, Rejection of Defective Work, Inspections, and Tests:
 - 1) Conduct observations of the Work in progress on the Site to assist Engineer in determining if the Work is, in general, proceeding in accordance with the Contract Documents.
 - 2) Report to Engineer when RPR believes that any Work is unsatisfactory, faulty, or defective or does not conform generally to the Contract Documents, or has been damaged, or does not meet the requirements of any

inspection, test, or approval required to be made; and advise Engineer of Work that RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection, or approval.

- 3) Verify that tests, equipment, and systems startups, and operating and maintenance training are conducted in the presence of appropriate Owner's personnel and that Contractor maintains adequate records thereof; and observe, record, and report to Engineer appropriate details relative to the test procedures and startups.
 - 4) Observe Contractor-arranged inspections required by Laws and Regulations, including but not limited to those performed by public or other agencies having jurisdiction over the Work.
 - 5) Accompany visiting inspectors representing public or other agencies having jurisdiction over the Project, record the results of these inspections and report to Engineer.
- g. Interpretation of Contract Documents: Report to Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.
- h. Modifications: Consider and evaluate Contractor's suggestions for modifications to Drawings or Specifications and report with RPR's recommendations to Engineer. Transmit to Contractor decisions issued by Engineer.
- i. Records:
- 1) Maintain at the Site orderly files for correspondence, reports of job conferences, Shop Drawings and Samples, and reproductions of original Contract Documents including all Addenda, Change Orders, Field Orders, work change directives, additional Drawings issued subsequent to the execution of the Agreement, Engineer's clarifications and interpretations of the Contract Documents, progress reports, and other Project-related documents.
 - 2) Keep a record recording Contractor's hours on the Site, weather conditions, data relative to questions on Change Orders or changed conditions, list of visitors to the Site, daily activities, decisions, observations in general, and specific observations in more detail as in the case of observing test procedures; and send copies to Engineer.

- 3) Record names, addresses, and telephone numbers of all Contractors, Subcontractors, and major Suppliers of materials and equipment.
- 4) The RPR shall prepare a daily report or keep a daily diary that records weather conditions, the contractor's daily work activities, and specific observations. The RPR shall regularly photograph the work. The RPR shall maintain orderly files of correspondence, reports of job conferences, change orders, field orders, work change directives, daily reports and/or diaries, photographs and other similar documents. These documents shall be filed in Consultant's project record file. They shall be made available to Owner upon receipt of request from Owner and, if available, uploaded to cloud-based construction management software applications (or any other construction management software applications made available).

j. Reports:

- 1) Furnish Engineer periodic reports as required of progress of the Work and of Contractor's compliance with the Progress Schedule and Schedule of Submittals.
- 2) Consult with Engineer in advance of scheduled major tests, inspections, or start of important phases of the Work.
- 3) Prepare draft of proposed Change Orders, obtaining backup documents from Contractor, and provide recommendations to Engineer regarding Change Orders and Field Orders.
- 4) Report immediately to Engineer and Owner upon the occurrence of any Site accident, any Hazardous Environmental Condition, emergencies, or acts of God endangering the Work, or property damage by fire or other cause.

k. Payment Requests: Review Applications for Payment with Contractor for compliance with the established procedure for their submission, and submit recommendations to Engineer, noting particularly the relationship of the payment requested to the Schedule of Values, Work completed, and materials and equipment delivered at the Site but not incorporated in the Work.

l. Certificates, Maintenance and Operation Manuals: During the course of the Work, verify that certificates, maintenance and operation manuals, and other data required by the Specifications to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract

Documents, and have this material delivered to Engineer for review and forwarding to Owner prior to final payment for the Work.

m. Completion:

- 1) Before Engineer issues a certificate of Substantial Completion, submit to Contractor a list of observed items requiring completion or correction.
- 2) Observe whether Contractor has arranged for inspections required by Laws and Regulations, including but not limited to those to be performed by public authorities having jurisdiction over the Work.
- 3) Conduct final inspection in the company of Engineer, Owner, and Contractor, and prepare a final list of items to be completed or corrected.
- 4) Observe that all items on final list have been completed or corrected and make recommendations to Engineer concerning acceptance of the Work.

2. The RPR shall not:

- a. Authorize any deviation from the Contract Documents or substitution of materials or equipment, including “or equal” items.
- b. Exceed limitations of Engineer’s authority as set forth in the Contract Documents.
- c. Undertake any of the responsibilities of Contractor, Subcontractors, or Contractor’s superintendent.
- d. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences, or procedures of construction, unless such advice or directions are specifically required by the Contract Documents.
- e. Advise on, issue directions regarding, or assume control over safety precautions and programs in connection with the Work.
- f. Accept Shop Drawing or Sample submittals from anyone other than Contractor.
- g. Authorize Owner to occupy the Project in whole or in part.
- h. Authorize the use of any Unmanned Aircraft System (UAS or drone) without prior consent and authorization from Owner.
- i. Participate in specialized field or laboratory tests or inspections conducted by others except as specifically authorized by Engineer.

ARTICLE 11 - CHANGES TO THE CONTRACT

11.02 *Change Orders*

SC-11.02.C Add the following new paragraph immediately after Paragraph 11.02.B:

SC-11.02.C Change Order requests shall be accompanied by Contractor's time impact analysis for the Change Order request to be reviewed.

11.03 *Work Change Directives*

SC-11.03.A.1 Add the following new subparagraphs immediately after Paragraph 11.03.A:

SC-11.03.A.1 Without invalidating the Contract, OWNER may, by written Work Change Directive, using the Cost of the Work method, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Amount and Contract Time being adjusted as necessary. "Cost of the Work" means a basis of payment for the direct performance of Work with payment based on the actual cost of the labor, equipment and materials furnished and consideration for overhead and profit as set forth in Section 13.01, below. A Work Change Directive shall be used in the absence of complete and prompt agreement on the terms of a Change Order. Where practicable, any items of Work that may be agreed upon, prior to the performance of Work under this Section, will be included in a separate Change Order.

SC-11.03.A.2 If the Work Change Directive provides for an adjustment to the Contract Amount, the adjustment shall be based on the method provided in paragraph 13.01. The estimated value of the work issued under each individual Work Change Directive shall not exceed five (5) percent of the original contract price.

SC-11.03.A.3 A Work Change Directive shall be effective immediately and shall be recorded later by preparation and execution of an appropriate Change Order.

SC-11.03.A.4 Upon receipt of a Work Change Directive, CONTRACTOR shall promptly proceed with the change in the Work involved, provided, prior to the commencement of any Work under this section, the CONTRACTOR must submit its proposed Work plan, anticipated schedule, and a list of its work force and equipment proposed to be used in the Work for OWNER'S approval. Upon such approval, CONTRACTOR must promptly commence and make continuous progress in the Work. The OWNER reserves the right to withhold payment for low production or lack of progress.

11.07 *Change of Contract Price*

SC-11.07.C.2.c Delete 27 percent and replace with 25 percent.

SC-11.11 Add the following new paragraph immediately after Paragraph 11.10:

SC-11.11 Liquidated Damages:

- A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

- C. Liquidated Damages Relative to Substantial Completion and Readiness for Final Payment: Owner and Contractor recognize that time is of the essence as stated in Paragraph SC-11.11.A above and that Owner will suffer financial loss if the Work is not completed within the Contract Times for Substantial Completion, completion and readiness for final payment, and Milestones (if any) specified in the Contract Documents, plus any changes thereof allowed in accordance with Article 11 of the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty), Contractor shall pay Owner \$1812.26 for each day that expires after the time specified in the Contract Documents for Substantial Completion until the Work is substantially complete. After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by Owner, Contractor shall pay Owner \$1,181.46 for each day that expires after the time specified in the Contract Documents for completion and readiness for final payment until the Work is completed and ready for final payment.

ARTICLE 12 - CLAIMS

SC-12.01.B Add the following immediately after Paragraph 12.01.B:

- SC-12.01.B.1 In the event a delay Claim arises due to Standby Equipment Costs, Contractor must notify, through an RFI, Engineer and Owner no later than 72-hours in advance of such claim at which time Contractor, Engineer and Owner will evaluate the progress of the Work and determine if no other Work can be performed. Once that determination has been made, official response from Engineer and Owner acknowledging the delay at which point the Standby time will commence.

ARTICLE 13 - COST OF WORK; ALLOWANCES; UNIT PRICE WORK

13.01 *Cost of the Work*

SC-13.01 In Paragraph SC-13.01.A, delete the last sentence and replace with:

The provisions of this Paragraph 13.01 are used for **three** distinct purposes:

SC-13.01 Add the following new paragraph immediately after Paragraph 13.01.A.2:

- SC-13.01.A.3 If neither of the methods defined in paragraphs 13.01.A.1 nor 13.01.A.2 can be agreed upon before a change in the Work is commenced which will result in an adjustment in the Contract Amount, then the change in the

Work will be performed by Work Change Directive, using the Cost of the Work method, and payment will be made as described below:

SC-13.01 Supplement Paragraph 13.01.B.5.c.(2) by adding the following sentence:

The equipment rental rate book that governs the included costs for the rental of machinery and equipment owned by Contractor (or a related entity) under the Cost of the Work provisions of this Contract is the most current edition of “*Rental Rate Blue Book (Volumes 1-3), by Equipment Watch*”. Equipment or machinery with a value of less than \$1,000 will be considered small tools.

SC-13.01 Add the following new subparagraphs immediately after Paragraph 13.01.B.5.i:

SC-13.01.B.5.j Standby Equipment Costs: Standby equipment time will not exceed more than eight (8) hours per twenty-four (24) hour day, forty (40) hours per week, and one hundred seventy-six (176) hours per month Payment for standby equipment will be made in accordance with 13.01.B.5.c except that:

SC-13.01.B.5.j.(1) Contractor-Owned Equipment. For Contractor-owned machinery, trucks, power tools, or other equipment, Standby will be paid at 50% (to account for the removal of operating costs) of the rate established under 13.01.B.5.c.(2). Standby costs will not be allowed during periods when the equipment would have otherwise been idle.

SC-13.01.B.5.j.(2) Equipment Not Owned by the Contractor. For equipment rented from a third party not owned by the Contractor, Standby will be paid at the invoice daily rental rate, excluding operating cost, which includes fuel, lubricants, repairs, and servicing. The Owner reserves the right to limit the daily standby rate to comparable rates established under 13.01.B.5.c.(2). Standby will be paid for equipment operators when included on the invoice and equipment operators are actually on standby. Standby costs will not be allowed during periods when the equipment would have otherwise been idle.

SC-13.01 Supplement Paragraph 13.01.C.2 by adding the following definition of small tools and hand tools:

a. For purposes of this paragraph, “small tools and hand tools” means any tool or equipment whose current price if it were purchased new at retail would be less than \$1,000.

13.03 *Unit Price Work*

SC-13.03 Delete Paragraph 13.03.E in its entirety and insert the following in its place:

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:
 - a. the extended price of a particular item of Unit Price Work amounts to 10 percent or more of the Contract Price (based on estimated quantities at the time of Contract formation) and the variation in the quantity of that particular item of Unit Price Work actually furnished or performed by Contractor differs by more than **25** percent from the estimated quantity of such item indicated in the Agreement; and
 - b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.
2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.
3. Adjusted unit prices will apply to all units of that item.

ARTICLE 14 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

SC-14.02 Add the following new subparagraphs to Paragraph 14.02.B:

1. Re-Inspection Fees
 - a. Pay fees to the Owner to compensate the Owner's Representative as identified in Article 10 of the General Conditions for reinspection of the Work required by the failure of the Work to comply with the claims of status of completion made by the Contractor.
 - b. Owner may withhold the amount of these fees from the Contractor's final payment as stipulated in Article 15 of the General Conditions.
 - c. Cost for additional inspections will be billed to the Owner by the Owner's Representative for the actual hours required for the reinspection and preparation of related reports in accordance with the rates provided in the Supplemental Conditions SC-7.03.
2. Fees for Inspections Outside Normal Working Hours
 - a. If some or all of the Work has been determined to be required to be performed outside the normal working hours and or beyond the standard 40-hour work week as defined by Article 7 of the General Conditions, the Contractor is required to:
 - 1) Notify the Owner in advance of their intent to work outside regular working hours or working days;
 - 2) Determine if the work to be performed will require observation by the Owner's Representative or other agencies prior to covering the Work;

- b. Pay fees to the Owner to compensate the Owner's Representative as identified in Article 10 of the General Conditions for inspection of the Work performed outside normal working hours;
- c. Owner may withhold the amount of these fees from the Contractor's final payment as stipulated in Article 15 of the General Conditions.
- d. Cost for inspections will be billed to the Owner by the Owner's Representative for the actual hours required for the inspection and or observation of the work and preparation of related reports in accordance with the rates provided in the Supplemental Conditions SC-7.03.

ARTICLE 15 - PAYMENTS TO CONTRACTOR, SET OFFS; COMPLETIONS; CORRECTION PERIOD

15.01 Progress Payments

SC-15.01.D.1 Delete Paragraph 15.01.D.1 in its entirety and insert the following in its place:

SC-15.01.D.1 Thirty days after presentation of the Application for Payment to Owner by Contractor with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 15.01.E) become due, and when due will be paid by Owner to Contractor.

SC-15.01.D.1.(a) The thirty days' time will commence immediately after Owner acknowledges receipt of the Application for Payment from Contractor.

SC-15.01.D.1.(b) If upon review of the Application for Payment the Owner encounters any error (including, but not limited to, clerical, grammatical, informational, etc...) or lacks documentation as required by the Contract Documents, the Application for Payment will be deemed incomplete, and the Owner will reject the Application for Payment. The Owner will immediately notify the Contractor and Engineer the reason for the rejection of the Application for Payment. The thirty days' time allotted will reset and recommence once a corrected Application for Payment is received by Owner from Contractor.

SC-15.01.F Add the following new Paragraph 15.01.F:

SC-15.01.F For contracts in which the Contract Price is based on the Cost of Work, if Owner determines that progress payments made to date substantially exceed the actual progress of the Work (as measured by reference to the Schedule of Values), or present a potential conflict with the Guaranteed Maximum Price, then Owner may require that Contractor prepare and submit a plan for the remaining anticipated Applications for Payment that will bring payments and progress into closer alignment and take into

account the Guaranteed Maximum Price (if any), through reductions in billings, increases in retainage, or other equitable measures. Owner will review the plan, discuss any necessary modifications, and implement the plan as modified for all remaining Applications for Payment.

15.03 *Substantial Completion*

SC-15.03 Add the following new subparagraph to Paragraph 15.03.B:

1. If some or all of the Work has been determined not to be at a point of Substantial Completion and will require re-inspection or re-testing by Engineer, the cost of such re-inspection or re-testing, including the cost of time, travel and living expenses, will be paid by Contractor to Owner. If Contractor does not pay, or the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under this Article 15.

15.06 *Final Payment*

SC-15.06.B Delete the first sentence and replace with the following:

If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within 10 days after receipt of the final Application for Payment, indicate in writing **to Owner** Engineer's recommendation of final payment and **inform Contractor Final Payment Application is ready to be submitted to Owner for payment.**

SC-15.06.E Delete Paragraph 15.06.E in its entirety and replace with the following:

- E. **Final Payment Becomes Due:** Upon receipt from **Contractor of an approvable Application for Final Payment** and accompanying documentation, Owner shall set-off against the amount recommended by Engineer for final payment any further sum to which Owner is entitled, including, but not limited to, set-offs for liquidated damages and set-offs allowed under the provisions of this Contract with respect to progress payments. Owner shall pay the resulting balance due to Contractor within 30 days of Owner's receipt of the final Application for Payment from Contractor. An approvable application for final payment shall include Contractor and Subcontractor payrolls for the period covered in the final Application for Payment; an update of progress against the accepted Progress Schedule; and such other items as the Engineer may reasonably require.

15.08 *Correction Period*

SC-15.08 Add the following new Paragraph 15.08.G:

- G. The correction period specified as one year after the date of Substantial Completion in Paragraph 15.08.A of the General Conditions is hereby revised to be the number of years set forth in SC-6.01.B.1; or if no such revision has been

made in SC-6.01.B, then the correction period is hereby specified to be **2** years after Substantial Completion.

ARTICLE 16 - SUSPENSION OF WORK AND TERMINATION

16.02 *Owner May Terminate for Cause*

SC-16.02.A.5 Add the following new paragraphs immediately after Paragraph 16.02.A.4:

SC-16.02.A.5 If the Contract or any part thereof is sublet or assigned to another party by Contractor, without the written consent of Owner and surety that issued the performance bond and payment bond.

ARTICLE 17 - FINAL RESOLUTIONS OF DISPUTES

SC-17.02 Add the following new paragraphs immediately after Paragraph 17.01:

17.02 *Arbitration*

- A. All matters subject to final resolution under this Article will be settled by arbitration administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules (subject to the conditions and limitations of this Paragraph SC-17.02). Any controversy or claim in the amount of \$100,000 or less will be settled in accordance with the American Arbitration Association's supplemental rules for Fixed Time and Cost Construction Arbitration. This agreement to arbitrate will be specifically enforceable under the prevailing law of any court having jurisdiction.
- B. The demand for arbitration will be filed in writing with the other party to the Contract and with the selected arbitration administrator, and a copy will be sent to Engineer for information. The demand for arbitration will be made within the specific time required in Article 17, or if no specified time is applicable within a reasonable time after the matter in question has arisen, and in no event will any such demand be made after the date when institution of legal or equitable proceedings based on such matter in question would be barred by the applicable statute of limitations.
- C. The arbitrator(s) must be licensed engineers, contractors, attorneys, or construction managers. Hearings will take place pursuant to the standard procedures of the Construction Arbitration Rules that contemplate in-person hearings. The arbitrators will have no authority to award punitive or other damages not measured by the prevailing party's actual damages, except as may be required by statute or the Contract. Any award in an arbitration initiated under this clause will be limited to monetary damages and include no injunction or direction to any party other than the direction to pay a monetary amount.
- D. The Arbitrators will have the authority to allocate the costs of the arbitration process among the parties but will only have the authority to allocate attorneys' fees if a specific Law or Regulation or this Contract permits them to do so.
- E. The award of the arbitrators must be accompanied by a reasoned written opinion and a concise breakdown of the award. The written opinion will cite the Contract provisions deemed applicable and relied on in making the award.

- F. The parties agree that failure or refusal of a party to pay its required share of the deposits for arbitrator compensation or administrative charges will constitute a waiver by that party to present evidence or cross-examine witness. In such event, the other party shall be required to present evidence and legal argument as the arbitrator(s) may require for the making of an award. Such waiver will not allow for a default judgment against the non-paying party in the absence of evidence presented as provided for above.
- G. No arbitration arising out of or relating to the Contract will include by consolidation, joinder, or in any other manner any other individual or entity (including Engineer, and Engineer's consultants and the officers, directors, partners, agents, employees or consultants of any of them) who is not a party to this Contract unless:
 - 1. the inclusion of such other individual or entity will allow complete relief to be afforded among those who are already parties to the arbitration;
 - 2. such other individual or entity is substantially involved in a question of law or fact which is common to those who parties to the arbitration are already, and which will arise in such proceedings;
 - 3. such other individual or entity is subject to arbitration under a contract with either Owner or Contractor, or consents to being joined in the arbitration; and
 - 4. the consolidation or joinder is in compliance with the arbitration administrator's procedural rules.
- H. The award will be final. Judgment may be entered upon it in any court having jurisdiction thereof, and it will not be subject to modification or appeal, subject to provisions of the Laws and Regulations relating to vacating or modifying an arbitral award.
- I. Except as may be required by Laws or Regulations, neither party nor an arbitrator may disclose the existence, content, or results of any arbitration hereunder without the prior written consent of both parties, with the exception of any disclosure required by Laws and Regulations or the Contract. To the extent any disclosure is allowed pursuant to the exception, the disclosure must be strictly and narrowly limited to maintain confidentiality to the extent possible.

17.03 *Attorneys' Fees*

SC-17.03 Add the following new paragraph immediately after Paragraph 17.01:

17.03 *Attorneys' Fees*

- A. For any matter subject to final resolution under this Article, the prevailing party shall be entitled to an award of its attorneys' fees incurred in the final resolution proceedings, in an equitable amount to be determined in the discretion of the court, arbitrator, arbitration panel, or other arbiter of the matter subject to final resolution, taking into account the parties' initial demand or defense positions in comparison with the final result.

ARTICLE 18 - MISCELLANEOUS

SC-18.11 Add the following new paragraph immediately after Paragraph 18.10:

SC-18.11 *Use of Unmanned Aerial/Aircraft Systems (UAS)*

- A. The use of an UAS on all Owner property is strictly prohibited unless the following are met:
 - 1. The proposed flight is solely for purposes of Utility operations
 - 2. Authorization has been received from Owner to operate on or above Owner property
 - 3. All of the necessary federal, state, and local approvals have been acquired
 - 4. Compliance with federal, state, and local laws are met
 - 5. The Contractor has filed a flight plan with [AirMap](#) or any other Owner-approved Unmanned Aircraft System Traffic Management (UTM) ecosystem for uncontrolled operations that is separate from, but complementary to, the FAA's Air Traffic Management (ATM) system prior to flight operations
 - 6. The proposed flight does not photograph, video, or monitor in any way areas where members of the general public would have a reasonable expectation of privacy

- B. Any person or vendor, including but not limited to third parties seeking to operate a UAS on or above Owner property or at an Owner-sponsored event must submit a completed UAS (Drone) Use Approval Form to the Owner at least 10 business days in advance.

- C. The applicable Owner Representative (PM) who is an employee of the Owner will process the request for UAS use. After review and assessment of the request, the requestor will be notified of a decision or receive a request of additional information within five (5) business days.
 - 1. If approved, the PM will email a copy of the approved form to the Owner's Utility Security and Emergency Response (USER) Coordinator.

- D. The USER Coordinator will advise El Paso Police Department (EPPD) and Airport Operations (if the UAS will be near or entering restricted flight space) of UAS activity for situational awareness.
 - 1. If approved, a copy of the UAS Approval Form must be in possession by the pilot in command at all times during flight activity and must be presented to any EPWater official or representative with control or jurisdiction over the activity, upon request.

- E. The USER Coordinator will maintain a copy of the UAS (Drone) Use Approval Forms.

- F. Exceptions and Deviations

1. Contractors will be limited to the collection, use, retention, or dissemination of images and videos of Owner's critical infrastructure acquired by UAS.
2. The Owner's Utility Chief Operations Officer may waive the 10-business day notification requirement as deemed necessary.
3. UAS operators must only conduct approved flights under favorable conditions. If unforeseen circumstances develop (e.g. adverse weather) under which operations cannot be conducted in a safe manner, the operation must postpone the flight and request an extension from the Project Manager within 3 business days of the original date. If the extension is not requested within three (3) business days, a new UAS Approval Form must then be completed and submitted.
4. The use of UAS for hobby or recreational use on all EPWater property is always strictly prohibited. Using a UAS to take photographs or videos for personal use is considered recreational use and is prohibited.

SC-18.12 Add the following new paragraph immediately after Paragraph 18.10:

SC-18.12 *Working Near Utilities*

A. *Construction Adjacent to High Voltage Electric Lines:*

1. Contractor shall comply with Laws and Regulations, including U.S. Occupational Safety and Health Administration (OSHA) safety standards regarding construction adjacent to high-voltage electric lines and facilities, including trenching, crane operations, final grading, and other associated work which may result in impaired clearance to an existing electrical line or facility.
2. It is a violation of OSHA regulations to operate equipment in a manner that results in persons or equipment coming within ten feet of an energized electric line. Such Laws and Regulations are enforced by OSHA, and violators are subject to penalties imposed under federal Law.
3. Texas Law prohibits function or activity where it is possible for the person performing such activity to come within six feet of an overhead power line.
4. Contractor shall notify the El Paso Electric Company in writing of Contractor's anticipated dates and times when such work is scheduled. Written notification of El Paso Electric Company shall be at least six working days prior to each scheduled activity near El Paso Electric Company power lines and facilities, so that El Paso Electric Company personnel can coordinate with Contractor to provide proper clearance of energized electric lines. No other type of notice will be acceptable, and work shall not be initiated until

proper clearance and arrangements are confirmed by Contractor with the El Paso Electric Company.

5. Submit written notification to:

Raul Guel, Distribution Engineering Design
El Paso Electric Company
P. O. Box 982
El Paso, Texas 79960
(915) 543-4015

6. Simultaneously submit one copy of the notification letter to Owner's Contracts Development Manager and retain copy in Contractor's file.

7. Below are selected El Paso Electric Company phone numbers:

Claims Director	(915) 543-4158
Trouble & Emergencies	(915) 543-5720
Field Services/Power Consultants	(915) 543-2255
Cable Locator	(915) 543-4051

- B. Construction Adjacent to Gas Lines: Contractor shall comply with the One-Call Notification and System Protection Program developed by Southern Union Gas Company, and with State Damage Prevention Law, HB 2295:

- Contact Texas Gas Co. not less than two working days before commencing excavation activities
- Determine exact location of all underground utilities by safe and acceptable means
- Employ the two-foot safety rule
- Utilize "Professional Excavator's Manual" as revised

SC-18.13 Add the following new paragraph immediately after Paragraph 18.12:

SC-18.13 *EPCWID #1 Dewatering Permit Requirements*

- A. A license agreement for "Discharge of Foreign Waters into District Drain Ditches" is required between Owner and the El Paso County Water Improvement District (EPCWID) #1 before Contractor may begin dewatering operations. Contractor shall be a co-licensee with Owner. Terms and conditions of the license agreement are applicable to Contractor, who will function, relative to the license EPCWID #1 agreement only, as an agent of Owner, by preparing an approvable plan

and carrying out the terms of the plan and the EPCWID #1 license agreement. Contractor shall, to the extent permitted by law, defend and hold harmless Owner, its employees, insurers and agents; and the Engineer and Engineer's consultants, and their employees, officers, insurers, and agents from claims arising out of damages caused by actions, or inactions, of Contractor or as a result of EPCWID's exercise of any or all options given it under the license agreement.

- B. Contractor shall prepare and submit to Engineer a "Dewatering Plan", a "Final Schedule for Dewatering", and an estimate of fees due EPCWID #1. Submit "Dewatering Plan" within 15 days of the date that the Contract Times commence running. "Dewatering Plan" shall include the estimated quantities of dewatering for each month of the Contract, the design capacity and number of pumps to be used by Contractor, and the point(s) of dewatering pump discharge. Engineer will review for acceptability the "Dewatering Plan" and, when the submittal is acceptable to Engineer, Engineer will forward it, through Owner, to EPCWID #1. Prepare and submit the submittal and schedule the Work so that Owner receives the "Dewatering Plan" submittal not less than 14 days before the start of dewatering operations at the Site. Owner will pay the fees as estimated in the "Dewatering Plan".
- C. Estimate the dewatering fees on the following basis:
1. Drain maintenance fee of \$1,000 for each six months a discharge occurs. Fee for maintenance is non-refundable. Subsequent semi-annual fee payments are payable to Owner by Contractor in advance of each respective six-month period.
 2. Dewatering fee at the rate of \$150 per acre-foot of water discharged. For a month in which the discharge exceeds the amount estimated under the "Dewatering Plan", Contractor shall advise Owner and Engineer in writing, that such excess fees may be due so that the Owner may consider its liability for, and take action to make payment of, such excess fees to EPCWID #1. Owner will pay such excess fees only to the extent that such fees are incurred through no fault of Contractor.
- D. Samples of the discharge water shall be tested by a qualified testing laboratory hired by Contractor. Submit to Engineer results of total dissolved solids (TDS) tests, which Engineer will transmit to EPCWID #1. Submit to Engineer and Owner monthly reports of discharge quantities and quality (TDS and sulfates), which specific requirements may be more particularly indicated in the Specifications and in the associated discharge permit; Engineer will transmit monthly reports to EPCWID #1.
- E. Contractor will not be eligible for final payment by Owner until final dewatering fees based upon actual quantities and damages (if any) due EPCWID # 1 have been paid and payment due from Contractor has been

made. A “Final Release” from EPCWID # 1 shall be received by Owner as a condition precedent to Contractor applies for final payment.

SC-18.14 Add the following new paragraph(s) immediately after Paragraph 18.12:

SC-18.14 *Railroads*

- A. *Union Pacific Railroad Company Contractor's Right of Entry:* Contractor shall acquire and pay all associated expenses (including railroad company inspection fees), Contractor's right-of-entry from, the Union Pacific Railroad Company. Refer to Union Pacific Railroad's “Contractor's Right of Entry” form and its exhibits, included in the Project Manual following these Supplementary Conditions. Right-of-entry requirements are interrelated with the railroad liability insurance requirements and both are Contractor's cost responsibility. Contractor shall acquire railroad company's authorization prior to commencing work in the railroad right-of-way. Submit to Owner and Engineer executed copies of Contractor's “Right of Entry” form prior to commencing work on railroad property.
- B. *Railroad Liability Insurance:* Contractor shall obtain Railroad Liability Insurance in the form and amount required by the Union Pacific Railroad Company. Such insurance shall be in effect and cover all necessary work and operations required of Contractor within the railroad right-of-way. Refer to the railroad's “Contractor's Right of Entry” form and its exhibits. Insurance requirements of this paragraph are interrelated with the right-of-entry requirements in Paragraph SC-18.14.A and is Contractor's responsibility.
- C. For clarification of the requirements and costs of railroad permits and insurance, contact:

Manager Utilities Work
Union Pacific Railroad Company
Contracts and Real Estate Department
1400 Douglas Street STOP 1690
Omaha, Nebraska 68179-1690
Phone: (402) 544-8620
Fax: (402) 501-1519

SC-18.15 Add the following new paragraph immediately after Paragraph 18.14:

SC-18.15 Texas Water Development Board (TWDB) contracts require that all Contractors and subcontractors maintain project costs in a manner consistent with generally accepted accounting principles. All records are to be maintained for a minimum period of three years and beyond that minimum period if litigation, a claim, or an

audit is in process, or if audit findings are not resolved. The three-year period will begin upon completion of final payment.

***** END OF SUPPLEMENTARY CONDITIONS *****

REQUIRED WORKERS' COMPENSATION COVERAGE

(Title must be 30 point font & bold lettering)

(19 point font from here on)

The law requires that each person working on this site or providing services related to this construction project must be covered by workers' compensation insurance. This includes persons providing, hauling, or delivering equipment or materials, or providing labor or transportation or other service related to the project, regardless of the identity of their employer or status as an employee."

"Call the Texas Workers' Compensation Commission at 512-440-3789 to receive information on the legal requirements for coverage, to verify whether your employer has provided the required coverage, or to report an employer's failure to provide coverage."

* The above sign to be provided in both English and Spanish without any additional words or changes and shall be posted at the Project Site. Refer to Paragraph SC-6.03.D.1 of the Supplementary Conditions (Document 00800 in the Contract Documents).

SECTION 00810

EPWU CONTRACTOR INSURANCE COVERAGE CHECKLIST

Contractor Insurance Check List



Project	Arroyo 1 Dam Detention Improvements		
Bid Number	SWCSP 64-23		
Job Description	Excavate/reshape Arroyo 1 channel over approximately 1700 linear feet, comprising a new cut/fill of 30,100 CY. Install mortared rock rip-rap, gravel-filled soil stabilization system, articulated blocks, gabion mattress along the channel, and construct seven gabion basket weir drop structures. Construct a gravel-filled system maintenance access roadway for approximately 1900 linear feet.		
Contract Cost			
Final Completion			
Contractor			
Engineer			
Insurance Agent			
Performance & Payment Bonds	Bond Limit :		
	Surety:		
	Certified copy of Authority to Act	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Countersigned by Agent	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Workers' Compensation	Insurance Company / A.M. Best Rating		
	Policy Period	From:	To:
	Employers Liability Limits required		
	Employers Liability Limits provided		
	Waiver of Subrogation	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	30 Days Notice of Cancellation	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	If Employees Leased:		
	– Employee Leasing Company	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	– Texas State License	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	– Copy of Workers' Compensation Policy	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Commercial General Liability	Insurance Company / A.M. Best Rating		
	Policy Period	From:	To:
	Limits required		
	Limits provided		
	Products/Completed Operations – 2 Years after completion	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Personal Injury – Employment Exclusion deleted	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Contractual	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Broad Form Property Damage	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	XCU	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Additional Insured	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	30 Days Notice of Cancellation	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Business Auto	Insurance Company / A.M. Best Rating		
	Policy Period	From:	To:
	Limits required		
	Limits provided		
	Symbol 1	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Additional Insured	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Umbrella	Insurance Company / A.M. Best Rating		
	Policy Period	From:	To:
	Limits required		
	Limits provided		
	Follow Form – Additional Insureds and Waivers of Subrogation	<input type="checkbox"/> Yes	<input type="checkbox"/> No
30 Days Notice of Cancellation	<input type="checkbox"/> Yes	<input type="checkbox"/> No	

Contractor Insurance Check List



Builder's Risk/Installation Floater	Insurance Company / A.M. Best Rating		
	Policy Period	From:	To:
	Limits required		
	Limits provided		
	Deductible		
	- All Risk	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	- Flood	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	- Earthquake	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	- Testing	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	- Offsite Storage	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	- Transit	<input type="checkbox"/> Yes	<input type="checkbox"/> No
- Additional Interests	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
- Waiver of Subrogation	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Boiler & Machinery	- If required		
Certificates of Insurance	- All coverages		
Certified Copies of Policies	- All policies		
Requirements	Additional Insureds – Owner, Engineer and Engineer's Consultants on:		
	- CGL	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	- Auto	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	- Umbrella	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Waiver of Subrogation (Workers' Compensation) – Owner, Engineer and Engineer's Consultants		
		<input type="checkbox"/> Yes	<input type="checkbox"/> No
	30 Days Notice of Cancellation to Owner & Engineer by Certified Mail on:		
	- WC	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	- CGL	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	- Auto	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	- Umbrella	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	- Builder's Risk	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	- B&M (If required)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Builder's Risk/Installation Floater – Include Additional Insured interests & Waiver of Subrogation in favor of :		
	- Owner	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	- Contactor	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	- Subcontractor	<input type="checkbox"/> Yes	<input type="checkbox"/> No
- Engineer	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
- Engineer's Consultants	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Other			

Notice: This checklist is provided as a guide only and is not a substitute for the insurance requirements included in the EPWU contract. EPWU strongly advises contractors provide a copy of the contract insurance requirements to their insurance agents, consultants and providers to ensure their insurance coverages meet the contract insurance requirements.

SECTION 00820
EPWU STANDARD APPLICATION FOR PAYMENT

APPLICATION FOR PAYMENT NO. _____	Check One: PARTIAL ____ FINAL ____
--	------------------------------------

OWNER: El Paso Water Utilities Public Service Board 1154 Hawkins Blvd. El Paso, Texas 79925	PROJECT: <u>Arroyo 1 Dam Detention Improvements</u> BID NO.: <u>SWCSP 64-23</u> PURCHASE ORDER: _____
--	---

ORIGINAL CONTRACT AMOUNT: \$ _____	CONTRACT SUM TO DATE: \$ _____
NET CHANGE BY CHANGE ORDERS: \$ _____	THROUGH CHANGE ORDER NO. _____

NOTICE TO PROCEED: _____	CONTRACT COMPLETION DATE: _____
CONTRACT TIME: _____ Calendar Days	REVISED COMPLETION DATE: _____
REVISED: _____ Calendar Days	SUBSTANTIAL COMPLETION DATE: _____
ELAPSED TIME: _____ Calendar Days	FINAL COMPLETION DATE: _____

WORK COMPLETED:	\$ _____	<i>See Attached Pay Item Schedule</i>
MATERIALS STORED:	\$ _____	<i>Attach Invoices, Documentation</i>
TOTAL EARNED:	\$ _____	
LESS RETAINED: ____ %	- \$ _____	
LESS PREVIOUS PAYMENTS:	- \$ _____	
NET DUE THIS ESTIMATE:	\$ _____	<i>Attach Certified Payroll LCP Tracker Report this Period</i>

CONTRACTOR'S CERTIFICATION:

The undersigned CONTRACTOR certifies that (1) all previous progress payments received from OWNER on account of work done under the contract referred to above have been applied to discharge in full all obligations of CONTRACTOR incurred in connection with work covered by prior applications for payment; and (2) title to all materials and equipment incorporated in said work or otherwise listed in or covered by this application for payment will pass to Owner at time of payment free and clear of all liens, claims, security interests and encumbrances (except such as covered by bond acceptable to OWNER).

CONTRACTOR: _____	By: _____
	Title: _____
	Date: _____

RECOMMENDED:	APPROVED:
CONSTRUCTION MANAGER: _____	By: _____
By: _____	Title: _____
Date: _____	Date: _____

SECTION 00825
EPWU STANDARD APPLICATION FOR PAYMENT
(CONTINUATION PAGE)

AIA Document G702, APPLICATION AND CERTIFICATE FOR PAYMENT, containing Contractor's signed Certification is attached.
 In tabulations below, amounts are stated to the nearest dollar.
 Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NUMBER:
 APPLICATION DATE:
 PERIOD TO:
 ARCHITECT'S PROJECT NO:

A	B	C	D	E	F	G		H	I
ITEM NO.	DESCRIPTION OF WORK	SCHEDULED VALUE	WORK COMPLETED		MATERIALS PRESENTLY STORED (NOT IN D OR E)	TOTAL COMPLETED AND STORED TO DATE (D+E+F)	% (G+C)	BALANCE TO FINISH (C-G)	RETAINAGE
			FROM PREVIOUS APPLICATION (D+E)	THIS PERIOD					

SECTION 00830
PAY APPLICATION CHECKLIST



PAY APPLICATION CHECK LIST

REQUIRED ITEM/PROCESS	INCLUDED
1. Three original Pay Applications are included/submitted and are on the standard EPWU form (CM 11343A in the bid document).	
2. Substantial and Final Completion due dates listed match the bid document.	
3. Project adjustments (e.g., price, quantity, time, etc.) reflected in Work Directives or unexecuted Change Orders are NOT included in the Pay Application.	
4. If charges for paid materials are included in the Pay Application, include paid invoices for the stored material.	
5. Updated Construction Schedule is included	
6. Payrolls to be entered in the Utility Automated Payroll Software program, which include the following:	
a. For 'Negative Payrolls' during week(s) of no work performed, state, "No Work Performed" on those payrolls.	
b. If apprentices are used, submit DOL certification, apprenticeship programs and training periods for each apprentice. (Note: The DOL certificates expire every 90 days and must be renewed and current. If a current DOL certificate is not submitted for each apprentice, the employee must be paid the Journeyman's rate).	

If all requirements are not met or included in the Pay Application package, the Pay Application will be returned for revisions, and payment will not be made until EPW's receipt of 'approvable' Pay Application.

SECTION 00840
GENERAL WAGE REQUIREMENTS

SECTION 00840

GENERAL WAGE REQUIREMENTS

The following Wage Decision(s) will be utilized for this project. **A Wage Rate for one or both Wage Decisions for a construction type(s) included in the Contract Document, the Contractor is required to indicate on his Certified Payroll Reports, the Wage Decision description/construction type under which the works being reported. The wage decision(s) is/are attached to this form.**

CONSTRUCTION TYPE / WAGE DECISION	PORTION OF PROJECT FOR WHICH THE WAGE DECISION IS APPLICABLE
City of El Paso 2016 Paving and Street Construction, Dirt Work, Heavy Construction, Pipeline Work, Highway Wage Rates Adopted by El Paso City Council February 28, 2017	Entire Project



CITY OF EL PASO, TEXAS
2016 Paving and Street Construction, Dirt Work,
Heavy Construction, Pipeline Work, Highway Wage Rates

CLASSIFICATION	BASE WAGE PER HOUR	TOTAL FRINGES PER HOUR	HOURLY PREVAILING WAGE RATE	(8 HOURS) PER DIEM WAGE RATE
Asphalt Distributor Operator	14.64	0.00	14.64	117.12
Asphalt Paving Machine Operator / Spreader Box Operator	14.20	0.00	14.20	113.60
Asphalt Raker	12.99	0.00	12.99	103.92
Backhoe Operator	15.95	0.00	15.95	127.60
Concrete Finishers (Paving and Structures)	13.88	0.00	13.88	111.04
Crane Operator, Lattice Boom	17.50	0.00	17.50	140.00
Crane Operator, Hydraulic	17.50	0.00	17.50	140.00
Electrician	23.09	0.00	23.09	184.72
Excavator Operator	16.10	0.00	16.10	128.80
Form Builder/Setter	15.02	0.00	15.02	120.16
Form Setter (Paving and Curb)	12.86	0.00	12.86	102.88
Front End Loader	14.82	0.00	14.82	118.56
Laborer	11.89	0.00	11.89	95.12
Laborer (Skilled)(Utility)	13.65	0.00	13.65	109.20
Mechanic	17.50	0.00	17.50	140.00
Motor Grader Operator (Fine)	17.54	0.00	17.54	140.32
Pipe Layer	12.94	0.00	12.94	103.52
Reinforcing Steel Setter (Structure and Paving)/ Structural Steel Worker	17.00	0.00	17.00	136.00
Rock Mason	12.00	0.00	12.00	96.00
Roller Operator	13.70	0.00	13.70	109.60
Servicer	14.33	0.00	14.33	114.64
Truck Driver, Single Axle	13.19	0.00	13.19	105.52
Truck Driver, Tandem Axle	15.32	0.02	15.34	122.72
Utility Operator Grade 1	12.00	0.00	12.00	96.00
Utility Operator Grade 2	13.95	0.00	13.95	111.60
Welder, Certified/ Structural Steel Welder	13.83	0.00	13.83	110.64

All persons required to be licensed or certified must meet those qualifications to be paid the associated rate.

2016 HEAVY / HIGHWAY DEFINITIONS

1	Asphalt Distributor Operator	Drives distributor truck, sets spray bars and operates valves and levers to control distribution of bituminous material for highway surfacing. May oil, grease or otherwise service and make adjustments to equipment as needed. Performs other related duties.
2	Asphalt Paving Machine Operator/Spreader Box Operator	Operates paving machine that spreads and levels asphaltic concrete on highway. Controls movement of machine, raises and lowers screed, regulates width of screed. Operates spreader box by adjusting hopper and strike-off blade so that gravel, stone or other material may be spread to a specific depth on road surface during seal coat and surface treatment operations. May oil, grease, service and make adjustments to equipment as needed. Performs other related duties.
3	Asphalt Raker	Distributes asphaltic materials evenly over road surface by hand-raking and brushing material to correct thickness; may control screed to regulate width and depth of materials; directs Laborers (skilled and unskilled) when to add or take away material to fill low spots or to reduce high spots.
4	Backhoe Operator	Operates a rubber-tired machine mounted with a backhoe bucket on one end and a loader bucket on the other end. Used for excavating ditches and structures, laying pipe and precast concrete structures, carrying material in the loader bucket, and general excavation and backfill. May also be equipped with hydraulic attachments. May oil, grease or otherwise service and make necessary adjustments to equipment as needed. Performs other related duties.
5	Concrete Finisher (Paving and Structures)	Finishes the exposed surfaces of fresh concrete paving, median barrier and every element of concrete structures. Operates bridge deck finishing machine. Forms and finishes edges and joints. Finishes concrete curbs and gutters. Finishes exposed surface of concrete after forms have been removed by patching imperfections with fresh concrete, rubbing surface with abrasive stone, and directing others in removing excess or defective concrete with power tools. Performs other related duties.
6	Crane Operator, Lattice Boom	A worker who operates a lattice boom type crane to hoist and move materials, raise and lower heavy weights and perform other related operations. May be crawler type or rubber tired. May include placement of rock riprap, clamshell, dragline, pipe and pile driving operations. May oil, grease or otherwise service and make necessary adjustments to equipment as needed. Performs other related duties.
7	Crane Operator, Hydraulic	A worker who operates a hydraulic telescoping boom type crane to hoist and move materials, raise and lower heavy weights and perform other related operations. May be crawler type or rubber-tired. May oil, grease or otherwise service and make necessary adjustments to equipment as needed. Performs other related duties.

8	Electrician	Plan and execute the layout and installation of electrical conduit, switch panels, buss bars, outlet boxes, electrical wires and cables, lighting standards, lighting fixtures, receptacles, switches, and other electrical devices and apparatus necessary for the complete installation of wiring systems, works on overhead distribution systems and underground distribution systems. Includes installation of photovoltaic solar panels.
9	Excavator Operator	Operates a crawler or rubber-tired machine mounted with an excavator bucket. Used for excavating ditches and structures, laying pipe and precast concrete structures, loading trucks and placing rock riprap. May also be equipped with various hydraulic attachments. May oil, grease or otherwise service and make necessary adjustments to equipment as needed. Performs other related duties.
10	Form Builder/Setter	Works from plans to build, assemble, fit together, align, plumb, and set in place forms for molding concrete structures. Forms may be wood, steel, aluminum, fiberglass or any other type of material. Checks forms while concrete is being placed. May install miscellaneous materials integral to concrete structures. May set precast concrete elements. Prepares for slipforming traffic rail and median barrier. May install permanent metal deck forms. May work with power tools. Performs other related duties. Includes guardrail installation.
11	Form Setter (Paving and Curb)	Fits together, aligns and sets to grade metal and wooden forms for placement for concrete paving and curbs. Works with survey crew to set stringline for paving, curb and gutter and curb. Performs other related duties.
12	Front End Loader	Operates a rubber-tired, skid steer or crawler type tractor with an attached scoop type bucket on front end. Machine is used to load materials from stockpiles, excavation, charging batch plants, loading and unloading trucks. May be used with attachments in lieu of the bucket. May oil, grease or otherwise service and make necessary adjustments to equipment as needed. Performs other related duties.
13	Laborer	A general term used on construction work covering many unskilled classifications requiring work of a physical nature. Performs a variety of work ranging from pick and shovel work to cleaning up lumber with hammer, shoveling and placing concrete, uses air tools, under the supervision of qualified personnel. Cleans concrete joints and fills joints with sealing compound from bucket or with hose and nozzle from a central source, applies coating of oil to inside face of forms and strip forms, unloads and transports reinforcing steel, cures newly poured concrete, assists pipelayers, works with dirt crew keeping construction layout stakes out of the way of dirt-moving equipment. May fine grade excavation and ditches, shovels hot asphalt material. May use power tools and other necessary equipment in demolition work under the supervision of qualified personnel. Does not ordinarily perform work permitting exercise of independent judgment or without close direction by other workers. Installs and maintains erosion control. Performs other related duties.

14	Laborer (Skilled) (Utility)	Performs a variety of manual duties, usually working in a utility capacity by working on multiple projects and tasks where demands require workmen with varied experience and ability to work without close direction. Unloads and transports reinforcing steel. Directs laborers in pouring concrete. Erects trench shoring and bracing. Installs, operates, and maintains watering systems. May assist equipment operators in positioning machines, verifying grades and signaling operators to dumping positions to maintain grades as directed. Uses power tools and air tools. May work as lead man in a labor crew. Is more or less a general utility construction worker. May be a second step in learning a skill. Includes Concrete/Granite Pump Operator, Concrete Saw Operator, Fence Erector, Flagger, and Sign Erector. Performs other related duties.
15	Mechanic	Assembles, assist set up, adjusts and maintains and repairs all types of construction equipment and trucks. May perform the duties of a welder in repair of equipment. Performs other related duties.
16	Motor Grader Operator (Fine)	Operates motor grader. Performs many of the same duties of Motor Grader, Rough, but in addition performs finish grade work to bluetops or other close specification control. This work is subject to strict inspection and must conform closely to specifications. May oil, grease or otherwise service and make necessary adjustments to equipment as needed. Performs other related duties.
17	Pipe Layer	Installs concrete, clay, steel, ductile iron, plastic, corrugated pipe and any other type of pipe for storm drainage, water lines, gas lines and sanitary sewer lines. Lays underground communication and electrical ducts. May install and set electrical ground boxes, hand holes, manholes, inlets and other structures. Caulks joints, makes threaded and flanged connections. Installs valves and other accessories. Performs other related duties.
18	Reinforcing Steel Setter (Structure and Paving)/ Structural Steel Worker	Works from plans to lay out and install reinforcing steel within forms or in mats of concrete paving. Erects and places reinforcing steel and fabricated structural steel members, such as girders, plates, diaphragms, lateral bracing, and unites them permanently to form a completed structural steel unit, including reinforcing members. Fastens steel members together by welding or bolting. May include dismantling and erecting large units of equipment. Gives direction to reinforcing steel worker apprentice or utility laborers. Performs other related duties.
19	Rock Mason	Constructs partitions, fences, walls, using rock. Cutting, grouting and pointing of materials listed above which is necessary shall be part of this classification. May also build or repair rock retaining walls, cutting or placing of rock in mortar or other similar material.
20	Roller Operator	Operates a self-propelled machine with either steel wheels or pneumatic tires which is used to compact and smooth bituminous and flexible base materials and compact earth fills, subgrade, and all other types of materials. May oil, grease or otherwise service and make necessary adjustments to equipment as needed. Performs other related duties.

21	Servicer	Drives a truck which carries various fuels, oils, greases and filters. Must have knowledge of and is responsible for the correct oiling and greasing and changing of filters on equipment according to manufacturers' specifications. Uses compressed air grease guns, wrenches and other tools. May make adjustments to clutches, brakes and other mechanical items. Keeps record of service for preventive maintenance records. . May require a Commercial Driver's License if driving truck on public highways. Performs other related duties.
22	Truck Driver, Single Axle	Drives a light capacity truck for transporting loads of construction material. The truck is of single rear axle type, may have various kinds of beds attached such as dump, flat bed, tank, etc. May require CDL license for driving on highway. May service and make necessary adjustments for proper operation of equipment. Performs other related duties.
23	Truck Driver, Tandem Axle	Drives a tandem axle powered vehicle. Hauls dirt, rock, aggregates or other material. May require CDL license for driving on highway. May service and make necessary adjustments for proper operation of equipment. Performs other related duties.
24	Utility Operator Grade 1	Clam, ditching machine, side booms (except those in Grade 2), operator on dredges, cleaning machine, coating machine, , blending machine, water-kote machine, equipment welder, track tractor, derrick, dragline, shovel, motor grader rough grade, Crawler tractor, foundation drill operator, crawler and truck mounted, and piledriver.
25	Utility Operator Grade 2	Pipe, gin truck or winch truck with poles when used for hoisting, side boom (cradling rock drill), tow tractor, farm tractor road boring machine, fork lift (industrial type), pot fireman (power agitated), straightening machine, boring machine, bombardier (track or tow rig), , hydrostatic testing operator, scraper, staking machine, plant mix pavement roller operator, plant mix pavement, pneumatic motor operator. Concrete paving curing, float, texturing machine, subgrade trimmer, slip-form machine, milling machine, self-propelled sweeping machine, trenching machine, directional drill, , trenching, screening plant, and joint sealer. Off Road Hauler, Pavement Marking Machine Operator Reclaimer/Pulverizer Operator, Slurry Seal or Micro-Surfacing Machine Operator.
26	Welder, Certified/ Structural Steel Welder	Certified by the American Welding Society to perform structural steel welding. Operates welding equipment. Welds structural steel girders and diaphragms. May weld permanent metal deck forms. Cuts, lays-out, fits and welds metals or alloyed metal parts to fabricate or repair equipment. Welds the joints between lengths of pipe for oil, gas or other types of pipelines. May assist in welding of permanent metal deck forms. Performs other related duties.

SECTION 00850

TEXAS WORKERS' COMP FORMS DWC81-DWC85

TEXAS DEPARTMENT OF INSURANCE, DIVISION OF WORKERS' COMPENSATION
7551 Metro Center Drive, Suite 100
Austin, Texas 78744

If you are not certain whether all parties meet the requirements for entering into this agreement, you may wish to consult an attorney.

AGREEMENT BETWEEN GENERAL CONTRACTOR AND SUBCONTRACTOR
TO PROVIDE WORKERS' COMPENSATION INSURANCE

Notice of Agreement

The undersigned General Contractor and the undersigned Subcontractor hereby agree that the General Contractor will withhold will not withhold the cost of workers' compensation insurance coverage from the Subcontractor's contract price and that, for the purpose of providing workers' compensation insurance coverage, the General Contractor will be the employer of the Subcontractor and the Subcontractor's employees. This agreement makes the General Contractor the employer of the Subcontractor and the Subcontractor's employees only for the purposes of workers' compensation laws of Texas and for no other purpose.

TERM (DATES) OF AGREEMENT: FROM: _____
TO: _____

LOCATION OF EACH AFFECTED JOB SITE (OR STATE WHETHER THIS IS A BLANKET AGREEMENT):

ESTIMATED NUMBER OF EMPLOYEES AFFECTED: _____

THIS AGREEMENT SHALL TAKE EFFECT NO SOONER THAN THE DATE IT IS SIGNED.
Texas Labor Code, Texas Workers' Compensation Act, Section 406.123

General Contractor's Affirmation

If the General Contractor's workers' compensation carrier changes during the effective period of coverage, it is advisable for the General Contractor to file this form with the new insurance carrier.

Federal Tax I.D. Number

Signature of General Contractor

Date

Address (Street)

Printed Name of General Contractor

Address (City, State, Zip)

Subcontractor's Affirmation

Federal Tax I.D. Number

Signature of Subcontractor

Date

Address (Street)

Printed Name of Subcontractor

Address (City, State, Zip)

The General Contractor should retain the original. Legible copies of this agreement should be filed with the general contractor's workers' compensation insurance carrier and the Division within 10 days of the date of execution. If the General Contractor is certified self-insured, a copy should be filed with the Division's Self-Insurance Regulation service area. An agreement is not considered filed if it is illegible or incomplete. Filing may be accomplished by mail or facsimile transmission. The Subcontractor must also retain a copy of the agreement.

Division Date Stamp Here



TEXAS DEPARTMENT OF INSURANCE, DIVISION OF WORKERS' COMPENSATION
7551 Metro Center Drive, Suite 100
Austin, Texas 78744

If you are not certain whether all parties meet the requirements for entering into this agreement, you may wish to consult an attorney.

CHECK BOX OF STATEMENT THAT APPLIES

AGREEMENT BETWEEN MOTOR CARRIER
AND OWNER OPERATOR TO PROVIDE
WORKERS' COMPENSATION INSURANCE COVERAGE

Notice of Declaration

The undersigned Motor Carrier and the undersigned Owner Operator agree that the Motor Carrier will provide workers' compensation insurance coverage to the Owner Operator and the Owner Operator's employees. The Motor Carrier will deduct will not deduct the actual premiums, based on payroll, that are paid or incurred by the Motor Carrier for coverage from the contract price or any other amount owed to the Owner Operator by the Motor Carrier.

TERM (DATES) OF AGREEMENT: FROM: _____

TO: _____

ESTIMATED NUMBER OF WORKERS AFFECTED: _____
Texas Labor Code, Texas Workers' Compensation Act, Section 406.123.

AGREEMENT TO REQUIRE OWNER OPERATOR
TO ACT AS EMPLOYER

Notice of Agreement

The undersigned Motor Carrier and the undersigned Owner Operator agree that the Owner Operator assumes the responsibilities of an employer for the performance of work.

TERM (DATES) OF AGREEMENT: FROM: _____

TO: _____

ESTIMATED NUMBER OF WORKERS AFFECTED: _____
Texas Labor Code, Texas Workers' Compensation Act, Section 406.122.

THIS AGREEMENT SHALL TAKE EFFECT NO SOONER THAN THE DATE IT IS SIGNED.

MOTOR CARRIER'S AFFIRMATION

If the Motor Carrier's workers' compensation carrier changes during the effective period of coverage, it is advisable for the Motor Carrier to file this form with the new insurance carrier.

Federal Tax I.D. Number

Signature of Motor Carrier

Date

Address (Street)

Printed Name of Motor Carrier

Address (City, State, Zip)

OWNER OPERATOR'S AFFIRMATION

Federal Tax I.D. Number

Signature of Motor Owner Operator

Date

Address (Street)

Printed Name of Owner Operator

Address (City, State, Zip)

The Motor Carrier should retain the original. Legible copies of this agreement must be filed with the Motor Carrier's workers' compensation insurance carrier and the Division within 10 days of the date of execution. An agreement is not considered filed if it is illegible or incomplete. Filing may be accomplished by mail or facsimile transmission. The Owner Operator must also retain a copy of the agreement.

Division Date Stamp Here



TEXAS DEPARTMENT OF INSURANCE, DIVISION OF WORKERS' COMPENSATION
7551 Metro Center Drive, Suite 100
Austin, Texas 78744

If you are not certain whether all parties meet the requirements for entering into this agreement, you may wish to consult an attorney.

Texas Workers' Compensation Act, Texas Labor Code, Section 406.141(2) defines "independent contractor" as follows: (2) "Independent contractor" means a person who contracts to perform work or provide a service for the benefit of another and who: (A) is paid by the job, not by the hour or some other time-measured basis; (B) is free to hire as many helpers as he desires and to determine what each helper will be paid; and (C) is free to work for other contractors, or to send helpers to work for other contractors, while under contract to the hiring employer.

CHECK BOX OF STATEMENT THAT APPLIES

JOINT AGREEMENT TO AFFIRM INDEPENDENT
RELATIONSHIP FOR CERTAIN BUILDING
AND CONSTRUCTION WORKERS

Notice of Declaration

The undersigned Hiring Contractor and the undersigned Independent Contractor hereby declare that the Independent Contractor meets the qualifications of an Independent Contractor under Texas Workers' Compensation Act, Texas Labor Code, Section 406.141, that the Independent Contractor is not an employee of the Hiring Contractor, and that:

- (A) the Independent Contractor and the Independent Contractor's employees shall not be entitled to workers' compensation coverage from the Hiring Contractor; and
- (B) the Hiring Contractor's workers' compensation insurance carrier shall not require premiums to be paid by the Hiring Contractor for coverage of the Independent Contractor or the Independent Contractor's employees, helpers, or subcontractors.

THIS DECLARATION TAKES EFFECT UPON RECEIPT BY THE TEXAS DEPARTMENT OF INSURANCE, DIVISION OF WORKERS' COMPENSATION. THIS DECLARATION APPLIES TO ALL HIRING AGREEMENTS EXECUTED BY THE HIRING CONTRACTOR AND THE INDEPENDENT CONTRACTOR DURING THE YEAR AFTER THIS DECLARATION IS FILED UNLESS A SUBSEQUENT HIRING AGREEMENT IS MADE TO WHICH THE DECLARATION DOES NOT APPLY. IN THE EVENT THAT A HIRING AGREEMENT TO WHICH THIS DECLARATION DOES NOT APPLY IS MADE, THE HIRING CONTRACTOR AND INDEPENDENT CONTRACTOR SHALL SO NOTIFY THE TEXAS DEPARTMENT OF INSURANCE, DIVISION OF WORKERS' COMPENSATION AND THE HIRING CONTRACTOR'S WORKERS' COMPENSATION INSURANCE CARRIER (IF ANY) IN WRITING WITHIN 10 DAYS AFTER THE NON-APPLYING AGREEMENT IS MADE. ONCE THIS AGREEMENT IS SIGNED, THE SUBCONTRACTOR AND THE SUBCONTRACTOR'S EMPLOYEES SHALL NOT BE ENTITLED TO WORKERS' COMPENSATION COVERAGE FROM THE HIRING CONTRACTOR UNLESS A SUBSEQUENT WRITTEN AGREEMENT IS EXECUTED, AND FILED ACCORDING TO WORKERS' COMPENSATION RULES, EXPRESSLY STATING THAT THIS AGREEMENT DOES NOT APPLY.
Texas Labor Code, Texas Workers' Compensation Act, Section 406.145.

AGREEMENT TO ESTABLISH EMPLOYER-
EMPLOYEE RELATIONSHIP FOR CERTAIN
BUILDING AND CONSTRUCTION WORKERS

Notice of Agreement

The undersigned Hiring Contractor and the undersigned Independent Contractor hereby agree that the Hiring Contractor will withhold will not withhold the cost of workers' compensation insurance coverage from the Independent Contractor's contract price and that the Hiring Contractor will purchase workers' compensation insurance coverage for the Independent Contractor and the Independent Contractor's employees. Once this agreement is signed, for the purpose of providing workers' compensation insurance coverage, the Hiring Contractor will be the employer of the Independent Contractor and the Independent Contractor's employees. This agreement makes the Hiring Contractor the employer of the Independent Contractor and the Independent Contractor's employees only for the purposes of workers' compensation laws of Texas and for no other purpose.

TERM (DATES) OF AGREEMENT: _____ FROM: _____
TO: _____

LOCATION OF EACH AFFECTED JOB SITE (OR STATE WHETHER THIS IS A BLANKET AGREEMENT):

ESTIMATED NUMBER OF EMPLOYEES AFFECTED: _____

THIS AGREEMENT SHALL TAKE EFFECT NO SOONER THAN THE DATE IT IS SIGNED.

Texas Labor Code, Texas Workers' Compensation Act, Section 406.144.

Hiring Contractor's Affirmation

If the Hiring Contractor's workers' compensation carrier change during the effective period of coverage, it is advisable for the Hiring Contractor to file this form with the new insurance carrier.

Federal Tax I.D. Number

Signature of Hiring Contractor

Date

Address (Street)

Printed Name of the Hiring Contractor

Address (City, State, Zip)

Independent Contractor's Affirmation

Federal Tax I.D. Number

Signature of Independent Contractor

Date

Address (Street)

Printed Name of the Independent Contractor

Address (City, State, Zip)

The Hiring Contractor should retain the original. Legible copies of this agreement should be filed with the hiring contractor's workers' compensation insurance carrier and the Division within 10 days of the date of execution. An agreement is not considered filed if it is illegible or incomplete. Filing may be accomplished by mail or facsimile transmission. The Independent Contractor should also retain a copy of the agreement.

Division Date Stamp Here



TEXAS DEPARTMENT OF INSURANCE, DIVISION OF WORKERS' COMPENSATION
7551 Metro Center Drive, Suite 100
Austin, Texas 78744

EXCEPTION TO APPLICATION OF JOINT AGREEMENT TO AFFIRM INDEPENDENT
RELATIONSHIP FOR CERTAIN BUILDING AND CONSTRUCTION WORKERS

NOTICE OF DECLARATION

The undersigned Hiring Contractor and the undersigned Independent Contractor declare that the Joint Agreement to Affirm Independent Relationship for Certain Building and Construction Workers (as recorded on DWC FORM-83) does not apply to the subsequent hiring agreement between the Hiring Contractor and Independent Contractor. Nothing in this declaration otherwise nullifies the Joint Agreement to Affirm Independent Relationship for Certain Building and Construction Workers as it applies to other hiring agreements made during the term of the joint agreement.

DATE OF JOINT AGREEMENT TO AFFIRM INDEPENDENT
RELATIONSHIP FOR CERTAIN BUILDING AND CONSTRUCTION
WORKERS

DATE OF SUBSEQUENT HIRING AGREEMENT TO WHICH THIS
FORM APPLIES

LOCATION OF SPECIFIC JOB SITES NOT AFFECTED BY JOINT AGREEMENT:

NAME OF HIRING CONTRACTOR

NAME OF INDEPENDENT CONTRACTOR

Texas Labor Code, Texas Workers' Compensation Act, Section 406.145.

Hiring Contractor's Affirmation

If the Hiring Contractor's workers' compensation carrier changes during the effective period of coverage, it is advisable for the Hiring Contractor to file this form with the new insurance carrier.

Federal Tax I.D. Number

Signature of Hiring Contractor

Date

Address (Street)

Printed Name of Hiring Contractor

Address (City, State, Zip)

Independent Contractor's Affirmation

Federal Tax I.D. Number

Signature of Independent Contractor

Date

Address (Street)

Printed Name of Independent Contractor

Address (City, State, Zip)

The Hiring Contractor should retain the original. Legible copies of this agreement should be filed with the hiring contractor's workers' compensation insurance carrier and the Division within 10 days of the date of execution. An agreement is not considered filed if it is illegible or incomplete. Filing may be accomplished by mail or facsimile transmission. The Independent Contractor should also retain a copy of the agreement.

Division Logo Stamp Here



TEXAS DEPARTMENT OF INSURANCE, DIVISION OF WORKERS' COMPENSATION
7551 Metro Center Drive, Suite 100
Austin, Texas 78744

If you are not certain whether all parties meet the requirements for entering into this agreement, you may wish to consult an attorney.

Texas Workers' Compensation Act, Texas Labor Code, Section 406.121(2) defines "independent contractor" as follows: (1) "Independent contractor" means a person who contracts to perform work or provide a service for the benefit of another and who ordinarily: (A) acts as the employer of any employee of the contractor by paying wages, directing activities, and performing other similar functions characteristic of an employer-employee relationship; (B) is free to determine the manner in which the work or service is performed, including the hours of labor or method of payment to any employee; (C) is required to furnish or have his employees, if any, furnish necessary tools, supplies, or materials to perform the work or service; and (D) possesses the skills required for the specific work or service.

AGREEMENT BETWEEN GENERAL CONTRACTOR AND SUBCONTRACTOR
TO ESTABLISH INDEPENDENT RELATIONSHIP

Notice of Agreement

The undersigned General Contractor and the undersigned Subcontractor hereby declare that:

- (A) the Subcontractor meets the qualifications of an Independent Contractor under Texas Workers' Compensation Act, Texas Labor Code, Section 406.121;
- (B) the Subcontractor is operating as an independent contractor as that term is defined under Section 406.121 of the Act;
- (C) the Subcontractor assumes the responsibilities of an employer for the performance of work; and
- (D) the Subcontractor and the Subcontractor's employees are not employees of the General Contractor for purposes of the Act.

TERM (DATES) OF AGREEMENT: FROM: _____

TO: _____

Name of General Contractor

Name of Subcontractor

LOCATION OF EACH AFFECTED JOB SITE (OR STATE WHETHER
THIS IS A BLANKET AGREEMENT):

Estimated number of employees affected: _____

THIS AGREEMENT SHALL TAKE EFFECT NO SOONER THAN THE
DATE IT IS SIGNED.

Texas Labor Code, Texas Workers' Compensation Act, Section 406.122 .

General Contractor's Affirmation

If the General Contractor's workers' compensation carrier changes during the effective period of coverage, it is advisable for the General Contractor to file this form with the new insurance carrier.

Federal Tax I. D. Number

Signature of General Contractor

Date

Address (Street)

Printed Name of General Contractor

Address (City, State, Zip)

Subcontractor's Affirmation

Federal Tax I. D. Number

Signature of Subcontractor

Date

Address (Street)

Printed Name of Subcontractor

Address (City, State, Zip)

The General Contractor should retain the original. The Subcontractor should also retain a copy of the agreement. This form is not required to be filed with the Division, and may be provided to the insurance carrier.

Division Data Stamp Here



TECHNICAL SPECIFICATIONS

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SECTION 01 10 00 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes Work covered by Contract Documents, Contractor use of site, and Owner occupancy.
- B. Related Requirements:
 - 1. Other Division 01 Specification Sections apply to the Work of this Section.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- A. Identification: Arroyo 1 Dam Detention Improvements.
 - 1. Location: El Paso, Texas, intersection of Bear Ridge Drive and Franklin Hills Street.
 - 2. Owner: El Paso Water Utilities Public Service Board.
- B. Project scope involves construction of gabion weir drop structure and gabion weir slope protection after channel excavation:
 - 1. Excavate and enlarge approximately 30,100 CY of existing Arroyo 1.
 - 2. Fill approximately 5,400 CY of existing Arroyo 1.
 - 3. Install seven gabion weir drop structures.
 - 4. Install aggregate soil stabilization system.
 - 5. Install approximately 6,800 SY of gabion mattress slope protection.
 - 6. Install approximately 350 SY of articulated concrete block slope protection.
 - 7. Install approximately 13,540 SY of mortar rock rip rap.
 - 8. Miscellaneous services.
- C. Provide preconstruction video, mobilization, temporary construction facilities, coordination, submittals, testing, warranty services, and required fees.
- D. Contractor should make a site visit to determine accessibility and location of Project. Contractor required to make all necessary arrangements for temporary storage/staging yard.

1.3 CONTRACTOR USE OF PREMISES

- A. Construction Operations: Limited to areas adjacent to construction site within channel easement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 CONTRACT TIME

- A. Completion of Project within allotted time is of the essence. Contractor shall commit all necessary forces and equipment to complete Project within contract time allowed meeting Project milestones.

- B. Milestone durations are based on calendar dates after start of Contract Time as determined by Engineer. Milestones for Project are as follows:

MILESTONE #	DESCRIPTION	CALENDAR DAYS
1	SUBSTANTIAL COMPLETION	180
2	FINAL COMPLETION	210

- C. Contractor shall include in his bid and Project duration, all allowances for lost time due to weather and unforeseen delays. Extra compensation not allowed for lost days due to weather.

3.2 CONTRACTOR'S RESPONSIBILITY FOR COMPLETE FACILITY

- A. It is the intent of these Specifications that the Project be complete workable facility, functioning per general description provided; therefore, it is direct responsibility of Contractor to furnish, install, and construct complete facilities required by Plans and Specifications for prices stated in Contract, and take account of all subsidiary requirements of equipment furnished to that end, so entire facility functions per specified requirements.

3.3 ENGINEER AND CONTRACTOR RESPONSIBILITIES

- A. Engineer Responsibilities:
1. Arrange for and deliver Engineer-reviewed Shop Drawings, Product Data, and Samples, to Contractor.
 2. On delivery, inspect Products jointly with Contractor.
- B. Contractor Responsibilities:
1. Review product submittals for compliance with Specifications, and Engineer-reviewed Shop Drawings, Product Data, and Samples.
 2. Receive and unload products at site. Inspect for completeness and/or damages jointly with Engineer.
 3. Handle, store, install, and finish work.
 4. Repair or replace items damaged after receipt.
- C. Resident Project Representative (RPR):
1. Engineer, Owner-approved RPR, and other engineering field staff, as required to assist Engineer, are agents of Owner as stipulated in Agreement between Owner and Engineer.
 2. RPR duties and responsibilities are limited to those of Engineer in Agreement with Owner and Contract Documents.
 3. RPR dealings in matters pertaining to Contractor work in progress shall generally be with Engineer and Contractor, keeping Owner advised, as necessary. RPR dealings with subcontractors shall only be through or with full knowledge and approval of Contractor. RPR to generally communicate with Owner under Engineer knowledge and direction.

3.4 RIGHT-OF-WAY

- A. All work is located on property belonging to the City of El Paso or drainage easements.
- B. Contractor shall use minimum area practicable for constructing facilities, regardless of type of right-of-way, and be governed by specific requirements for each type of right-of-way as set out in contract documents and agency permits.
- C. Excess excavated material shall be removed from rights-of-way and disposed of by Contractor as required by governing agency and/or owner of right-of-way.

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- D. All rights-of-way shall be restored, at minimum, to original condition. If necessary, verification of existing conditions provided by viewing videotapes showing Project site prior to construction. Viewings are intended to resolve any potential disputes as to condition of right-of-way prior to construction.

3.5 CITY OF EL PASO STREETS

- A. General: Construction adjacent to El Paso roadway right-of-way, shall cause minimum inconvenience to adjacent property.
- B. Traffic Control Plan: Contractor shall prepare a traffic control plan and submit to the City of El Paso for approval at least three weeks prior to beginning construction. Contractor shall not begin work until Traffic Control Plan is approved and a copy provided to Engineer. Traffic Control Plan shall be prepared by Contractor per Texas manual on Uniform Traffic Control Devices (latest revision).

3.6 EL PASO WATER EASEMENTS

- A. Contractor shall confine his operations to limits of permanent and temporary easements indicated on Drawings.

3.7 WARRANTY

- A. Contractor shall warrant 100 percent of Project for one year after date of Substantial Completion of work.
- B. Contractor shall remedy any defects in materials and workmanship and pay for all damages resulting thereof, for entire duration of warranty period, at no cost to Owner. Performance Bond shall also cover all expenses incurred by Owner in notification of claim, administration, engineering, RPR services, and other warranty related expenses to Owner.

3.8 CONTRACTORS SUPERINTENDENCE

- A. Contractor shall keep on Project, at all times during progress, qualified competent Resident Superintendent, satisfactory to Engineer. Resident Superintendent shall speak English fluently and communicate with the Public, Engineer, and Owner. Superintendent shall be cooperative and authorized to receive orders and act for Contractor. If competent Superintendent not available, Owner may suspend work until one is available. Changes of Superintendent must be approved by Engineer and Owner.
- B. All workers employed by Contractor shall have such skill and experience as will enable them to properly perform duties assigned. Any person employed by Contractor or subcontractor who, in Engineer's opinion, does not perform work properly and skillfully, or is disrespectful, intemperate, disorderly, or otherwise objectionable, shall at written request of Engineer be forthwith reassigned or discharged and not be deployed again on any portion of work without written consent of Engineer.

3.9 SAFETY AND SECURITY

- A. Contractor is always fully responsible for safety and security of all work areas. Security includes protection of Owner and Contractor properties. Contractor shall prevent access of animals and unauthorized persons onto site and be particularly careful to prevent contamination of potable water facilities by fencing, signs, temporary closure of excavations, or other means, and maintain throughout course of work including nighttime, weekend, and

holiday periods. Work procedures deemed inadequate by Engineer to meet this requirement shall be immediately corrected by Contractor.

3.10 LICENSES, PERMITS, AND REPORTS

- A. Contractor is responsible for obtaining all permits other than those listed, as required for Project. Contractor shall, at his own expense, procure all other permits required.
- B. Contractor shall possess all required permits at the job site. Contractor shall comply with all state and local laws, ordinances, rules, and regulations relating to work performance.

3.11 EMERGENCY COMMUNICATIONS PROCEDURE

- A. Because prompt action is necessary in case an emergency, Contractor shall maintain, at all times during construction, a local phone listing where responsible, supervisory personnel may be contacted 24-hours-a-day. Phone number shall be given to dispatcher of El Paso Water Utilities (915.594.5775) so contact can be made in the event of emergency.

3.12 AS-BUILT DIMENSIONS AND DRAWINGS

- A. Contractor shall make appropriate and accurate daily measurements of facilities constructed (horizontal and vertical) and keep accurate records of all facilities. Contractor's "as-built" drawings will be reviewed as condition of payment each month based on remaining up-to-date and acceptably accurate to site conditions. Upon completion of each facility, Contractor shall furnish Engineer with one set of direct prints, marked with red pencil, to show as-built dimensions and locations of work constructed.

3.13 LOCATION AND PROTECTION OF EXISTING FACILITIES

- A. Contractor is fully responsible for all underground facilities shown on Drawings, located by Contractor with reasonable effort, or brought to Contractor attention in any manner. He is not held responsible for such underground facilities with respect to which he otherwise had no previous knowledge. Contractor is responsible for notifying Engineer if any unknown facilities are uncovered and protecting facilities after uncovered.
- B. Contractor is responsible for protecting all electric poles, light poles, etc., along pipeline routes. Contractor shall provide whatever temporary shoring necessary to ensure all poles are adequately supported, braced, etc. so pole does not sink, shift, tilt, or otherwise move from original position. Any removing guy wires/anchors and setting any wires/anchors, is at Contractor expense. Any measures Contractor uses to support any type of pole, is based upon prior approval of Engineer and pole owner.
- C. Contractor shall coordinate with the City of El Paso, Texas Gas Service, Southwestern Bell Telephone Company, AT&T, El Paso Electric, El Paso Water Utilities, subcontractors, and any other utility company for relocating, bypassing, or protecting existing utilities. Any work associated with relocating or bypassing existing utilities, shall be reflected in Contractor schedule. To complete work expeditiously and without delay to Project, all requirements of Contract Documents apply to utility or subcontractor performing any relocating, bypassing, or protecting existing utilities. All work associated with relocating, bypassing, or protecting existing utilities, is at Contractor expense, unless otherwise noted on Drawings. Prior to commencement of any relocation or bypass work, Contractor shall submit plan for carrying out work to Engineer for approval.

3.14 DAMAGE TO PRIVATE PROPERTY

- A. Contractor is responsible for any damage to private property caused by construction Project. Contractor, upon receiving complaint of damage, shall within 30 days, respond in writing with proposal to repair said damage or letter with reasons explaining why damage not caused by construction.
- B. Except for extenuating circumstances beyond Contractor's control, damage shall be repaired completely within 60 days of complaint.

3.15 NIGHTTIME, HOLIDAY, AND WEEKEND WORK

- A. If Contractor performs work between hours of 5 p.m. and 7 a.m., or exceeds eight hours per day, Monday through Friday, or on Saturdays, Sundays, or legal holidays, he shall request permission from Owner, through Engineer, in writing, at least seven days in advance of starting such work. Contractor shall acquire any necessary permits associated with such work and comply with all permit conditions, laws, and ordinances relating thereto.
- B. Owner, Engineer, and Contractor shall review RPR and supervisor requirements for extended work hours. Engineer will determine additional RPR requirements, based on work to perform.
- C. Contractor shall reimburse Owner and any other entity for additional overtime inspection costs incurred because of providing additional inspection personnel when Contractor performs nighttime, weekend, or legal holiday work, or work more than eight hours per day, and 40 hours per week. Ultimately, final adjustment for overtime costs will be brought into change order to Contract. Additional RPR costs will be handled as follows:
 - 1. Cost of overtime will be deducted from Contractor's monthly application for payment, for each month costs are incurred.
 - 2. Overtime hours computed as all hours outside a normal 40-hour, five-day work week and eight hours per workday.
 - 3. Additional inspection cost will be \$176.00 per hour, applying to each RPR on Project.

3.16 APPROVAL OF EQUIPMENT AND MATERIALS

- A. All materials shall be new and designed for function and service specified herein. No materials used in Project except those approved by Engineer. Approval for installation or incorporation in Project, given only after submittal and subsequent examination of shop and installation drawings, manufacturer's specifications, test results, or other data required in various Sections of these Specifications. Final approval and acceptance of items made only after such items are in operation and have met all specified tests.

3.17 SHOP DRAWING REVIEW COSTS

- A. One initial shop drawing submittal and one resubmittal will be reviewed by the Engineer at no cost to Contractor. Subsequent reviews on resubmitted shop drawings will be reviewed by Contractor of \$137.00 per hour.

3.18 TRENCH EXCAVATION SAFETY SYSTEM

- A. Contractor required to install a trench safety system to provide for safe excavating all trenches equal to or exceeding 5 feet deep as per OSHA standards. Contractor shall certify trench safety to use under this Contract is in compliance with all applicable rules and regulations established by OSHA.

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- B. Contractor's attention is directed to Bid Item "Trench Safety System," where full compensation will be made for all designs, testing, materials, equipment, and labor required to furnish, install, and remove trench safety system regardless of method used to make trench excavation safe.
 - C. Contractor and all subcontractors hold duty and responsibility to be familiar with and comply with all requirements of Public Law 91-586, 29 U.S.C. Secs. 650 et seq., Occupational Safety and Health Act of 1970 (OSHA), and all amendments thereto, and to enforce and comply with all provisions of this Act. In addition, on a project where trench excavation exceeds 5 feet deep, Contractor and all subcontractors shall comply with requirements of 29 C.F.R. Secs. 1926.650 through 1926.252, OSHA Safety and Health Regulations for Construction, more fully described herein, and shall require a pay item classification, as described, for particular safety system to be utilized by Contractor.
 - D. Successful low bidder required to submit six sets of trench excavation plans with trench safety system through Owner to Engineer for review within 15 calendar days after Notice of Award.
 - E. Plans must be designed and sealed by a professional engineer registered in Texas with professional experience in geotechnical engineering. Contractor is responsible for obtaining borings and soil analysis as required for design and preparation of trench excavation plan and trench safety system.
 - F. No trenching more than 5 feet below existing grade allowed until trench excavation system and safety plan is reviewed and returned to Contractor. Any changes in trench excavation plan after initiation of construction not because of Extension of Time or Change Order but such changes will require same review process as original excavation system and safety plan.
 - G. Contractor accepts sole responsibility for compliance with all applicable safety requirements. Engineer review shall be only cursory in nature and only intended to ensure Contractor has a trench safety system and plan prior to starting construction, meets OSHA requirements, and designed and sealed by a registered professional engineer licensed in Texas.
 - H. Review of trench excavation/safety plan does not relieve Contractor of any responsibility for construction means, methods, techniques, and procedures. Any property damage or bodily injury, including death resulting from use of Contractor's trench safety equipment or system, shall remain sole responsibility and liability of Contractor.

3.19 STAKING OUT OF THE WORK

- A. Engineer sets horizontal control points and semi-permanent benchmarks as shown on Drawings. Contractor is responsible for all construction surveying, field staking, installing all pipelines, and other work to lines and grades established from Engineer's survey control points.
- B. Contractor must familiarize himself before commencing work as to meaning or correctness of all horizontal control points and benchmarks, and no claim entertained on account of any alleged inaccuracies, unless Contractor notified Engineer in writing before commencing work. Contractor is held responsible to preserve all control points and benchmarks in positions: in case any are lost or destroyed, all expenses incurred by Engineer in replacing them shall be charged against Contractor and paid for by him before completion and final acceptance of work. Payment for staking out work included in per unit price of pipeline installed as shown on proposal.

3.20 VIDEO DOCUMENTATION OF PROJECT

- A. Prior to any construction, Contractor, accompanied by Engineer or representative, shall video Project Site and site access to show existing conditions of Project area, adjacent properties, equipment, tanks, structures, and utilities.

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- B. Video shall be converted to DVD format and two copies of DVD given to Engineer. Submitted materials shall include permanent labeling indicating: Project title, Owner bid number, Contractor information, and recording date.

3.21 SEQUENCE OF CONSTRUCTION

- A. Contractor to remove bollards and install construction entrance/exit.
- B. Contractor to start excavating channel at Sta. 1+00.00 and proceed upstream.
- C. Contractor to install gabion weirs.
- D. Contractor to install gabion mattresses.
- E. Contractor to install aggregate soil stabilization system.
- F. Contractor to install mortar rock riprap.
- G. Contractor to install gates and driveways.
- H. Contractor to install wrought iron fence.

3.22 SUBSTANTIAL COMPLETION

- A. Substantial Completion is when, in Engineer opinion, work is installed to sufficient completeness per Contract Documents, so work can be fully utilized for purposes intended. To attain substantial completion, work must pass specified testing associated with work per Contract Documents. No significant work can remain incomplete on Project to attain this Substantial Completion status.
- B. At Engineer's discretion, operation by Owner and Contractor written request for Substantial Completion may occur even though items of work, or groups of work items, are not entirely complete. If Engineer approves, incomplete items shall only be items not preventing full operation of new facilities. Incomplete items only considered as minor punchlist items for Substantial Completion to be declared.

3.23 FINAL COMPLETION

- A. Final Completion obtained once Contractor completes all punch-list items to Engineer satisfaction, submitted red-lined, as-built drawings, and all Contract closeout documentation.

3.24 PAYMENT

- A. Payment made for all Work covered in this Section included in unit prices per item or lump sum price per job, as indicated in Proposal. Such payments shall be complete compensation for complete performance of work per Drawings and provisions of these Specifications.

END OF SECTION

SECTION 01 20 00 - PRICE AND PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Schedule of Values.
 - 2. Application for Payment.
 - 3. Change Procedures.
 - 4. Measurement and payment – unit prices.
- B. Related Requirements:
 - 1. Other Division 01 Specification Sections apply to Work of this Section.

1.2 SCHEDULE OF VALUES

- A. Submit Schedule of Values within 15 days after date established in Notice to Proceed.
- B. Format: Utilize Bid Items 1 through 15 as defined in Section 01 22 00 “Price and Payment Procedures” of this Project Manual. Identify each line item with bid number and title, separating labor and material for each line item.
- C. Include within each line item, a directly proportional amount of Contractor's overhead and profit.
- D. Revise schedule to list approved Change Orders with each Application for Payment.

1.3 APPLICATIONS FOR PAYMENT

- A. Submit application on Owner-Provided Application for Payment.
- B. Content and Format: Utilize Schedule of Values for listing items in Application for Payment.
- C. Payment Period: As defined in Owner-Contractor agreement.
- D. Complete Application for Payment includes Construction progress schedule, and submittal schedule, all required to process Application for Payment.

1.4 CHANGE PROCEDURES

- A. Submittals: Submit name of person authorized to receive change documents and responsible for informing others in Contractor’s employ or subcontractors of changes to Work.
- B. Carefully study and compare Contract Documents before proceeding with fabricating and installing Work. Promptly advise Engineer of any error, inconsistency, omission, or apparent discrepancy.
- C. Requests for Information (RFI) and Clarifications: Allot time in construction scheduling for liaison with Engineer. Establish procedures for handling queries and clarifications.
 - 1. Use Contractor’s standard RFI for requesting information.
 - 2. Engineer may respond with Newforma generated RFI Transmittal Letter.
- D. Engineer will advise of minor changes in the Work not involving adjustment to Contract Price or Time by issuing supplemental instructions on Newforma generated SI Transmittal Letter.

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- E. Engineer may issue “Change Order,” including a detailed description of proposed change with supplementary or revised Drawings and Specifications for executing change. Contractor will prepare and submit proposed change in Contractor Price and/or Time within seven days.
 - F. Contractor may propose changes by submitting a request for change to Engineer, describing proposed change, and its full effect on Work. Include a statement describing reason for change, effect on Contract Price and Time, with full documentation.
 - G. Stipulated Price Change Order: Based on Contractor’s fixed price quotation a recommended by Engineer and accepted by Owner and Contractor.
 - H. Document each quotation for change in Project Cost or Time with sufficient data to allow evaluation of quotation.
 - I. Execution of Change Orders:
 - 1. Engineer will issue Change Orders for signatures of parties as provided in Conditions of the Contract.
 - J. Correlation of Contractor Submittals:
 - 1. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as separate line item and adjust Contract Price.
 - 2. Promptly revise Progress Schedules to reflect change in Contract Time, revise sub-schedules to adjust times for other items of Work affected by change, and resubmit.
 - 3. Promptly enter changes in Record Documents.

1.5 UNIT PRICES

- A. Authority: Measurement methods delineated in Section 01 22 00 “Unit Prices.”
- B. Take measurements and compute quantities. Engineer to verify.
- C. Unit Quantities: Quantities and measurements indicated in Bid Form are for Contract purposes only. Quantities and measurements supplied or placed in Work determine payment. When actual Work requires more or fewer quantities than those indicated, provide required quantities at contracted unit prices.
- D. Payment Includes:
 - 1. Full compensation for required labor, products, tools, equipment, plant, transportation, services, and incidentals;
 - 2. Erection, application, or installation of Work item;
 - 3. Overhead and profit.
- E. Final payment for Work governed by unit prices will be made based on actual measurements and quantities accepted by Engineer multiplied by unit price for Work incorporated in or made necessary by Work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 22 00 – MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes procedures for measurement and payment plus conditions for nonconformance assessment and nonpayment for rejected products.
- B. Related Sections:
 - 1. Other Division 01 Specification Sections apply to work of this Section.

1.2 AUTHORITY

- A. Measurement methods delineated in specification sections are intended to complement the criteria of this section. In the event of conflict, the requirements of the specific specification section shall govern.
- B. The Engineer will take all measurements and compute quantities accordingly.
- C. The Contractor shall assist the Engineer by providing necessary equipment, workers, and survey personnel as required by the Engineer.

1.3 UNIT QUANTITIES SPECIFIED

- A. Quantity and measurement estimates stated in the Bid Form are for contract purposes only. Quantities and measurements supplied or placed in the Work and verified by the Engineer shall determine payment as stated in the General Conditions.
- B. If the actual Work requires greater or lesser quantities than those quantities indicated in the Bid Form, the Contractor shall provide the required quantities at the unit prices contracted, except as otherwise stated in the General Conditions, the contract drawings, or other sections within the specifications.

1.4 METHODS OF MEASUREMENT OF QUANTITIES

- A. Measurement by Weight: Reinforcing steel, rolled or formed steel or other metal shapes will be measured by CRSI or AISC Manual of Steel Construction weights. Welded assemblies will be measured by CRSI or AISC Manual of Steel Construction or by use of scale weights.
- B. Measurement by Volume:
 - 1. Stockpiles: Measured by cubic dimension using mean length, width, and height or thickness.
 - 2. Excavation and Embankment Materials: Measured by cubic dimensions using the average end area method.
- C. Measurement by Area: Measured as a square dimension using either mean length and width or radius of a circle (or portion of a circle).
- D. Linear Measurement: Measured by linear dimension, at the item centerline or mean chord.
- E. Stipulated Price Measurement: Measured by unit designated in the agreement.
- F. Other: Includes items measured by weight, volume, area, or lineal means or combinations, as appropriate, as a completed item or unit of the Work.

1.5 NONCONFORMANCE ASSESSMENT

- A. The Contractor shall remove and replace the Work, or portion of the Work, not conforming to the Contract Documents at no expense to the Owner.
- B. If, in the opinion of the Engineer, it is not practical to remove and replace the Work, the Engineer will direct one of the following remedies:
 - 1. The nonconforming Work will remain as is, but the unit price will be adjusted to a lower price at the discretion of the Engineer.
 - 2. The nonconforming Work will be modified as authorized by the Engineer, and the unit price will be adjusted to a lower price at the discretion of the Engineer, if the modified Work is deemed to be less suitable than originally specified.
- C. Specification sections may modify these options or may identify a percentage or specific equation to be used for a price reduction.
- D. The authority of the Engineer to assess the nonconforming Work and identify payment adjustment is final.

1.6 NONPAYMENT FOR REJECTED PRODUCTS

- A. Payment will not be made for any of the following:
 - 1. Products wasted or disposed of in a manner that is not acceptable to the Engineer.
 - 2. Products determined as nonconforming before or after placement.
 - 3. Products not completely unloaded from transporting vehicle.
 - 4. Products placed beyond the lines and levels of the required Work.
 - 5. Products remaining on hand after completion of the Work, unless specified otherwise.
 - 6. Loading, hauling, and disposing of rejected products.

1.7 REQUIREMENTS

- A. The general scope of work under each bid item includes all labor, equipment and materials required for construction of completely functional and operational facilities as shown on the Drawings and in these Specifications.
- B. All estimated quantities for unit price bid items stipulated in the bid proposal are approximate and are to be used only (a) as a basis for estimating the probable cost of the work and (b) for the purpose of comparing the bids submitted for the work. The actual amount of work done, and materials furnished under unit price items may differ from the estimated quantities. The basis of payment for unit price work and materials will be the actual amount of work done and material furnished as measured by the Engineer.
- C. All measurements and payments will be based on completed and accepted work performed in strict accordance with the Drawings and Specifications and in accordance with contract unit bid prices. Incidental work and items not listed in the contract-unit bid price schedule will not be paid for separately but will be included in the payment for the listed item or items and shall be full compensation for all labor, equipment, materials, testing and incidentals necessary to perform the work in accordance with these contract documents.
- D. Separate payment will not be made for related items of subsidiary work but will be considered as part of the bid items in the proposal. Payment will be made for all work covered in this section at the contract unit price bid items or be included in the lump sum bid item prices for items in the proposal. Such payment shall be complete compensation for the complete performance of the work in accordance with the drawings and the provisions of these specifications.

PART 2 - PRODUCT (Not Used)

PART 3 - EXECUTION

3.0 MEASUREMENT

A. General :

Two general classes of pay items exist consisting of:

1. **Unit price Items:** Payment for the various unit price items will be made at the particular contract price per unit as shown on the proposal. The unit price for the individual pipeline items shall specifically include all costs associated with the following: construction staking, construction facilities, coordination, site preparation, excavation, thrust restraint, backfilling and compacting for utilities, protection of adjacent utilities and pertinent structures, all pipe bedding, all pipe and accessories, joint bonding and test stations, concrete, and all other items of the project not indicated as being covered under the other specific bid items shown in the Proposal. Such payment shall be complete compensation for the complete performance of the work in accordance with the drawings and the provisions of these specifications.
2. **Lump Sum Items:** Lump sum items are to be paid for at a lump sum price per job, not in measured increments. Lump sum items shall include all work and materials involved in the installation, construction or performance of work, including incidental and subsidiary items as may be required to complete that item as shown on the drawings and designated in the specifications.
3. The description of work for the individual bid items is a general description of the work, with the items listed as a general guide for the work to be performed. This description is limited and is not meant to be all inclusive. The Contractor is responsible for determining the items necessary to complete the work and include such in his stated bid price for the work.

3.1 MOBILIZATION, INSURANCE, BONDS, AND MOVE-IN RELATED EXPENSES (BID ITEM 1)

- A. Measurement for mobilization and demobilization shall be on a Lump Sum (L.S.) basis for the mobilization and demobilization of equipment, support vehicles, personnel and tools, for the completion of the part of the project for which it pertains.
- B. Payment shall include all costs for Contractor's mobilization and demobilization, insurance and bond, construction permits and fees, Health and Safety Plan, job trailers, site administration expenses, standpipe and temporary meter service, expenses for noise mitigation, utilities to the job trailers including power, telephone and construction water needs. This shall include all costs for contract closeout, site cleanup, and all costs associated with Contractor's demobilization from site. This bid item shall be limited to a maximum of five (5) percent of the total bid price. A maximum of 60 percent of the mobilization bid amount will be paid for mobilization to the project. The remainder will be paid for demobilization after demobilization of the project occurs.

3.2 FURNISH AND PROVIDE PRE-CONSTRUCTION VIDEO, COMPLETE IN PLACE
(BID ITEM 2)

- A. Measurement for furnishing and providing pre-construction video shall be on a lump sum basis.
- B. Payment includes full compensation for videotaping of the project site and surrounding areas prior to any construction. Project shall be videotaped by the Contractor accompanied by the Engineer to show existing conditions of the project area, adjacent properties, structures and utilities that have been located and marked. The video tape shall be converted to DVD format. Two copies of the videotape along with two DVD discs for each segment of the project as determined by the Engineer shall be given to the Engineer.

3.3 FURNISH AND INSTALL AND MAINTAIN TRAFFIC CONTROL, COMPLETE IN PLACE
(BID ITEM 3)

- A. The Traffic Control Plan (TCP) shall be measured by month.
- B. Payment includes preparation of a formal TCP by a Texas licensed professional engineer; submitting and obtaining approval of the formal TCP from the required governing agencies; furnishing, installing, and maintaining the approved TCP Plan complete for the duration of the project; implementing and maintaining the TCP in conformance to the specifications and principles given in the "Texas Manual on Uniform Traffic Control Devices" over the entire project area; and all other incidentals required for Contractor to complete, implement, and maintain the TCP requirements. Conflicting pavement markings/signs must be removed/covered for long-term projects. Work-zone markings must be installed where needed. Original markings/signs that are removed must be replaced upon completion. This cost shall be included as part of TCP. All costs for this work shall be included in the Contractor's monthly price and shall be complete compensation for performance of this work.

3.4 FURNISH AND INSTALL AND MAINTAIN SWPPP, COMPLETE IN PLACE (BID ITEM 4)

- A. Measurement for furnishing, installing and maintaining storm water pollution prevention plan shall be on a lump sum basis.
- B. Payment includes furnishing, installing and removing silt fencing; construction entrances/exits; erosion control measures; haul roads; equipment and supply areas; removal of litter; repair to devices and features damaged by the Contractor; added measures and maintenance needed due to negligence, carelessness, lack of maintenance, and failure to install permanent controls; removal and reinstallation of devices and features needed for the convenience of the Contractor; finish grading and dressing upon removal of the device; minor adjustments including but not limited to plumbing posts, reattaching fabric, minor grading to maintain slopes on an erosion embankment feature; moving sandbags; abiding by TPDES requirements; submittal of TPDES forms and associated fees; equipment, labor, tools, and incidentals. Contractor shall be responsible for the repair of damages or distress to adjacent properties, structures, and utilities caused by these operations. All costs for this work shall be compensated under this pay item.

3.5 REMOVAL AND PROPER DISPOSAL OF EXISTING CTB (BID ITEM 5)

- A. Measurement for removal and proper disposal of existing concrete traffic barrier (CTB) shall be linear feet.

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- B. Payment includes removal and proper disposal of existing concrete traffic barrier (CTB); excavation, bolts, nuts, screws, hinges, steel ties, labor, tools, equipment, and incidentals. Contractor shall be responsible for the repair of damages or distress to adjacent properties, structures, utilities caused by these operations. All costs for this work shall be compensated under this pay item.

3.6 REMOVAL AND PROPER DISPOSAL OF EXISTING BARRICADES (BID ITEM 6)

- A. Measurement for removal and proper disposal of existing barricades shall be each.
- B. Payment includes removal and proper disposal of existing barricades; post, base post, signs, slip base, concrete footing, concrete reinforcement, bolts, nuts, screws, hinges, steel ties, labor, tools, equipment, and incidentals. Contractor shall be responsible for the repair of damages or distress to adjacent properties, structures, utilities caused by these operations. All costs for this work shall be compensated under this pay item.

3.7 REMOVAL AND PROPER DISPOSAL OF EXISTING WOODEN POST (BID ITEM 7)

- A. Measurement for removal and proper disposal of existing wooden post shall be each.
- B. Payment includes removal and proper disposal of existing wooden post, base post, concrete footing, concrete reinforcement, bolts, nuts, screws, hinges, steel ties, labor, tools, equipment, and incidentals. Contractor shall be responsible for the repair of damages or distress to adjacent properties, structures, utilities caused by these operations. All costs for this work shall be compensated under this pay item.

3.8 REMOVAL AND PROPER DISPOSAL OF EXISTING METAL BEAM GUARDRAIL FENCE AND WOODEN POSTS (BID ITEM 8)

- A. Measurement for removal and proper disposal of existing metal beam guardrail fence and wooden posts shall be linear feet.
- B. Payment includes removal and proper disposal of existing metal beam guardrail fence; wooden posts, base post, concrete footing, concrete reinforcement, bolts, nuts, screws, hinges, steel ties, labor, tools, equipment, and incidentals. Contractor shall be responsible for the repair of damages or distress to adjacent properties, structures, utilities caused by these operations. All costs for this work shall be compensated under this pay item.

3.9 REMOVAL AND PROPER DISPOSAL OF EXISTING SIDEWALKS (BID ITEM 9)

- A. Measurement for removal and proper disposal of existing sidewalks shall be square yard.
- B. Payment includes removal and proper disposal of existing sidewalks; concrete reinforcement, joints, labor, tools, equipment, and incidentals. Contractor shall be responsible for the repair of damages or distress to adjacent properties, structures, utilities caused by these operations. All costs for this work shall be compensated under this pay item.

3.10 REMOVAL AND PROPER DISPOSAL OF EXISTING CURB AND GUTTER (BID ITEM 10)

- A. Measurement for removal and proper disposal of existing curb and gutter shall be linear feet.

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- B. Payment includes removal and proper disposal of existing curb and gutter; concrete reinforcement, joints, labor, tools, equipment, and incidentals. Contractor shall be responsible for the repair of damages or distress to adjacent properties, structures, utilities caused by these operations. All costs for this work shall be compensated under this pay item.

3.11 EXCAVATION OF CHANNEL, UNCLASSIFIED MATERIAL (BID ITEM 11)

- A. Excavation for channel, unclassified material will be measured by the cubic yard in its original position as computed by the method of average end areas. Measurements shall be taken to the neat lines, grades and typical sections as shown on the plans and cross-sections. Shrinkage or swell factors will not be considered in determining the calculated quantities.
- B. Payment for channel excavation, unclassified material shall include: excavation of areas as shown on the plans or as directed, removal and disposal of excavated spoil materials, testing, equipment, materials, labor, tools, temporary excavation support systems, shoring, bracing and incidentals. Materials being excavated are unclassified. Materials shall be considered unclassified throughout the entire project limits. Removal and proper disposal of unclassified materials encountered during excavation such as lumped soil, boulders, rock, andesite rock, debris, and concrete of any type and size will not be paid directly but will be subsidiary to this item. Contractor shall be responsible for the repair of damages or distress to adjacent properties, structures and utilities caused by these operations. All costs for this work shall be compensated under this pay item.

3.12 FURNISH AND INSTALL SELECT FILLS FOR EMBANKMENT OF CHANNEL, COMPLETE IN PLACE (BID ITEM 12)

- A. Measurement shall be the actual amount of select fill in cubic yards and placement for embankment of channel, and all other project improvements. Select fill requirements per Section 31 23 23. Preparation of subgrade materials to accept select fill placement is subsidiary to this item.
- B. Payment for furnishing and installing select fills for embankment of channel shall include: furnishing embankment, hauling, placing, compacting, finishing and reworking, disposal of waste material, correction of soft spots in the subgrade, testing, equipment, labor, tools, and incidentals. All sprinkling, rolling and proof rolling will not be paid for directly but will be considered subsidiary to this item. Contractor shall be responsible for the repair of damages or distress to adjacent properties, structures and utilities caused by these operations. All costs for this work shall be compensated under this pay item.

3.13 FURNISH AND INSTALL LOOSE RIP RAP TO FILL SOIL STABILIZATION SYSTEM (2" NOMIAL), COMPLETE IN PLACE (BID ITEM 13)

- A. Measurement for furnishing and installing loose rock rip-rap to fill soil stabilization system shall be paid by square yard.
- B. Payment for furnishing and installing loose rock rip-rap to fill soil stabilization system shall include: angular rock, hauling, transporting, placing, finishing, subgrade preparation, excavation, removal and disposal of excavated spoil materials, disposal of excavated material, forms, equipment, labor, tools, and incidentals. Contractor shall be responsible for the repair or damages or distress to adjacent properties, structures, and utilities caused by these operations. All cost for this work shall be compensated under this pay item.

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- 3.14 FURNISH AND INSTALL GABION ROCK MATTRESS, COMPLETE IN PLACE
(BID ITEM 14)
- A. Measurement for furnishing and installing gabion rock mattress shall be by square yards.
 - B. Payment for furnishing and installing gabion rock mattress includes gabion mattress, specified mesh, specified rock, fasteners, accessories, geotextile, rock placement, excavation, subgrade preparation, disposal of excavated material, forms, false work, equipment, labor, tools, and incidentals. Contractor shall be responsible for the repair of damages or distress to adjacent properties, structures, and utilities caused by these operations. All costs for this work shall be compensated under this pay item.
- 3.15 FURNISH AND INSTALL GABION WEIR STRUCTURES, COMLETE IN PLACE
(BID ITEM 15)
- A. Measurement for furnishing and installing gabion weir structures shall be by cubic yards.
 - B. Payment for furnishing and installing gabion weir structures includes gabion baskets, specified mesh, specified rock, fasteners, accessories, geotextile, rock placement, excavation, subgrade preparation, disposal of excavated material, forms, false work, equipment, labor, tools, and incidentals. Contractor shall be responsible for the repair of damages or distress to adjacent properties, structures, and utilities caused by these operations. All costs for this work shall be compensated under this pay item.
- 3.16 FURNISH AND INSTALL MORTAR ROCK RIP RAP, COMPLETE IN PLACE (BID ITEM 16)
- A. Measurement for furnishing and installing mortar rock rip rap shall be by square yards.
 - B. Payment for furnishing and installing mortar rock rip-rap shall include: angular rock, mortar, hauling, transporting, placing, finishing, subgrade preparation, excavation, removal and disposal of excavated spoil materials, disposal of excavated material, forms, equipment, labor, tools, and incidentals. Contractor shall be responsible for the repair or damages or distress to adjacent properties, structures, and utilities caused by these operations. All cost for this work shall be compensated under this pay item.
- 3.17 FURNISH AND INSTALL ARTICULATED BLOCK CONCRETE, COMPLETE IN PLACE
(BID ITEM 17)
- A. Measurement for furnishing and installing articulated block concrete shall be by square yards.
 - B. Payment for furnishing and installing articulated block concrete shall include: hauling, transporting, placing, finishing, subgrade preparation, excavation, removal and disposal of excavated spoil materials, disposal of excavated material, forms, equipment, labor, tools, and incidentals. Contractor shall be responsible for the repair or damages or distress to adjacent properties, structures, and utilities caused by these operations. All cost for this work shall be compensated under this pay item.
- 3.18 FURNISH AND INSTALL SWING ACCESS GATE, COMPLETE IN PLACE (BID ITEM 18)
- A. Measurement for furnishing and installing swing access gates shall be by each.

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- B. Payment for furnishing and installing swing access gates shall include: footings, hauling, transporting, placing, finishing, subgrade preparation, excavation, removal and disposal of excavated spoil materials, disposal of excavated material, forms, equipment, labor, tools, and incidentals. Contractor shall be responsible for the repair or damages or distress to adjacent properties, structures, and utilities caused by these operations. All cost for this work shall be compensated under this pay item.
- 3.19 FURNISH AND INSTALL CONCRETE DRIVEWAY, COMPLETE IN PLACE (BID ITEM 19)
- A. Measurement for furnishing and installing concrete driveway shall be by square yards.
- B. Payment for furnishing and installing concrete driveways includes concrete, reinforcement, equipment, excavation, removal and disposal of excavated spoil materials and embankment, base and pavement materials, labor, materials, tools, testing, and preparation of subgrade materials. Contractor shall be responsible for the repair of damages or distress to adjacent properties, structures, and utilities caused by these operations. All costs for this work shall be compensated under this pay item.
- 3.20 FURNISH AND INSTALL WROUGHT IRON FENCE, COMPLETE IN PLACE (BID ITEM 20)
- A. Measurement for furnishing and installing wrought iron fence shall be by linear foot.
- B. Payment for furnishing and installing wrought iron fence includes concrete footing, reinforcement, equipment, excavation, removal and disposal of excavated spoil materials and embankment, base and pavement materials, welding, ornaments, paint, finishes, labor, materials, tools, testing, and preparation of subgrade materials. Contractor shall be responsible for the repair of damages or distress to adjacent properties, structures, and utilities caused by these operations. All costs for this work shall be compensated under this pay item.
- 3.21 FURNISH AND INSTALL ASPHALT PAVEMENT, COMPLETE IN PLACE (BID ITEM 21)
- A. Measurement for furnishing and installing asphalt pavement shall be by square yards.
- B. Payment for furnishing and installing asphalt pavement includes, equipment, excavation, compaction and rolling of base and pavement materials, labor, materials, tools, testing, and preparation of subgrade materials. Contractor shall be responsible for the repair of damages or distress to adjacent properties, structures, and utilities caused by these operations. All costs for this work shall be compensated under this pay item.
- 3.22 FURNISH AND INSTALL SOIL STABILIZATION SYSTEM, COMPLETE IN PLACE (BID ITEM 22)
- A. Measurement for furnishing and installing soil stabilization system shall be by square yards.
- B. Payment for furnishing and installing soil stabilization system includes geocell, specified mesh, fasteners, anchors, accessories, geotextile, excavation, subgrade preparation, disposal of excavated material, forms, false work, equipment, labor, tools, and incidentals. Contractor shall be responsible for the repair of damages or distress to adjacent properties, structures, and utilities caused by these operations. All costs for this work shall be compensated under this pay item.

3.23 ALLOWANCE FOR ADDITIONAL WORK DEEMED NECESSARY BY OWNER TO COMPLETE PROJECT (BID ITEM 23)

- A. Allowance in the amount of \$400,00 will be allocated for any unforeseen costs and work associated with the installation of any new items and/or the installation of any of the aforementioned items listed in the measurement and payment and as specified by engineer's construction plans.
- B. This allowance shall only be used with approval from Owner. Measurement and payment for this item shall be not to exceed \$400,000. Contractor shall be responsible for submitting cost breakdowns for additional work.

3.24 UNIT PRICE BID

- A. Total compensation for required Unit or Lump Sum Price shall be included in the Contractor's Bid Price for the Work.

3.25 STORED MATERIALS

- A. Interim payments for stored materials will be made only for materials to be incorporated into the work that are properly stored acceptable to the Engineer. Payment will be made at 95 percent of invoice price.

3.26 PROGRESS PAYMENTS

- A. The Contractor shall submit his schedule of values for breakdown of the lump sum bid price to the Engineer for approval prior to the first application of payment.
- B. Progress payments will be based on the Engineer's observations and evaluations of quantities incorporated in the Work multiplied by the unit price.

3.27 FINAL PAYMENT

- A. Final payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities determined by the Engineer multiplied by the unit price for Work which is incorporated in or made necessary by the Work.

3.28 PAYMENT

- A. Payment will be made for all work covered in this section at the contract unit price per unit or will be included in the lump sum price per job for items, as shown on the proposal for quantities of work constructed, authorized and accepted. Such payment shall be complete compensation for the complete performance of the work in accordance with the drawings and the provisions of these specifications.

END OF SECTION

SECTION 01 25 00 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Quality assurance.
 - 2. Product options.
 - 3. Product substitution procedures.
- B. Related Requirements:
 - 1. Other Division 01 Specification Sections apply to Work of this Section.

1.2 QUALITY ASSURANCE

- A. Contract is based on products and standards established in Contract Documents without consideration of proposed substitutions.
- B. Products specified define standard of quality, type, function, dimension, appearance, and performance required.
- C. Substitution Proposals: Permitted for specified products except where specified otherwise. Do not substitute products unless Owner accepts substitution and approves in writing.

1.3 PRODUCT OPTIONS

- A. See Section 01 60 00 "Product Requirements."

1.4 PRODUCT SUBSTITUTION PROCEDURES

- A. Engineer will consider requests for substitutions only within 30 days after date established in Notice to Proceed.
- B. Substitutions may be considered when product becomes unavailable through no fault of Contractor.
- C. Document each request with complete data, substantiating compliance of proposed substitution with Contract Documents, including:
 - 1. Manufacturer name and address, product, trade name, model, or catalog number, performance and test data, and reference standards.
 - 2. Itemized point-by-point comparison of proposed substitution with specified product, listing variations in quality, performance, and other pertinent characteristics.
 - 3. Reference to Article numbers in Specifications.
 - 4. Cost data comparing proposed substitution with specified product and amount of net change to Contract Sum.
 - 5. Changes required in other Work.
 - 6. Availability of maintenance service and source of replacement parts, as applicable.
 - 7. Certified test data to show compliance with performance characteristics specified.
 - 8. Samples when applicable or requested.
 - 9. Other information as necessary to assist Engineer's evaluation.

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- D. A request constitutes a representation that Contractor:
1. Investigated proposed product and determined it meets/exceeds quality level of specified product.
 2. Will provide same warranty for substitution as specified product.
 3. Will coordinate installation and make changes to other Work required for Work to complete with no additional cost to Owner.
 4. Waives claims for additional costs/time extension that subsequently become apparent.
 5. Will coordinate installation of accepted substitute, making required changes for Work to complete in all respects.
 6. Will reimburse Owner for review/redesign services associated with reapproval by authorities having jurisdiction.
- E. Substitutions not considered when indicated/implied on Shop Drawing or Product Data submittals without separate written request or acceptance requires revision to Contract Documents.
- F. Substitution Submittal Procedure:
1. Submit requests for substitutions on Contractor-standard or Engineer-provided form.
 2. Submit electronic files to Project website of Request for Substitution for consideration. Limit each request to one proposed substitution.
 3. Submit Shop Drawings, Product Data, and certified test results attesting to proposed product equivalence. Burden of proof is on Contractor.
 4. Engineer will notify Contractor in writing of decision to accept/reject request.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 30 00 – ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes coordination, field engineering, preconstruction conference, progress meetings, and coordination with utilities.
- B. Related Requirements:
 - 1. Division 01 Specifications Sections apply to Work of this Section.

1.2 COORDINATION

- A. Coordinate scheduling, submittals, and Work of various specifications sections to assure efficient and orderly sequence of installation of interdependent construction elements with provisions for accommodating items installed later.
- B. Verify utility requirement characteristics of equipment and materials incorporated into project are compatible. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment and materials.
- C. Coordinate completion and clean-up of Work.

1.3 PRECONSTRUCTION CONFERENCE

- A. Engineer will schedule a conference after Notice to Proceed.
- B. Attendance Required: Owner, Engineer, Contractor, and major subcontractors.
- C. Agenda:
 - 1. Execution of Owner-Contractor Agreement.
 - 2. Submission of executed bonds and insurance certificates.
 - 3. Distribution of Contract Documents.
 - 4. Davis Bacon requirements.
 - 5. Submit list of subcontractors and products, Schedule of Values, and progress schedule.
 - 6. Designation of personnel representing parties in Contract and Engineer.
 - 7. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
 - 8. Scheduling.
 - 9. Use of premises by Owner and Contractor.
 - 10. Owner requirements.
 - 11. Survey layout.
 - 12. Security and housekeeping procedures.
 - 13. Schedules.
 - 14. Procedures for testing.
 - 15. Procedures for maintaining record documents.
 - 16. Requirements for start-up of equipment.
 - 17. Inspection and acceptance of equipment put into service during construction period.

1.4 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of Work at maximum monthly intervals.
- B. Monthly progress meetings will be held onsite at job trailer.

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- C. Contractor plans for meetings, prepares agenda with copies for participants, presides at meetings, records minutes, and distributes copies within one week to Engineer, participants, and those affected by decisions made.
 - D. Attendance Required: Job superintendent, major subcontractors, suppliers, Engineer, as appropriate to agenda topics for each meeting.
 - E. Agenda:
 - 1. Review minutes of previous meetings.
 - 2. Review of Work progress.
 - 3. Field observations, problems, and decisions.
 - 4. Identification of problems which impede planned progress.
 - 5. Review of submittals schedule and status of submittals.
 - 6. Review of off-site fabrication and delivery schedules.
 - 7. Maintenance of progress schedule.
 - 8. Corrective measures to regain projected schedules.
 - 9. Planned progress during succeeding work period.
 - 10. Coordination of projected progress.
 - 11. Maintenance of quality and work standards.
 - 12. Effect of proposed changes on progress schedule and coordination.
 - 13. Other business relating to Work.

1.5 COORDINATION WITH OWNERS OF EXISTING UTILITIES

- A. Contractor is responsible for notifying all owners of utilities to cross or otherwise exposed during construction no less than seven days prior to uncovering utility.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify existing site conditions and substrate surfaces are acceptable for subsequent work. Beginning new work means acceptance of existing conditions.

3.2 GENERAL COORDINATION

- A. Contractor responsible for ascertaining nature and extent of collateral work done by others. Contractor shall include in his bid all costs associated with coordinating with others. Contractor not entitled to additional compensation resulting from coordination of this work with simultaneous or collateral work on other projects. If necessary to avoid or minimize damage or delay, Contractor shall redeploy his work force to other areas of the work, at no cost to Owner.

3.3 COORDINATION WITH OWNER

- A. All coordination between Contractor and Owner shall be through Engineer. Contractor work shall not interfere with continual use of existing facilities. Contractor shall be responsible for coordinating all work. Contractor shall give a **72-hour** notice to Engineer prior to starting any work at tie-in locations.

3.4 COORDINATION WITH PROPERTY OWNERS

- A. Contractor is responsible for notification of property owners, businesses, and residents along pipeline route to explain construction to them, 72 hours in advance of construction. Contractor responsible for providing access to businesses, schools, and residences for all property owners, customers, and residents at all times. Any resident unable to park vehicles at residence due to construction shall be provided with secure place to park as near to residence as possible by Contractor at no cost to Owner.

3.5 COORDINATION WITH POLICE, FIRE, AND EMS

- A. Contractor responsible for coordination with school district buses, police, fire, and EMS agencies. This coordination includes notification at least one week in advance of work-affected traffic flow through area. This requires coordination with the development and implementation of traffic control plan.

3.6 COORDINATION WITH VARIOUS AGENCIES AND DEPARTMENTS

- A. Contractor is responsible for coordination with Owner, the City of El Paso, or any other utilities/agencies involved. Contractor shall notify the City of El Paso for coordination of backfill, paving operations, etc. for work within City of El Paso rights-of-way.

END OF SECTION

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes submittal procedures and construction progress schedules.
- B. Related Requirements:
 - 1. Other Division 01 Specification Sections apply to Work of this Section.

1.2 SUBMITTAL PROCEDURES

- A. Submit to Engineer and Owner for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.
- B. Produce copies, distribute, and record documents purposes described per Section 01 33 00 "Submittal Procedures."
- C. Transmit each submittal with Contractor's standard transmittal letter including Contractor's name, address, and phone number.
- D. Sequentially number transmittal forms using Section number or Contractor other sequential numbering system.
- E. Identify Project, Contractor, subcontractor, or supplier; pertinent drawing sheet and detail number(s), and specification Section number, appropriate to submittal.
- F. Apply Contractor's stamp, signed or initialed certifying review, verification of products required, field dimensions, adjacent construction Work, and coordination of information, is in accordance with requirements of Work and Contract Documents.
- G. Schedule submittals to expedite Project and deliver to Engineer at business address. Coordinate submission of related items.
- H. For each submittal for review, allow 15 days excluding delivery time to and from Contractor.
- I. Identify variations from Contract Documents and product or system limitations which may be detrimental to successful performance of completed Work.
- J. Allow space on submittals for Contractor, Engineer, and Engineer review stamps.
- K. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.
- L. Submittals not requested will not be recognized or processed.
- M. Format:
 - 1. Submit all submittals digitally using PDF file extension. Each submittal shall be a single PDF file including transmittal letter. Multiple files for same submittal not accepted.
 - 2. Submittals in any other format, including ZIP files, will be rejected.
 - 3. Hard copies will not be accepted.
 - 4. To ensure each page is legible, PDF pages of drawings shall be same size/scale as hard copy. Where applicable, scale symbols provided to indicate scale. Illegible submittals will be rejected.
 - 5. Submittals will be uploaded to Engineers Info Exchange Website.
- N. At Engineer's option, submittals will not be individually marked, but reviewed using Engineer's standard submittal review form.
- O. Copies Required: Number Contractor requires plus three copies retained by Engineer.

1.3 RESUBMITTAL REQUIREMENTS

- A. Revise and resubmit submittals, as required, and resubmit complete submittal package per original to meet requirements as specified and as noted on submittal reviews.
- B. Mark as *Resubmittal*.
- C. Reuse original transmittal number and supplement with sequential alphabetical or numeric suffix for each resubmittal.

1.4 CONSTRUCTION PROGRESS SCHEDULES

- A. Submit initial progress schedule in duplicate for Engineer's review within 15 days after date established in Notice to Proceed.
- B. Revise and resubmit as required.
- C. Submit revised schedules with each Application for Payment, identifying changes since previous version.
- D. Submit a horizontal bar chart with separate line for each section of Work, identifying first workday of each week.
- E. Indicate estimated percentage of completion for each item of Work at each submission.
- F. Revisions to Schedules:
 - 1. Indicate progress of each activity to date of submittal, and projected completion date of each activity.
 - 2. Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.
 - 3. Prepare narrative report to define problem areas, anticipated delays, and impact on Schedule. Report corrective action taken, or proposed, and effect including effect of changes on schedules of separate Contractors.

PART 2 - PRODUCT (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Quality control.
 - 2. Tolerances.
 - 3. References.
 - 4. Mockup requirements.
 - 5. Testing and inspection services.
 - 6. Manufacturers' field services.
- B. Related Sections:
 - 1. Other Division 01 Specification Sections apply to Work of this Section.

1.2 QUALITY CONTROL

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturer's instructions. If manufacturer's instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- C. Perform Work using persons qualified to produce required and specified quality.
- D. Products, materials, and equipment may be subject to inspection by Engineer at place of manufacture or fabrication. Such inspections shall not relieve Contractor of complying with requirements of Contract Documents.
- E. Supervise performance of Work to ensure Work, whether completed or in progress, will not be subjected to harmful, dangerous, damaging, or otherwise deleterious exposure during construction.

1.3 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' recommended tolerances and tolerance requirements in reference standards. When tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

1.4 REFERENCES

- A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of standard except when more rigid requirements are specified or required by applicable codes.
- B. Conform to reference standard by date of issue current as of date of Contract Documents except where specific date is established by code.
- C. Obtain copies of standards and maintain onsite when required by product Specifications.
- D. When requirements of indicated reference standards conflict with Contract Documents, request clarification from Engineer before proceeding.

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- E. Neither contractual relationships, duties, or responsibilities of parties in Contract, nor those of Engineer shall be altered from Contract Documents by mention or inference in reference documents.

1.5 TESTING AND INSPECTION SERVICES

- A. Employ and pay for services of an independent firm acceptable to Owner to perform specified testing.
 - 1. Before starting Work, submit testing firm name, address, phone number, and name of responsible officer.
- B. Independent firm will perform tests, inspections, and other services specified in individual Specifications and as required by Engineer.
- C. Testing, inspections, and source quality control may occur on or off Project site. Perform off-site testing as required by Engineer.
- D. Submit reports to Engineer, indicating observations and results of tests and compliance or noncompliance with Contract Documents.
- E. Cooperate with independent firm. Furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor, as requested.
 - 1. Notify Engineer and independent firm 24 hours before expected time for operations requiring services.
 - 2. Pay for additional Samples and tests required for Contractor use.
- F. Employment of testing agency or laboratory shall not relieve Contractor of obligation to perform Work per requirements of Contract Documents.
- G. Retesting or Re-inspection Required Because of Nonconformance with Specified or Indicated Requirements: Payment for retesting or re-inspection will be charged to Contractor by deducting testing charges from Contract Sum/Price.
- H. Independent Firm Responsibilities:
 - 1. Test Samples of mixes submitted by Contractor.
 - 2. Provide qualified personnel at Site. Cooperate with Engineer and Contractor in performance of services.
 - 3. Perform indicated sampling and testing of products per specified standards.
 - 4. Ascertain compliance of materials and mixes with Contract Document requirements.
 - 5. Promptly notify Engineer and Contractor of observed irregularities or nonconformance of Work or products.
 - 6. Perform additional tests required by Engineer.
 - 7. Attend preconstruction and progress meetings.
- I. Independent Firm Reports. After each test, promptly submit report to Engineer and Contractor and provide interpretation of test results. Include:
 - 1. Date issued.
 - 2. Project title and number.
 - 3. Name of inspector.
 - 4. Date and time of sampling or inspection.
 - 5. Identification of product and Specifications.
 - 6. Location in Project.
 - 7. Type of inspection or test.
 - 8. Date of test.
 - 9. Results of tests.
 - 10. Conformance with Contract Documents.

1.6 MANUFACTURER'S FIELD SERVICES

- A. When specified in individual Specifications, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, equipment startup, testing, adjusting, and balancing equipment, commissioning, and other as applicable, and initiate instructions when necessary.
- B. Submit qualifications of observer to Engineer 30 days before required observations. Observer is subject to Engineer approval.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturer's written instructions.
- D. Refer to Section 01 33 00 "Submittal Procedures," Article 1.11 - Manufacturer's Field Reports.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 43 26 - TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Testing Laboratory Services and Contractor responsibilities related to those services. Where tests of materials or any portions of Work are required by law/ordinance or public authority, Contractor shall bear all costs of such tests, shall give timely notice of readiness thereof and shall furnish to Engineer required certification of testing or approval. Tests specified in Technical Specifications shall fall into four categories:
 - a. Those required for approval of materials prior to use, which serve the same purpose as shop drawings or samples.
 - b. Those required by law.
 - c. Those necessary for acceptance of equipment, and/or facilities.
 - d. Those made during progress of Work to check compliance with requirements of Contract Documents.
2. Contractor shall bear all costs of tests in first three categories.
3. Tests made in the fourth category will be made at Engineer's discretion and all costs thereof borne by Owner, except Contractor shall furnish materials for sample and cooperate with Engineer, or Testing Laboratory, in securing such samples. In addition, all failing tests in this category is borne by Contractor.
4. Tests in fourth category include tests normally performed by commercial testing laboratory for materials such as density tests for pipe bedding, trench and/or structural backfill, sub-grade, base course, and hot mix, proctor tests and Atterberg Limits for pipe bedding, trench and/or structural backfill, subgrade and base course, in place densities for Asphalt pavement, including Marshall stability, Asphalt extraction and gradation tests, cylinders for concrete compressive strength, mortar cubes and prisms for grout strength.

B. Related Requirements:

1. Other Division 01 Specifications Sections apply to Work of this Section.

1.2 REFERENCES

- A. ASTM D3740 - Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
- B. ASTM E329 - Recommended Practice for Inspection and Testing Agencies for Concrete, Steel and Bituminous Materials as Used in Construction.

1.3 SELECTION AND PAYMENT

- A. Owner reserves the right to employ and pay for services of independent testing laboratory to perform inspection and testing identified in individual Specification Sections.
- B. Employment of testing laboratory shall not relieve Contractor of obligation to perform work per Contract Documents.
- C. Contractor shall schedule and monitor testing as required to provide timely results and avoid delay to Work.

1.4 LABORATORY REPORTS

- A. Engineer will receive three and Contractor will receive two copies of laboratory reports from testing laboratory. One of Contractor's copies shall remain at site field office for duration of Project. Test results indicating nonconformance shall be transmitted immediately via fax from testing laboratory to Contractor and Engineer.

1.5 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter or enlarge requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of Work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop Work.

1.6 CONTRACTOR RESPONSIBILITIES

- A. Contractor shall notify Engineer and laboratory 24 hours prior to expected time for operations requiring inspection and testing services. Contractor shall notify Engineer if Specification Section requires Engineer's presence.
- B. Contractor shall cooperate with laboratory personnel in collecting samples to test or collect onsite.
- C. Contractor shall provide access to Work and manufacturer's facilities.
- D. Contractor shall provide samples to laboratory in advance of intended use to allow thorough examination and testing.
- E. Contractor shall provide incidental labor and facilities for access to Work to test; obtain and handle samples at site or source of products to test; and facilitate tests and inspections including storage and curing of test samples.
- F. Contractor shall arrange with laboratory and pay for:
 - 1. Retesting required for failed tests.
 - 2. Retesting for nonconforming Work.
 - 3. Additional sampling and tests requested by Contractor beyond specified requirements.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 CONDUCTING TESTING

- A. Laboratory sampling and testing shall conform to ASTM D3740 and ASTM E329, plus other test standards specified in individual Specification Sections.

3.2 PAYMENT

- A. Payment made for all work covered in this Section at Contract unit price per unit or included in lump sum price per job for items shown in proposal. Either payment shall be complete compensation for complete performance of Work per Drawings and Specification provisions.

END OF SECTION

SECTION 01 50 00 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Temporary Utilities: Electricity, lighting, ventilation, water, and sanitary facilities.
 - 2. Temporary Controls: Barriers, fencing, protection of the Work, and water control.
 - 3. Construction Facilities: Access roads, parking, progress cleaning, and project signage.
- B. Related Requirements:
 - 1. Other Division 01 Specification Sections apply to Work of this Section.

1.2 TEMPORARY ELECTRICITY

- A. Provide temporary electric service as required.

1.3 TEMPORARY WATER SERVICE

- A. Contractor is responsible for providing all water required for construction of Project.
- B. Water used for construction purposes may be obtained from existing mains and fire hydrants as directed by Owner; however, Contractor shall make his own arrangements for connections to mains and fire hydrants and furnish all piping, fire hoses, or hauling water to where water is required, at his own expense.
- C. Contractor shall secure permission from City Water Superintendent before connecting to any fire hydrant or main to obtain water for construction purposes. An inspection shall be made at end of construction and any damage caused to fire hydrants or pavement, shall be repaired at Contractor's cost to satisfaction of Owner.
- D. Contractor is responsible for applying for construction water meter.

1.4 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures.
- B. Permanent building facilities not used during construction operations. Maintain daily in clean and sanitary condition.

1.5 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas to allow for Owner's use of site and protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.6 WATER CONTROL

- A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

1.7 PROTECTION OF INSTALLED WORK

- A. Protect installed Work and provide special protection where specified in individual Specification Sections.
- B. Provide temporary and removable protection for installed products. Control activity in immediate work area to minimize damage.
- C. Prohibit traffic from landscaped areas.

1.8 SECURITY

- A. Provide security and facilities to protect Work from unauthorized entry, vandalism, or theft.

1.9 ACCESS ROADS

- A. Construct and maintain temporary roads accessing public thoroughfares to serve the construction area.
- B. Extend and relocate as Work progress requires. Provide detours necessary for unimpeded traffic flow.
- C. Designated existing onsite roads may be used for construction traffic.

1.10 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain a clean and orderly site.
- B. Lawfully remove waste materials, debris, and rubbish from site and dispose off-site at intervals as required to maintain clean site.

1.11 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary above grade or buried utilities, equipment, facilities and materials as soon as permanent facilities can be utilized.
- B. Remove underground installations to minimum 2 feet. Grade site to preconstruction conditions.
- C. Clean and repair damage caused by installation or use of temporary work.
- D. Restore existing facilities used during construction to their original condition. Restore permanent facilities used during construction to specified condition.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 57 13 - EROSION AND SEDIMENT CONTROL DURING CONSTRUCTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes obtaining permits and furnish labor, materials, equipment, and incidentals necessary to provide erosion and sediment control during construction including furnishing, installing, and maintaining erosion and sediment control structures and procedures and proper removal when no longer required.
- B. Related Requirements:
 - 1. Other Division 01 Specification Sections apply to Work of this Section.

1.2 SUBMITTALS

- A. Submittals shall be per Section 01 33 00 "Submittals" and include copies of approved permits.

1.3 NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT

- A. A Stormwater Pollution Prevention Plan (SWPPP) is not required for this Project. Stormwater siltation and control devices shall conform to TCEQ Construction Stormwater General Permit TXR 150000 and EPA NPDES. Contractor shall prepare SWPPP plan, **if necessary**, for Project and copy Engineer with SWPPP, Notice of Intent (NOI), and NOT as applicable. Include cost of Plan and implementation in most appropriate bid item.
 - 1. One acre or less of disturbed area and not part of a larger common plan: Coverage under General Permit (TXR150000) not required.
 - 2. Five acres or more disturbed area:
 - a. Review facility compliance history ranking:
 - 1) If facility is new or has a ranking of "high" or "average," continue to Step b;
 - 2) If "poor," facility is not eligible for coverage under a general permit. Contactor shall apply for individual permit.
 - b. Read general permit (TXR150000) to make sure it is applicable to Project;
 - c. Prepare and implement SWPPP. For more details, refer to Part III of General Permit TXR150000.
 - d. Submit an original completed NOI form with an original signature and fee as noted on NOI. Three options are available:
 - 1) Submit NOI and fee payment electronically through STEERS;
 - 2) Submit NOI on paper and fee payment online via ePay;
 - 3) Submit NOI on paper and fee payment by check.
 - e. Prior to starting construction, copies of NOI and Site Notice shall be posted at construction site. Leave notices posted until construction is completed.
 - 3. Five acres and less of disturbed area (but at least one acre):
 - a. If construction is to take place in a particular county during a particular time period when erosion is expected to be minimal (refer to Appendix A of TXR150000), Contractor may be eligible for regulation under Low Potential for Erosion Requirements.
 - b. If potential for soil to wash away during your construction activity is low, Contractor may qualify for Low Rainfall Erosivity Waiver.
 - c. Even if Contactor is eligible for coverage under a general permit, Contactor may opt to request coverage under individual permit.

B. Provide dust control in accordance with SWPPP.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 57 25 - DUST CONTROL DURING CONSTRUCTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes furnishing labor, material, equipment, and incidentals necessary to control all windborne dust created by construction activities. Contractor will be responsible to maintain all dust control procedures and control structures until Project is complete and accepted by Owner.
- B. Related Requirements:
 - 1. Other Division 01 Specification Sections apply to Work of this Section.

1.2 JOB CONDITIONS: CODES AND ORDINANCES

- A. Comply with local codes and ordinances. If local codes and ordinances require more stringent or additional dust control measures during construction, Contractor shall provide such measures at no additional cost.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 DUST CONTROL

- A. Contractor will be required to implement and follow a dust control plan for all operations associated with the Project. These activities include, but are not limited to, excavation, hauling, stockpiling, rock crushing, and compaction activities. Contractor must provide the proposed Dust Control Plan for approval by Architect or Owner before the start of any mobilization and field activities.
- B. Note: Prior to and during any high wind event, control measures must continue to be implemented as necessary to effectively minimize windblown dust. The plan must address the following construction activities.
- C. Excavation and Earthmoving:
 - 1. Grading, Demolition, and Weed Control:
 - a. Conduct watering as necessary to prevent or minimize visible emissions.
 - b. Prewet site to depth of cut.
 - c. Increase watering frequency over construction site during high wind conditions until there is no evidence of windblown dust.
 - 2. Trenching, Backfilling, and Screening Operations:
 - a. Mist dust cloud from trench operations.
 - b. Mist material that drops through screen.
 - c. Keep a water truck or large water supply hose nearby to operations.
 - d. Increase watering frequency over construction site during high wind conditions until there is no evidence of windblown dust.

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- D. Site Stabilization/Disturbed Surface Area:
1. Temporary Stabilization:
 - a. Apply water to all areas at least twice daily until a crusted surface has formed.
 - b. Apply either emulsion or chemical stabilizers to area.
 - c. Install wind fences/barriers.
 2. For Areas Not Active for Periods of 15 Days:
 - a. Apply dust suppressants to all disturbed areas to maintain stabilization.
 - b. Apply water to all inactive disturbed areas at least twice daily until a crusted surface has formed.
 - c. Install temporary coverings/enclosures, if practical.
 3. Open Storage Piles:
 - a. Apply either emulsion or chemical stabilizers to area.
 - b. Apply water to surface area of all open storage piles on a daily basis.
 - c. Install temporary coverings/enclosures, if practical.
- E. Material Handling and Hauling:
1. Material Loading:
 - a. Prewet material prior to handling or loading.
 - b. Water/mist while loading to prevent or minimize visible emissions.
 2. Hauling: All haul trucks carrying bulk materials must be effectively covered with a tarp or suitable cover, or the load be stabilized in such a manner that dust does not become airborne in route.
- F. Roadways/Site Access Points:
1. Unpaved Haul/Access Roads/Equipment Paths:
 - a. Stabilize with gravel or crushed asphalt.
 - b. Apply emulsion or chemical dust suppressants to maintain surface stabilization.
 - c. Water all surfaces as needed to prevent or minimize visible dust emissions.
 - d. Restrict vehicle speed to 5 mph in addition to the above.
 2. Access Points:
 - a. Install a stabilized construction entrance/coarse gravel pad.
 - b. Install a wheel washer.
 - c. Limit, restrict, or reroute motor vehicle access.
 - d. Vacuum or wet broom daily all visible track-out.

END OF SECTION

SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Products.
 - 2. Product delivery requirements.
 - 3. Product storage and handling requirements.
- B. Related Sections:
 - 1. Other Division 01 Specification Sections apply to Work of this Section.

1.2 PRODUCTS

- A. At minimum, comply with specified requirements and reference standards.
- B. Specified products define standard of quality, type, function, dimension, appearance, and performance required.
- C. Furnish products of qualified manufacturers suitable for intended use. Furnish products of each type by single manufacturer unless specified otherwise. Confirm manufacturer's production capacity can provide sufficient product, on time, to meet Project requirements.

1.3 PRODUCT DELIVERY REQUIREMENTS

- A. Transport and handle products per manufacturer instructions.
- B. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.
- C. Provide equipment and personnel to handle products. Prevent soiling, disfigurement, or damage.
- D. Owner will not assist in offloading or accepting product deliveries.

1.4 PRODUCT STORAGE AND HANDLING REQUIREMENTS

- A. Store and protect products per manufacturer instructions.
- B. Store products with seals and labels intact and legible.
- C. Store sensitive products in weathertight, climate-controlled enclosures in an environment suitable to product.
- D. For exterior storage of fabricated products, place products on sloped supports above ground.
- E. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- F. Store loose granular materials on solid flat surfaces in well-drained area. Prevent mixing with foreign matter.
- G. Provide equipment and personnel to store products. Prevent soiling, disfigurement, or damage.
- H. Arrange product storage to permit access for inspection. Periodically inspect to verify products are undamaged and maintained in acceptable condition.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 70 00 - EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Surveying.
 - 2. Closeout procedures.
 - 3. Starting systems.
 - 4. Demonstration and instructions.
 - 5. Project record documents.
 - 6. Operation and maintenance data.
 - 7. Spare parts and maintenance products.
 - 8. Product warranties and product bonds.
 - 9. Examination.
 - 10. Preparation.
 - 11. Execution.
 - 12. Protecting installed construction.
 - 13. Final cleaning.
- B. Related Sections:
 - 1. Other Division 01 Specification Sections apply to Work of this Section.

1.2 SURVEYING

- A. Employ land surveyor registered in State of Texas and acceptable to Engineer.
- B. Locate and protect survey control and reference points. Promptly notify Engineer of discrepancies discovered.
- C. Control datum for survey is indicated on Drawings.
- D. Verify setbacks, easements, and rights of way. Confirm Drawing dimensions and elevations.
- E. Provide field engineering services. Establish elevations, lines, and levels using recognized engineering survey practices.
- F. Submit copy of Site Drawing signed by land surveyor certifying elevations and locations of Work are per Contract Documents.
- G. Maintain complete and accurate log of control and survey Work as Work progresses.
- H. Protect survey control points before starting Site Work. Preserve permanent reference points during construction.
- I. Promptly report to Engineer loss or destruction of reference point or relocation required because of changes in grades or other reasons.
- J. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to the Engineer.

1.3 CLOSEOUT PROCEDURES

- A. Prerequisites to Substantial Completion. Complete following items before requesting Certification of Substantial Completion, either for entire Work or portions of Work:
 - 1. Submit maintenance manuals, Project record documents, and other similar final record data per this Section.

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2. Complete facility startup, testing, adjusting, balancing systems and equipment, demonstrations, and instructions to Owner's operating and maintenance personnel as specified per this Section.
 3. Conduct inspection to establish basis for request that Work is substantially complete. Create comprehensive list (initial punch list) indicating items to complete or correct, value of incomplete or nonconforming Work, reason for incompleteness, and date of anticipated completion for each item. Include copy of list with request for Certificate of Substantial Completion.
 4. Obtain and submit releases enabling Owner's full, unrestricted use of Project and access to services and utilities. Include certificate of occupancy, operating certificates, and similar releases from authorities having jurisdiction and utility companies.
 5. Deliver tools, spare parts, extra stocks of material, and similar physical items to Owner.
 6. Change locks and transmit keys directly to Owner. Advise Owner's personnel of change-over in security provisions.
 7. Discontinue or change over and remove temporary facilities and services from Project Site, along with construction tools, mockups, and similar elements.
 8. Perform final cleaning per this Section.
- B. Substantial Completion Inspection:
1. When Contractor considers Work substantially complete, submit to Engineer and Owner:
 - a. Written certificate that Work, or designated portion, is substantially complete.
 - b. List of items to complete or correct (initial punch list).
 2. Within seven days after receipt of request for Substantial Completion, Engineer and Owner will inspect to determine if Work or designated portion is substantially complete.
 3. If Engineer and Owner determine Work is NOT substantially complete:
 - a. Engineer and Owner will promptly notify Contractor in writing, stating reasons for opinion.
 - b. Contractor shall remedy deficiencies in Work and send second written request for Substantial Completion to Engineer and Owner.
 - c. Engineer and Owner will reinspect Work.
 - d. Repeat until Work passes inspection.
 4. When Engineer and Owner finds Work is substantially complete, they will:
 - a. Prepare Certificate of Substantial Completion on EJCDC C-625 - Certificate of Substantial Completion, accompanied by Contractor's list of items to complete or correct as verified and amended by Engineer and Owner (final punch list).
 - b. Submit Certificate to Owner and Contractor for written acceptance of responsibilities assigned in Certificate.
 5. After Work is substantially complete, Contractor shall:
 - a. Allow Owner occupancy of Project under provisions stated in Certificate of Substantial Completion.
 - b. Complete Work listed for completion or correction within time stipulated.
- C. Prerequisites for Final Completion. Complete following items before requesting final acceptance and final payment.
1. When Contractor considers Work complete, submit written certification that:
 - a. Contract Documents were reviewed.

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- b. Work was examined for compliance with Contract Documents.
 - c. Work was completed per Contract Documents.
 - d. Work is complete and ready for final inspection.
2. Submit:
 - a. Final punch list indicating all items are complete or correct.
 - b. Final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations, where required.
 - c. Specified warranties, workmanship/maintenance bonds, maintenance agreements, and other similar documents.
 - d. Accounting statement for final changes to Contract Sum.
 - e. Contractor's affidavit of payment of debts and claims on Contractor's Affidavit of Payment of Debts and Claims form.
 - f. Contractor affidavit of release of liens on Contractor's Affidavit of Release of Liens form.
 - g. Consent of surety to final payment on Contractor's Consent of Surety to Final Payment form.
 3. Perform final cleaning for Contractor-soiled areas per this Section.
- D. Final Completion Inspection:
1. Within seven days after receipt of request for final inspection, Engineer and Owner will inspect to determine if Work or designated portion is complete.
 2. If Engineer and Owner consider Work incomplete or defective:
 - a. Engineer and Owner will promptly notify Contractor in writing, listing incomplete or defective Work.
 - b. Contractor shall remedy stated deficiencies and send second written request to Engineer and Owner that Work is complete.
 - c. Engineer and Owner will reinspect Work.
 - d. Redo and Inspect Deficient Work: Repeated until Work passes inspection.
 - e. Engineer and Owner inspection.

1.4 STARTING SYSTEMS

- A. Coordinate schedule for startup of various equipment and systems.
- B. Notify Engineer seven days before startup of each item.
- C. Verify each piece of equipment or system was checked for proper lubrication, drive rotation, belt tension, control sequence, and conditions which may cause damage.
- D. Verify tests, meter readings, and electrical characteristics agree with those required by equipment or system manufacturer.
- E. Verify wiring and support components for equipment are complete and tested.
- F. Execute startup under supervision of manufacturer's representative or Contractors' personnel per manufacturer's instructions.
- G. When specified in individual Specifications, require manufacturer to provide authorized representative who will be present at Site to inspect, check, and approve equipment or system installation before startup and supervise placing equipment or system in operation.
- H. Submit a written report per Section 01 33 00 "Submittal Procedures," that equipment or system has properly installed and functioning correctly.

1.5 DEMONSTRATION AND INSTRUCTIONS

- A. Demonstrate operation and maintenance (O&M) of products to Owner's personnel two weeks before date of final inspection.
- B. Demonstrate Project equipment by manufacturer's representative who is knowledgeable about Project.
- C. Use O&M manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
- D. Demonstrate startup, operation, control, adjustment, troubleshooting, servicing, maintenance, and shutdown of each item of equipment at agreed time, at equipment location.
- E. Prepare and insert additional data in O&M manuals when need for additional data is apparent during instruction.
- F. Required instruction time for each item of equipment and system is specified in individual Specifications.

1.6 PROJECT RECORD DOCUMENTS

- A. Maintain onsite, one set of these record documents and record actual revisions to Work:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to Contract.
 - 5. Reviewed Shop Drawings, product data, and Samples.
 - 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress, not less than weekly.
- E. Specifications: Legibly mark and record, at each product Section, description of actual products installed, including:
 - 1. Manufacturer's name, product model and number.
 - 2. Product substitutions or alternates used.
 - 3. Changes made by Addenda and modifications.
- F. Record Drawings and Shop Drawings. Legibly mark each item to record actual construction as:
 - 1. Include Contract modifications such as Addenda, supplementary instructions, change directives, field orders, minor changes in Work, and change orders.
 - 2. Include locations of concealed elements of Work.
 - 3. Identify depth of buried utility lines and provide dimensions showing distances from permanent facility components parallel to utilities.
 - 4. Dimension ends, corners, and junctions of buried utilities to permanent facility components using triangulation.
 - 5. Identify and locate existing buried or concealed items encountered during Project.
 - 6. Measured depths of foundations in relation to finish floor datum.
 - 7. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 8. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of Work.
 - 9. Field changes of dimension and detail.
 - 10. Details not on original Drawings.

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- B. Submit PDF electronic files of marked-up documents to Engineer with claim for final Application for Payment.

1.7 OPERATION AND MAINTENANCE DATA

- A. Submit in PDF composite electronic indexed file.
- B. Submit data bound in 8 1/2- x 11-inch text pages, three, D-side-ring binders with durable plastic covers.
- C. Prepare binder cover with printed Operation and Maintenance Instructions, title of Project
- D. and subject matter of binder when multiple binders required.
- E. Internally subdivide binder contents with permanent page dividers, logically organized as described, with tab titling clearly printed under reinforced laminated plastic tabs.
- F. Drawings: Provide with reinforced punched binder tab. Bind in with text. Fold larger drawings to size of text pages.
- G. Contents: Prepare Table of Contents (TOC) for each volume, with each product or system description identified, typed on white paper, in three parts.
 - Part 1: Directory** listing names, addresses, and phone numbers of Engineer, Contractor, subcontractors, and major equipment suppliers.
 - Part 2: O&M instructions** arranged by Specification Section. For each category, identify names, addresses, and phone numbers of subcontractors and suppliers. Include:
 1. Significant design criteria.
 2. List of equipment.
 3. Parts list for each component.
 4. Operating instructions.
 5. Maintenance instructions for equipment and systems.
 6. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
 7. Safety precautions to take when operating and maintaining or working near equipment.
 - Part 3: Project documents and certificates**, including:
 1. Shop Drawings and product data.
 2. Certificates.
 3. Originals of warranties and bonds.

1.8 SPARE PARTS AND MAINTENANCE PRODUCTS

- A. Furnish spare parts, maintenance, and extra products in quantities specified in individual Specifications.
- B. Deliver to place in location as directed by Owner. Obtain receipt before final payment.

1.9 PRODUCT WARRANTIES AND PRODUCT BONDS

- A. Obtain warranties and bonds executed in duplicate by responsible subcontractors, suppliers, and manufacturers within 10 days after completion of applicable item of Work.
- B. Execute and assemble transferable warranty documents and bonds from subcontractors, suppliers, and manufacturers.
- C. Verify documents are in proper form, contain full information, and notarized.
- D. Co-execute submittals when required.
- E. Include TOC and assemble in three, D-side-ring binder with durable plastic cover.
- F. Submit before final Application for Payment.

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- G. Time of Submittals:
1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
 2. Make other submittals within 10 days after date of Substantial Completion, before final Application for Payment.
 3. For items of Work for which acceptance is delayed beyond Substantial Completion, submit within 10 days after acceptance, listing date of acceptance as beginning of warranty or bond period.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify existing Site conditions and substrate surfaces are acceptable for subsequent Work.
- B. Beginning new Work means acceptance of existing conditions.
- C. Verify existing substrate can structurally support or attach new Work applied.
- D. Examine and verify specific conditions described in individual Specifications.
- E. Verify utility services are available with correct characteristics and in correct locations.

3.2 PREPARATION

- A. Clean substrate surfaces before applying next material or substance per manufacturer instructions.
- B. Seal cracks or openings of substrate before applying next material or substance.
- C. Apply manufacturer-required or -recommended substrate primer, sealer, or conditioner before applying new material or substance in contact or bond.

3.3 EXECUTION

- A. Comply with manufacturer installation instructions, performing each step, in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- B. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- C. Verify field measurements are as indicated on approved Shop Drawings or as instructed by manufacturer.
- D. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.
 1. Secure Work true-to-line and level and within specified tolerances, or if not specified, industry-recognized tolerances.
 2. Physically separate products in place, provide electrical insulation, or provide protective coatings to prevent galvanic action or corrosion between dissimilar metals.
 3. Exposed Joints: Provide uniform joint width and arrange to obtain best visual effect. Refer questionable visual-effect choices to Engineer for final decision.
- E. Allow for expansion of materials and building movement.

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- F. Climatic Conditions and Project Status: Install each unit of Work under conditions to ensure best possible results in coordination with entire Project.
 - 1. Isolate each unit of Work from incompatible Work necessary to prevent deterioration.
 - 2. Coordinate enclosure of Work with required inspections and tests to minimize necessity of uncovering Work for those purposes.
 - G. Mounting Heights: Where not indicated, mount individual units of Work at industry-recognized standard mounting heights for application indicated.
 - 1. Refer questionable mounting heights choices to Engineer for final decision.
 - 2. Elements Identified as Accessible to Handicapped: Comply with applicable codes and regulations.
 - H. Adjust operating products and equipment to ensure smooth and unhindered operation.
 - I. Clean and perform maintenance on installed Work as frequently as necessary through remainder of construction. Lubricate operable components recommended by manufacturer.

3.4 PROTECTING INSTALLED CONSTRUCTION

- A. Protect installed Work and provide special protection where specified.
- B. Provide temporary and removable protection for installed products. Control activity in immediate Work area to prevent damage.
- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- D. Use durable sheet materials to protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects.
- E. Prohibit traffic or storage upon waterproofed or roofed surfaces. When traffic or activity necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- F. Prohibit traffic from landscaped areas.

3.5 FINAL CLEANING

- A. Execute final cleaning before final Project assessment. Employ experienced personnel or professional cleaning firm.
- B. Clean interior and exterior glass and surfaces exposed to view. Remove temporary labels, stains, and foreign substances.
- C. Clean equipment and fixtures to sanitary condition with appropriate cleaning materials.
- D. Clean filters of operating equipment.
- E. Clean debris from roofs, gutters, downspouts, and drainage systems.
- F. Clean site. Sweep paved areas and rake landscaped surfaces clean.
- G. Remove waste and surplus materials, rubbish, and construction facilities from site.

END OF SECTION

SECTION 07 92 00 – JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Furnish materials, labor, transportation, services, and equipment necessary to perform all joint sealant work as indicated on the Construction Drawings. Complete work as specified herein.
 - 2. This section covers the furnishing of material and installation including equipment, appliances necessary to properly complete, all caulking and sealing for interior and exterior joints where indicated or specified herein.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.

1.2 GOVERNING REFERENCE SPECIFICATIONS

- A. The latest editions of the following specifications and references govern the work in this section and constitute minimum requirements. Where specific requirements of this section are more stringent, they shall supersede the corresponding requirements of these Reference Specifications.
- B. American Society for Testing Materials International (ASTM):
 - 1. ASTM C920 – Elastomeric Joint Sealants.
 - 2. ASTM D217 – Cone Penetration of Lubricating Grease.
 - 3. ASTM D1571 – Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).
- C. American Association of State Highway and Transportation Officials (AASHTO):
 - 1. AASHTO M33 – Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).
- D. Federal Specifications
 - 1. TTS-001657 – Sealing Compound, Single-Component, Butyl Rubber (COM-NBS) Based, Solvent Release Type (for Buildings and Other Types of Construction)
 - 2. UU-P-270F - Paper Wrapping, Waxed (dry) & Am-1.
 - 3. PPP-T-42C - Tape, Packaging/Masking, Paper.

1.3 DESCRIPTION OF WORK

- A. Sealants: The extent of each form and type of joint sealant is indicated on the drawings and by provisions of this section.
- B. Application: The applications for joint sealants as work of this section shall include, but not limited to the following:
 - 1. Reinforced Concrete Expansion and Construction joints.

1.4 JOB CONDITIONS

- A. Weather Conditions: Do not proceed with installation of liquid sealants under unfavorable weather conditions. Install elastomeric sealants per the manufacturer's recommendations under the temperature conditions specified for proper installation and adhesion.

1.5 SUBMITTALS

- A. Refer to Section 01 33 00 “Submittal Requirements.”
- B. Product Data: Submit manufacturer's product specifications, handling/installation/ curing instructions, and performance tested data sheets for each elastomeric product required.
- C. Manufacturer’s Certificate: Certify products meet or exceed the specified requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General Performance: Except as otherwise indicated, joint sealants are required to establish and maintain waterproof continuous seals on a permanent basis, within the time period covered in Article 3.5 – Warranties. Failure of installed sealants to comply with this requirement will be recognized as failures of materials and workmanship.
- B. Provide colors as selected by Engineer from manufacturer's standard colors. Select materials for compatibility with joint surfaces and other indicated exposures, and except as otherwise indicated select modulus of elasticity and hardness or grade recommended by manufacturer for each application indicated.
- C. Elastomeric Sealants:
 - 1. Silicone Rubber Sealant: Silicone rubber-based, one-part elastomeric sealant, complying with ASTM C 920, Class 50, Type S (single Component) and NS (nonsag); recommended by manufacturer for exterior joints in concrete or rock.
 - 2. Acceptable manufactures:
 - Dow Corning Corporation 888, Silicone Joint Sealant;
 - Dow Corning Corporation; 890-SL, Silicone Joint Sealant;
 - GE Silicones; SilPruf NB SC9000;
 - GE Silicones; UltraPruf II SCS2900;
 - Or Approved Equal.
- D. Joint Fillers:
 - 1. Compressible Joint Filler (size as indicated on Construction Drawings):
 - a. Compressible and non-extruding premolded polystyrene board.
 - b. Bituminous premolded joint filler (conforming to AASHTO M-33 and/or ASTM D1751).
 - 2. Backer Rod: Compressive rod stock of closed polyethylene foam, polyethylene jacketed polyurethane foam, butyl rubber foam, neoprene foam or other flexible, permanent, durable non-absorptive material as recommended by sealant manufacturer for compatibility with sealant.
- E. Miscellaneous Materials:
 - 1. Joint Primer/Sealer: Provide type of joint primer/sealer recommended by sealant manufacturer for joint surfaces to be primed or sealed.
 - 2. Bond Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer to be applied to sealant-contact surface where bond to substrate or joint filler must be avoided for proper performance of sealant. Provide self-adhesive tape where applicable.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Comply with manufacturer's printed instructions except where more stringent requirements are shown or specified, and except where manufacturer's technical representative directs otherwise.

3.2 JOINT PREPARATION

- A. Clean joint surfaces: Immediately before installation of sealant or caulking compound. Remove dirt, insecure coatings, moisture and other substances, which could interfere with bond of sealant or caulking compound. Etch concrete joint surfaces as recommend by sealant manufacturer. Include other joint preparation requirements as required by the sealant manufacturer and as indicated on Drawings.
- B. Prime or seal joint surfaces: Where indicated and where recommended by sealant manufacturer. Do not allow primer/sealer to spill or migrate onto adjoining surfaces.

3.3 INSTALLATION

- A. Set joint filler units at proper depth or position in joint to coordinate with other work, including installation of bond breakers, backer rods and sealants. Do not leave voids or gaps between the ends of joint filler units.
- B. Install sealant backer rod for elastomeric sealants, except where shown to be omitted or recommended to be omitted by sealant manufacturer for application indicated.
- C. Install bond breaker tape where indicated and where required by manufacturer's recommendations to ensure that elastomeric sealants will perform properly.
- D. Employ only proven installation techniques, which will ensure that sealants are deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of joint bond surfaces equally on opposite concave surface, slightly below adjoining surfaces.
 - 1. Where horizontal joints are between a horizontal surface and vertical surface, fill joint to form a slight cove, so that joint will not trap moisture and dirt.
 - 2. For concrete joints sealed with elastomeric sealants and subject to traffic and other abrasion and indentation exposures, fill joints to a depth equal to 75% of joint width, but neither more than 5/8" deep nor less than 3/8" deep.
- E. Spillage: Do not allow gaskets or compounds to overflow or spill onto adjoining surfaces, or to migrate into voids of adjoining surfaces. Clean adjoining surfaces by whatever means may be necessary to eliminate evidence of spillage.
- F. Recess exposed edges of gasket and exposed joint filler slightly behind adjoining surfaces, unless otherwise shown, so that compressed units will not protrude from joints.

3.4 CURE AND PROTECTION

- A. Cure sealants and caulking compounds in compliance with manufacturer's instructions and recommendations, to obtain high early bond strength, internal cohesive strength and surface durability. Sealant Installer shall advise Contractor of procedures required for cure and protection of joint sealants during construction period, so that they will be without deterioration or damage (other than normal wear and weathering) at time of substantial completion.

3.5 WARRANTIES

- A. Manufacturer's Warranty: Submit an executed copy of Sealant Manufacturer's Standard Warranty Agreement signed by an authorized representative of the Sealant System Manufacturer for one year.

END OF SECTION

SECTION 31 05 13 - SOILS FOR EARTHWORK

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Subsoil materials.
 - 2. Topsoil materials.
- B. Related Requirements:
 - 1. Section 31 05 16 "Aggregates for Earthwork:" Coarse and fine aggregate materials.
 - 2. Section 31 22 13 "Rough Grading:" Removal of topsoil, rough grading, and filling associated with contouring of Site.
 - 3. Section 31 23 16 "Excavation:" Excavating as required for building foundations and utilities within building perimeter.
 - 4. Section 31 23 23 "Fill:" Backfilling as required at building perimeter and Site structures to subgrade elevations.
 - 5. Section 31 41 10 "Trench Safety."

1.2 REFERENCE STANDARDS

- A. American Association of State Highway and Transportation Officials:
 - 1. AASHTO T 180 - Standard Method of Test for Moisture-Density Relations of Soils Using a 10-lb Rammer and an 18-in. Drop.
- B. ASTM International:
 - 1. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³).
 - 2. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³).
 - 3. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
 - 4. ASTM D6938 - Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

1.3 SUBMITTALS

- A. Section 01 33 00 "Submittal Procedures:" Requirements for submittals.
- B. Product Data: Submit name of imported materials source.
- C. Samples: Submit, in airtight containers, 10-lb sample of each type of fill to testing laboratory.
- D. Supplier's Certificate: Certify that products meet or exceed specified requirements.
- E. Source Quality-Control Submittals: Indicate results of shop tests and inspections.

1.4 QUALITY ASSURANCE

- A. Furnish each subsoil material from single source throughout Work.
- B. Perform Work according to City of El Paso standards.
- C. Maintain 2 copies of each standard affecting Work of this Section on Site.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Subsoil:
 - 1. Comply with City of El Paso standards.
 - a. Excavated and reused material and imported borrow.
 - b. Graded.
 - c. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris.

2.2 SOURCE QUALITY CONTROL

- A. Testing and Analysis:
 - 1. Subsoil Material: Comply with ASTM D698.
 - 2. If tests indicate materials do not meet specified requirements, change material and retest.
- B. Owner Inspection:
 - 1. Make subsoil available for inspection at source prior to packaging for shipment.
 - 2. Notify Owner at least seven days before inspection is allowed.
- C. Owner Witnessing:
 - 1. Allow witnessing of source testing at supplier's test facility.
 - 2. Notify Owner at least seven days before tests are scheduled.
- D. Certificate of Compliance:
 - 1. If supplier is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at source conforms to Contract Documents.
 - 2. Specified source tests are not required for Work performed by approved supplier.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Excavation:
 - 1. Excavate subsoil from designated areas.
 - 2. Remove excess excavated materials not intended for reuse from Site.
 - 3. Remove excavated materials not meeting requirements for subsoil materials from Site.
- B. Stockpiling:
 - 1. Stockpile excavated material meeting requirements for subsoil materials.
 - 2. Stockpile materials on Site at locations as designated by Engineer.
 - 3. Stockpile in sufficient quantities to meet Project schedule and requirements.
 - 4. Separate differing materials with dividers or stockpile apart to prevent intermixing of soil types or contamination.
 - 5. Stockpile topsoil maximum 8 feet high.
 - 6. Direct surface water away from stockpile to prevent erosion or deterioration of materials.
 - 7. Consider including following Subparagraph for contaminated or hazardous materials awaiting transportation to be disposed of off-Site.
 - 8. Stockpile unsuitable materials on impervious material and cover to prevent erosion and leaching until they are disposed.

3.2 CLEANING

- A. Stockpile:
1. Remove stockpile and leave area in clean and neat condition.
 2. Grade Site surface to prevent freestanding surface water.

END OF SECTION

SECTION 31 10 00 - SITE CLEARING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Stormwater Pollution Prevention Plan (SWPPP).
 - 2. Remove surface debris.
 - 3. Clear site of plant life.
 - 4. Remove root system of trees and shrubs.
 - 5. Topsoil excavation.
 - 6. Excavation will not be classified, and no additional compensation will be allowed for rock. Bidders shall make such investigations of the nature of material to be encountered in excavations as they deem necessary and shall assume all responsibility for fully informing themselves of the character of such material.
 - 7. Contractor shall furnish all materials, equipment tools, labor, superintendence, and incidentals required to perform the Work as indicated on the Drawings, as directed by Engineer, and as specified.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.
 - 2. Section 31 41 10 "Trench Safety System"

1.2 REGULATORY REQUIREMENTS

- A. Stormwater Discharge:
 - 1. Prepare and sign applicable Construction Site Notice at least two days prior to commencing any clearing or grading of the site.
 - 2. Post a copy of applicable Construction Site Notice at the construction site where readily available for viewing until completion of construction activity.
 - 3. Prepare and submit a Notice of Intent (NOI) for Stormwater Discharges and the required application fee to Texas Commission on Environmental Quality (TCEQ) at least two days prior to commencing any clearing or grading site.
 - 4. Post a copy of NOI at construction site where readily available for viewing until completion of construction activity.
- B. Stormwater Pollution Prevention Plan (SWPPP):
 - 1. Prepare, implement, and document implementation of a SWPPP in accordance with provisions set forth in the latest version of the Texas Pollution Discharge Elimination System (TPDES) General Permit No. TXR150000.
 - 2. Submitted to the local authority having jurisdiction.
 - 3. Provide a copy of SWPPP and submit NOI, NOC, and NOT to Owner accordingly.
 - 4. Continually updated as necessary to reflect current and changing conditions on site.
 - 5. Contractor shall modify document as necessary to show implementation plans, dates of construction activities, best management practices, installation dates or modifications, inspection reports, and any other information pertinent to the plan or otherwise required to ensure plan remains in compliance with TPDES permit.
- C. Conform to applicable Texas Commission on Environmental Quality (TCEQ) code for disposal of debris.
- D. Coordinate clearing Work with local utility companies.

1.3 PROJECT CONDITIONS

- A. Traffic: Conduct site clearing operations to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks, or other occupied or used facility or facilities without permission from authorities having jurisdiction.

1.4 TRENCH SAFETY

- A. Contractor shall be responsible for complying with the applicable OSHA regulations concerning trench excavation, general excavation, and construction safety.
- B. Contractor shall be responsible for implementing a trench safety system wherever the trench depth exceeds 5 feet. Contractor shall refer to Section 31 41 10 "Trench Safety Systems," and to the details shown on the Plans for approved trench safety methods for pipelines.

PART 2 - PRODUCTS - NONE

PART 3 - EXECUTION

3.1 PREPARATION

- A. Verify that existing plant life designated to remain is tagged or identified.

3.2 PROTECTION

- A. Existing Services:
 - 1. Indicated locations are approximate. Determine exact locations before commencing work.
 - 2. Locate, identify, and protect from damage utilities that remain.
- B. Protect trees, plant growth, and features designated to remain as final landscaping.
- C. Protect benchmarks from damage or displacement.
- D. Protection of Existing Improvements: Provide protections necessary to prevent damage to existing improvements indicated to remain in place.
 - 1. Protect improvements on adjoining properties and on Owner's property.
 - 2. Restore damaged improvements to their original condition, as acceptable to property owners.
- E. Protection of Existing Trees and Vegetation: Protect existing trees and other vegetation indicated to remain in place against unnecessary cutting, breaking or skinning of roots, skinning or bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip line, excess foot or vehicular traffic, or parking of vehicles within drip line. Provide temporary guards to protect trees and vegetation from being left standing.
 - 1. Water trees and other vegetation to remain within limits of Contract Work as required to maintain their health during course of construction operations.
 - 2. Provide protection for roots over 1-1/2-inch in diameter that are cut during construction operations. Coat cut faces with an emulsified asphalt or other acceptable coating formulated to use on damaged plant tissues. Temporarily cover exposed roots with wet burlap to prevent roots from drying out, cover with earth as soon as possible.

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- 3. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations in a manner acceptable to the Engineer.
 - F. Existing utilities that serve adjacent properties shall remain in place with existing capacity and functionality.

3.3 CLEARING

- A. Clear areas required for access to site and execution of Work.
- B. Remove paving, curbs, gutters, and concrete.
- C. Remove trees and shrubs indicated. Remove stumps and main root ball to a depth of 60 inches.
- D. Clear undergrowth and deadwood without disturbing subsoil.
- E. Apply herbicide to remaining roots to inhibit growth. Do not apply herbicide to roots in areas indicated to have future planting.
- F. Arrange and pay for disconnecting, removing, capping, and plugging utility services. Notify affected utility companies in advance and obtain approval before starting this Work.

3.4 REMOVAL

- A. Remove debris, rock, and extract plant life from site.
- B. Remove trees, shrubs, grass, and other vegetation, improvements, or obstructions, as required, to permit installation of new construction. Remove similar items elsewhere on site or premises as specifically indicated. Removal includes digging out and off-site disposal of stumps and roots. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.
- C. Removal of Improvements: Remove existing above-grade and below-grade improvements as indicated and as necessary to facilitate new construction.
 - 1. Abandonment or removal of certain underground pipe or conduits may be indicated on Electrical Drawings and is included under Work of related Division 16 Sections. Removing abandoned underground piping or conduits interfering with construction is included under this Section.
 - 2. Place markers to indicate the location of disconnected services.

3.5 TOPSOIL EXCAVATION

- A. Topsoil: ASTM D5268 Topsoil is defined as friable clay loam surface soil found in a depth of not less than 4 inches. Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones, and other objects over 2 inches in diameter, and without weeds, roots, and other objectionable material.
- B. Stripping:
 - 1. Remove heavy growths of grass from areas before stripping.
 - 2. Beneath proposed paved areas, strip topsoil to whatever depths encountered in a manner to prevent intermingling with underlying subsoil or other objectionable material.
 - 3. Where existing trees are indicated to remain, leave existing topsoil in place within drip lines to prevent damage to root system.
- C. Stockpiling:
 - 1. Stockpile topsoil in storage piles in areas indicated or directed. Construct storage piles to provide free drainage of surface water. Cover storage piles, if required, to prevent water and wind erosion.
 - 2. Dispose of unsuitable or excess topsoil as specified for disposal of waste material.

3.6 DISPOSAL OF WASTE MATERIALS

- A. Burning on Owner's Property: Burning is not permitted on Owner's property.
- B. Removal from Owner's Property: Remove waste materials and unsuitable or excess topsoil from Owner's property.
- C. Contractor shall lawfully dispose of all material removed from the job site.

3.7 TRENCHING AND BACKFILLING PIPELINES

- A. Excavation for pipe trenches shall be made to the lines and grades shown on the Drawings and established in the field. Trenching and backfilling for water pipelines are specified in other Sections of these Specifications.

3.8 CLEAN UP

- A. After completion of all Work in connection with the Project, the entire work area and any adjacent areas disturbed by the construction shall be cleaned of all construction debris, rocks, and excess materials and all such material shall be removed from the site or highway right-of-way and disposed of by Contractor. Any sod disturbed by the installation of these facilities shall be replaced. The entire area shall be graded to uniform surfaces and shall present a neat and clean appearance before Final Acceptance.

3.9 RECORD DOCUMENTS

- A. Identify service lines and capping locations on Project Record Documents.

END OF SECTION

SECTION 31 22 13 - ROUGH GRADING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Include the following paragraph when topsoil excavation is included in this section. Topsoil excavation may be specified in 02230. Edit this section and coordinate accordingly.
 - 2. Excavating topsoil.
 - 3. Excavating subsoil.
 - 4. Cutting, grading, filling, rough contouring, and compacting.
- B. Related Sections:
 - 1. Division 01 Specification Sections apply to Work of this Section.
 - 2. Section 31 05 13 "Soils for Earthwork: Soils for fill"
 - 3. Section 31 10 00 "Site Clearing: Excavating topsoil"
 - 4. Section 31 23 16 "Excavation"
 - 5. Section 31 41 10 "Trench Safety Systems"
 - 6. Section 31 23 23 "Fill:" General building area backfilling.

1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials:
 - 1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.
- B. ASTM International:
 - 1. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - 2. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³).
 - 3. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
 - 4. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³).
 - 5. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
 - 6. ASTM D2419 - Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
 - 7. ASTM D2434 - Standard Test Method for Permeability of Granular Soils (Constant Head).
 - 8. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
 - 9. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.3 SUBMITTALS

- A. Section 01 33 00 "Submittal Procedures:" Requirements for submittals.
- B. Samples: Submit, in air-tight containers, 10 lb sample of each type of Type fill to testing laboratory.

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- C. Materials Source: Submit name of imported materials suppliers.
 - D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with ASTM C136, ASTM D2419, and ASTM D2434.
- B. Perform Work in accordance with City of El Paso Standards.
- C. Maintain two copies of each document on site.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Topsoil: As specified in Section 31 05 13.
- B. Subsoil Fill: As specified in Section 31 05 13.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 "Administrative Requirements:" Verification of existing conditions before starting work.
- B. Verify survey benchmark and intended elevations for the Work are as indicated on Drawings.

3.2 PREPARATION

- A. Call Local Utility Line Information service not less than three working days before performing Work.
 - 1. Request underground utilities to be located and marked within and surrounding construction areas.
- B. Identify required lines, levels, contours, and datum.
- C. Protect utilities indicated to remain from damage.
- D. Protect benchmarks, survey control point, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

3.3 TOPSOIL EXCAVATION

- A. Excavate topsoil from areas to be further excavated, relandscaped, or regraded without mixing with foreign materials for use in finish grading.
- B. Do not excavate wet topsoil.
- C. Stockpile in area designated on site to depth not exceeding 8 feet and protect from erosion.
- D. Remove excess topsoil not intended for reuse, from site.

3.4 SUBSOIL EXCAVATION

- A. Excavate subsoil from areas to be further excavated, relandscaped, or regraded.
- B. Do not excavate wet subsoil or excavate and process wet material to obtain optimum moisture content.
- C. When excavating through roots, perform Work by hand and cut roots with sharp axe.
- D. Remove excess subsoil not intended for reuse, from site.

3.5 FILLING

- A. Fill areas to contours and elevations with unfrozen materials.
- B. Place material in continuous layers as follows:
 - 1. Subsoil Fill: Maximum 8 inches compacted depth.
 - 2. Structural Fill: Maximum 6 inches compact depth.
 - 3. Granular Fill: Maximum 6 inches compact depth.
- C. Maintain optimum moisture content of fill materials to attain required compaction density.
- D. Make grade changes gradually. Blend slope into level areas.
- E. Repair or replace items indicated to remain damaged by excavation or filling.

3.6 TOLERANCES

- A. Top Surface of Subgrade: Plus or minus 1/10 foot from required elevation.

3.7 FIELD QUALITY CONTROL

- A. Perform laboratory material tests in accordance with ASTM D1557.
- B. Perform in place compaction tests in accordance with the following:
 - 1. Density Tests: ASTM D1556, ASTM D2167, or ASTM D2922.
 - 2. Moisture Tests: ASTM D3017.
- C. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

END OF SECTION

SECTION 31 23 16 - EXCAVATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Soil densification.
 - 2. Excavating for building foundations.
 - 3. Excavating for paving and parking areas.
 - 4. Excavating for slabs on grade.
 - 5. Excavating for Site structures.
 - 6. Excavating for landscaping.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.
 - 2. Section 31 22 13 "Rough Grading"
 - 3. Section 31 23 16 "Excavation:" Excavating as required for building foundations and utilities within building perimeter.
 - 4. Section 31 23 23 "Backfill:" Backfilling at building perimeter and Site structures, and fill under slabs on grade, pavement, and landscaped areas.

1.2 REFERENCE STANDARDS

- A. Local utility standards when working within 36 inches of utility lines.

1.3 SUBMITTALS

- A. Section 01 33 00 "Submittal Procedures:" Requirements for submittals.
- B. Shop Drawings:
- C. Indicate soil densification grid for each size and configuration footing requiring soil densification.
 - 1. Excavation Protection Plan:
 - a. Describe sheeting, shoring, and bracing materials and installation, as required, to protect excavations and adjacent structures and property.
 - b. Submit signed and sealed Shop Drawings with design calculations and assumptions to support plan.
- D. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
- E. Qualifications Statement:
 - 1. Submit qualifications for licensed professional.

1.4 QUALITY ASSURANCE

- A. Perform Work according to OSHA standards.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PREPARATION

- A. Section 01 70 00 "Execution and Closeout Requirements:" Requirements for installation preparation.
- B. Utility Service Locator:
 - 1. Call local utility service-line information at 811 not less than three working days before performing Work.
 - 2. Request that underground utilities be located and marked within and immediately surrounding the Site.
 - 3. Identify required lines, levels, contours, and data.
- C. Existing Utilities:
 - 1. Notify utility company to remove or relocate utilities.
 - 2. Protect from damage utilities indicated to remain.
- D. Protect plant life and other features designated to remain as portion of final landscaping.
- E. Protect benchmarks, survey control points, existing structures, fences, paving, and curbs from excavating equipment and vehicular traffic.
- F. Do not close or obstruct roadways or hydrants without permits.
- G. Erect and maintain temporary barriers and security devices, including warning signs, warning lights, and similar measures, for protection of public and existing improvements indicated to remain.

3.2 EXCAVATION

- A. Underpin adjacent structures which may be damaged by excavation Work.
- B. Excavate subsoil to accommodate building foundations, slabs on grade, paving, Site structures and construction operations.
- C. Compact disturbed load-bearing soil in direct contact with foundations to original bearing capacity, as specified in Section 31 23 23 "Fill."
- D. Slope banks with machine to angle of repose or less until shored.
- E. Do not interfere with 45-degree bearing splay of foundations.
- F. Grade top perimeter of excavation to prevent surface water from draining into excavation.
- G. Trim excavation and remove loose matter.
- H. Removal of Deleterious Materials:
 - 1. Remove lumped subsoil, boulders, and rock.
 - 2. Remove excess and unsuitable material from Site.
- I. Notify Architect/Engineer of unexpected subsurface conditions.
- J. Correct over-excavated areas as specified in Section 31 23 23 "Fill."
- K. Remove excavated material from Site.
- L. Stockpile subsoil in area designated on Site to depth not exceeding six feet and protect from erosion.
- M. Repair or replace items indicated to remain that have been damaged by excavation.

3.3 FIELD QUALITY CONTROL

- A. Section 01 70 00 "Execution and Closeout Requirements:" Requirements for testing, adjusting, and balancing.
- B. Inspecting: Request visual inspection of bearing surfaces by Engineer before installing subsequent Work.

3.4 PROTECTION

- A. Section 01 70 00 "Execution and Closeout Requirements:" Requirements for protecting finished Work.
- B. Prevent displacement or loose soil from falling into excavation and maintain soil stability.
- C. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.
- D. Protect structures, utilities, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that may be created by earth operations.

END OF SECTION

SECTION 31 23 23 - FILL

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Backfilling to subgrade elevations.
 - 2. Site filling and backfilling.
- B. Related Requirements:
 - 1. Section 31 05 13 "Soils for Earthwork"
 - 2. Section 31 23 16 "Excavation"

1.2 REFERENCE STANDARDS

- A. American Association of State Highway and Transportation Officials:
 - 1. AASHTO T 180 - Standard Method of Test for Moisture-Density Relations of Soils Using a 10-lb Rammer and a 18-inch Drop.
- B. ASTM International:
 - 1. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³).
 - 2. ASTM D1556/D1556M - Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method.
 - 3. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³).
 - 4. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
 - 5. ASTM D6031/D6031M - Standard Test Method for Logging In Situ Moisture Content and Density of Soil and Rock by the Nuclear Method in Horizontal, Slanted, and Vertical Access Tubes.
 - 6. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Structural Fill Material:
 - 1. Structural fill soils may consist of granular clayey, silty sands or sandy clayey, silty gravel mixtures, free of clay lumps, deleterious materials, organic material, cobbles, or boulders over 3-inches in nominal size. The alternative structural fill shall have a liquid limit less than 35 and a plasticity index from 3 to 12. The alternative structural fill shall also exhibit an optimum dry density of at least 130 pcf. Alternative structural fill soils shall also meet the gradation requirements below:

Sieve Size (square opening)	% Passing by Weight
3 -inch	100
¾-inch	85 - 100
No. 4	35 - 85
No. 200	5 - 35

2. Alternate structural fill soils shall classify as SM, SC, SC-SM, GM, GC, GC-GM, GP-GM, and GP-GC in accordance with the Unified Soil Classification System (USCS). Alternative structural fill soils that meet the gradation, optimum dry density, and soil classification requirements indicated above, but are non-plastic by test, shall be accepted only if these soils exhibit a bar linear shrinkage between 2 to 7 percent determined by test method TEX-107E.

B. Select Fill Material:

1. Select fill soil shall consist of granular clayey, silty sands or sandy clayey, silty gravel mixtures, free of clay lumps, deleterious materials, organic material, cobbles or boulders over 3-inches in nominal size. The select fill shall have a liquid limit less than 35 and a plasticity index less than 12. The select fill shall also exhibit an optimum dry density of at least 120 pcf determined in accordance with ASTM D 1557. Select fill shall also meet the gradation requirements below:

Sieve Size (square opening)	% Passing by Weight
3-inch	100
¾-inch	85 - 100
No. 4	45 - 85
No. 200	3 - 45

Select fill soils shall classify as SP-SM, SM, SC, SC-SM, GM, GC, GC-GM, GP-GC, and GP-GM in accordance with the Unified Soil Classification System (USCS).

2. Alternative select fill soils that meet the gradation, optimum dry density, and soil classification requirements indicated above, but are non-plastic by test, shall be accepted only if these soils exhibit a bar linear shrinkage between 2 to 7 percent determined by test method TEX-107E.

C. Native Fill Soil Material:

1. Native fill soil shall consist of granular clayey, silty sands or sandy clayey, silty gravel mixtures, free of clay lumps, deleterious materials, organic material, cobbles or boulders over 3-inches in nominal size. The native fill soils shall have a liquid limit less than 40 and a plasticity index less than 15. Native fill soils shall also meet the gradation requirements below:

Sieve Size (square opening)	% Passing by Weight
3-inch	100
¾-inch	70 - 100
No. 4	45 - 100
No. 200	3 - 45

Native fill soils shall classified in the following list according to the USCS shall be considered satisfactory for use: SP-SM, SM, SW, SC, SC-SM, SP-SC, GW, GP, GM, GC, GP-GC, and GP-GM provided these soils also meet the requirements above.

On-site soils classified as SP shall be blended with low-plasticity clayey sands or as appropriate to mitigate potential soil sloughing during excavations in these types of soils and to create a relatively stable blended soil material that exhibits adequate

bearing capacity. The blended soils shall meet the requirements of suitable native fill above.

Soils classified as CH, CL, MH, ML, OH, OL and PT or a combination of these under the USCS classification and soils that exhibit a plasticity index greater than 15 are not considered suitable for use as suitable native fill, select fill, or structural fill soil materials. on 310519.13 - Geotextiles for Earthwork.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Compact subgrade to specified density requirements for subsequent backfill materials.
- B. Soft Subgrade:
 - 1. Cut out soft areas of subgrade not capable of compaction in place.
 - 2. Backfill with structural fill and compact to density equal to or greater than specified requirements for subsequent fill material.

3.2 BACKFILLING

- A. Backfill areas to contours and elevations.
- B. Systematically backfill to allow maximum time for natural settlement.
- C. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces, and do not backfill with frozen materials.
- D. Use placement method that does not disturb or damage foundation perimeter drainage, utilities in trench.
- E. Maintain optimum moisture content of fill materials to attain required compaction density.
- F. Make gradual grade changes and blend slope into level areas.
- G. Remove surplus backfill materials from Site.
- H. Leave fill material stockpile areas free of excess fill materials.

3.3 TOLERANCES

- A. Top Surface of Backfilling: Plus, or minus 1/2- inch from required elevations.

3.4 FIELD QUALITY CONTROL

- A. Inspecting: Request visual inspection of bearing surfaces by Engineer before installing subsequent Work.
- B. Testing:
 - 1. AASHTO T 180 in following Subparagraph is similar to ASTM D1557.
 - 2. Laboratory Material Testing: Comply with AASHTO T 180, ASTM D698, ASTM D1557, and ASTM D6938.
 - 3. In-Place Compaction Testing:
 - a. Density Tests: Comply with ASTM D1556/D1556M, D2167, or D6938.
 - b. Moisture Tests: Comply with ASTM D6031/D6031M.
 - 4. If tests indicate that Work does not meet specified requirements, remove Work, replace, compact, and retest.

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5. Testing Frequency:
 - a. At least one (1) Moisture-Density Relationship test (Proctor) for each type of in-situ soil and/or imported material to be used, according to ASTM D 1557.
 - b. At least one (1) Soil Classification (Sieve Analysis and Atterberg Limits Test) for each type of in-situ soil and/or imported material to be used, according to ASTM D 6913 and D 4318.
 - c. A minimum of one (1) nuclear density test per lift at 50 lineal feet spacings for pipe bedding and backfill operations, according to ASTM D 6938 or D 1556.
 - d. A minimum of one (1) nuclear density test per each lift of subgrade preparation and/or fill placement for each drainage structure according to ASTM D 6938 or D 1556.

3.5 PROTECTION

- A. Reshape and recompact fills subjected to vehicular traffic during construction.

END OF SECTION

SECTION 31 32 00 – SOIL STABILIZATION SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes providing all material, labor, tools and equipment for installation of Cellular Confinement System as shown in the Contract Documents and as specified in this section.
- B. The Cellular Confinement System shall be used for channel protection.
- C. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.
 - 2. Section 01 30 00 “Administrative Requirements”
 - 3. Section 31 22 13 “Rough Grading”

1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials (AASHTO)
 - 1. AASHTO M218 - Steel Sheet, Zinc-Coated (Galvanized) for Corrugated Steel Pipe
 - 2. ASSHTO M288 - Geotextile Specification for Highway Applications
- B. American Society of Testing and Materials (ASTM)
 - 1. ASTM D 1505 - Density of Plastics by the Density-Gradient Technique
 - 2. ASTM D 1603 - Standard Test for Carbon Black in Olefin Plastics
 - 3. ASTM D 1693 - Environmental Stress-Cracking of Ethylene Plastics
 - 4. ASTM D 5199 - Measuring Nominal Thickness of Geotextiles and Geomembranes
 - 5. ASTM D 5394 - Standard Test Method for Environmental Stress-Cracking of Ethylene Plastics
 - 6. ASTM D 5596 - Standard Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics
 - 7. ASTM D 5721 - Standard Practice for Air-Oven Aging of Polyolefin Geomembranes
 - 8. ASTM D 5885 - Standard Test Method for Oxidative Induction Time of Polyolefin Geosynthetics by High-Pressure Differential Scanning Calorimetry
 - 9. ASTM D 6693 (Type IV) - Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes
 - 10. ASTM D 7328 - Standard Test Method for Effect of Exposure of Unreinforced Polyolefin Geomembrane Using Fluorescent UV Condensation Apparatus
- C. US Army Corps of Engineers (USACE)
 - 1. Technical Report GL-86-19, Appendix A
- D. International Organization for Standardization (European Union) (EN-ISO)
 - 1. ISO 6721 - Plastics – Determination of Dynamic Mechanical Properties
 - 2. EN ISO 10319 - Geosynthetics – Wide-Width Tensile Test
 - 3. EN 12224 - Geotextiles and geotextile-related products – Determination of the resistance to weathering
 - 4. EN ISO 13426 - Geotextiles and geotextile-related products – Strength of Internal Structural Junctions – Part 1: Geocells
 - 5. EN ISO 13438 - Screening Test Method for Determining the Resistance of Geotextiles and Geotextile-Related Products to Oxidation

1.3 SUBMITTALS

- A. Submit manufacturer's shop drawings in accordance with Section 00 13 00, submittals including Manufacturer's product data, samples and section layout.
- B. Design Calculations and Drawings. Provide a complete set of design calculations including a description of the static analysis performed to determine the channel and crest anchorage requirements.
 - 1. The calculations shall be submitted at the time of bid.
 - 2. Minimum overall design factor of safety shall be 1.4.
 - 3. The calculations shall be based on computer software specific to the Manufacturer's material and accessories. The software shall be founded on sound engineering principles, research/testing and stability analysis.
 - 4. The stability analysis shall be based on accredited third party university testing for the aggregate infill. Provide third party research summary for the stability analysis specific to Manufacturer's material design values and panel connectors.
 - 5. At a minimum; include design conditions, slope stability calculations, calculated factors of safety and friction angles Provide the number of stakes, stake length, attachment device and spacing.
 - 6. The stability calculations shall be in Microsoft Excel converted to Adobe PDF format.
 - 7. Cross section and plan view drawings shall be in AutoCAD converted to Adobe PDF format.
- C. Manufacturer's Certificate of Analysis: Manufacturer shall supply certificate of analysis containing the following test results for the cellular confinement material used for project: Base Resin Lot Number(s), Resin Density per ASTM-1505, Production Lot Number(s), Material Thickness, Short Term Seam Peel Strength, and percentage of Carbon Black. Submit qualifications certifying the installer is experienced in the installation of the specified products.
- D. Submit qualifications of Manufacturer's field representative certifying the field representative is experienced in the installation of the specified products.
- E. No material will be considered as an equivalent to the geocell material specified herein unless it meets all requirements of this specification, without exception. Manufacturers seeking to supply what they represent as equivalent material must submit records, data, independent test results, samples, certifications, and documentation deemed necessary by the Engineer to prove equivalency. The Engineer shall approve or disapprove other Manufacturers' materials in accordance with the General Conditions after all information is submitted and reviewed. Any substitute materials submitted shall be subject to independent lab testing at the contractor's expense.

1.4 QUALITY ASSURANCE AND CONTROL

- A. The cellular confinement system material shall be provided from a single Manufacturer for the entire project.
- B. The Manufacturer's Quality Management System shall be certified and in accordance with ISO 9001:2015 and CE certification. Any substitute materials submitted shall provide a certification that their cellular confinement manufacturing process is part of an ISO program, and a certification will be required specifically stating that their testing facility is certified and in accordance with ISO. An ISO certification for the substitute material will not be acceptable unless it is proven it pertains specifically to the geocell manufacturing operations.

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- C. The Manufacturer shall provide certification of compliance to all applicable testing procedures and related specifications upon the customer's written request. Request for certification shall be submitted no later than the date of order placement. The Manufacturer shall have a minimum of 20 years' experience producing cellular confinement systems.
 - D. Pre-Installation Meeting: Prior to installation of any materials, conduct a pre-installation meeting to discuss the scope of work and review installation requirements. The pre-installation meeting shall be attended by all parties involved in the installation of the cellular confinement system.
 - E. Manufacturer's Field Representative Qualifications:
 - 1. Manufacturer shall provide a qualified field representative on site at the start of construction to ensure the system is installed in accordance with the Contract Documents.
 - 2. Manufacturer's field representative shall have a minimum of 5 years' installation experience with the specified products in the specified application.
 - 3. Manufacturer of any substitute materials to be used shall certify that a representative can meet the above criteria and will be on site for initial construction start up. Manufacturers other than Presto will be required to provide proof the representative meets these qualifications.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to site in Manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and Manufacturer.
- B. The materials shall be stored in accordance with Manufacturer's instructions. The materials shall be protected from damage and away from direct sunlight.
- C. The materials shall be delivered, unloaded and installed in a manner to prevent and minimize damage.

1.6 WARRANTY

- A. The Manufacturer shall warrant each section that it ships to be free from defects in materials and workmanship at the time of manufacture. The Manufacturer's exclusive liability under this warranty or otherwise will be to furnish without charge to the original f.o.b. point a replacement for any section which proves to be defective under normal use and service during the 10-year period which begins on the date of shipment. The Manufacturer reserves the right to inspect any allegedly defective section to verify the defect and ascertain its cause.
- B. This warranty shall not cover defects attributable to causes or occurrences beyond the Manufacturer's control and unrelated to the manufacturing process, including, but not limited to, abuse, misuse, mishandling, neglect, improper storage, improper installation, improper alteration or improper application.
- C. In no event shall the Manufacturer be liable for any special, indirect, incidental or consequential damages for the breach of any express or implied warranty or for any other reason, including negligence, in connection with the cellular confinement system.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Manufacturing Certification
 - 1. The Manufacturer shall have earned a certificate of registration, which demonstrates that its quality-management system for its cellular confinement system is currently registered to the ISO 9001:2015 and CE quality standards.
- B. Base Materials
 - 1. Polyethylene Stabilized with Carbon Black
 - a. Density shall be 58.4 to 60.2 pound/ft³ in accordance with ASTM D 1505.
 - b. Environmental Stress Crack Resistance (ESCR) shall be 5000 hours in accordance with ASTM D 1693.
 - c. Resistance to Oxidation shall be minimum of 100 years in accordance with EN ISO 13438.
 - d. 100% of original strip tensile strength shall be retained following exposure to accelerated weathering in accordance with EN 12224.
 - e. The Flexural Storage Modulus shall be a minimum of 800 MPa in accordance with ISO 6721.
 - f. Ultra-Violet light stabilization with carbon black.
 - g. Carbon Black content shall be 1.5 to 2 percent by weight, through addition of a carrier with certified carbon black content.
 - h. Carbon black shall be homogeneously distributed throughout material.
 - i. The manufacturer must have an in-place quality control to prevent irregularities in strip material.
- C. Cell Properties
 - 1. Individual cells shall be uniform in shape and size when expanded.
 - 2. Individual cell dimensions (nominal) shall be dimensions $\pm 10\%$.
 - 3. Geocell
 - a. Length shall be 11.3 inches.
 - b. Width shall be 12.6 inches.
 - c. Nominal area shall be 71.3 in² plus or minus 1%.
 - d. Nominal depth shall be 6 inches.
- D. Strip Properties and Assembly
 - 1. Perforated Textured Strip/Cell
 - a. Strip sheet thickness shall be 50 mil (1.27 mm), minus 5 percent, plus 10 percent in accordance with ASTM D 5199. Determine thickness flat, before surface disruption.
 - b. Polyethylene strips shall be textured surface with a multitude of rhomboidal (diamond shape) indentations.
 - c. Textured sheet thickness shall be 60 mil plus or minus 6 mil.
 - d. Indentation surface density shall be 140 to 200 per in².
 - e. Perforated with horizontal rows of 0.4 inch diameter holes.
 - f. Perforations within each row shall be 0.75 inches on-center.
 - g. Horizontal rows shall be staggered and separated 0.50 inches relative to hole centers.
 - h. Edge of strip to nearest edge of perforation shall be a minimum of 0.3 inches.
 - i. Centerline of spot weld to nearest edge of perforation shall be a minimum of 0.7 inches.

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- j. A slot with a dimension of 3/8 inch x 1-3/8 inch is standard in the center of the non-perforated areas and at the center of each weld.
 - 2. Assembly of Cell Sections
 - a. Fabricate using strips of sheet polyethylene each with a length of 142 inches and a width equal to cell depth.
 - b. Connect strips using full depth ultrasonic spot-welds aligned perpendicular to the longitudinal axis of strip.
 - c. Ultrasonic weld melt-pool width shall be 1.0 inch maximum.
 - d. Weld spacing for Geocell sections shall be 17.5 inches plus or minus 0.10 inch.
 - E. Cell Seam Strength Tests
 - 1. Minimum seam strengths are required by design and shall be reported in test results. Materials submitted with average or typical values will not be accepted. Written certification of minimum strengths must be supplied to the engineer at the time of submittals.
 - 2. Short-Term Seam Peel-Strength Test.
 - a. Cell seam strength shall be uniform over full depth of cell.
 - b. Minimum seam peel strength shall be 480 lbf for 6 inch depth.
 - 3. Long-Term Seam Peel-Strength Test.
 - a. Conditions: Minimum of 7 days in a temperature-controlled environment that undergoes change on a 1 hour cycle from room temperature to 130 degrees F.
 - b. Room temperature shall be in accordance with ASTM E41.
 - c. Test samples shall consist of two, four-inch (100 mm) wide strips welded together.
 - d. Test sample consisting of two carbon black stabilized strips shall support a 160-pound load for test period.
 - 4. Internal Junction Efficiency.
 - a. Junction efficiency determined as a ratio of junction performance to perforated strip performance, as determined by EN ISO 10319 and EN ISO 13426-1.
 - b. Minimum internal junction efficiency shall be ≥ 100 percent.
 - 5. Mechanical Junction Efficiency
 - a. Junction efficiency determined as a ratio of junction performance to perforated strip performance, as determined by EN ISO 10319 and EN ISO 13426-1.
 - b. Minimum mechanical junction efficiency shall be ≥ 100 percent.
 - c. Connection type shall be with integral components as designated by the Manufacturer.
 - 6. 10,000-hour Seam Peel Strength Certification
 - a. Manufacturer shall provide data showing that the high-density polyethylene resin used to produce the cellular confinement system sections has been tested using an appropriate number of seam samples and varying loads to generate data indicating that the seam peel strength shall survive a loading of at least 209 lbf for a minimum of 10,000 hours.

2.2 INTEGRAL COMPONENTS

- A. Stake Clip
 - 1. The Stake Clip is molded, high-strength polyethylene device available in standard (0.5 inch) version.

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2. Stake Clips can be installed as an end cap on standard (0.5 inch) steel reinforcing rods to form anchors.
- B. Key
1. Keys shall be constructed of polyethylene and provide a high strength connection with minimum pull-through of 275 lbs.
 2. Keys shall be used to connect sections together at each interleaf and end-to-end connection.
 3. Metal staples and zip ties are not allowed.

2.3 STAKE ANCHORAGE

- A. Anchors
1. Anchors shall consist of standard (0.5 inch) steel reinforcing rod with a Stake Clip attached as an end cap.
 2. Anchors shall be assembled by inserting the Stake Clip onto the reinforcing rod so that the end is flush with the top of the Stake Clip. Prior to attaching the Stake Clip, the reinforcing rod shall be beveled and free from all burrs.
 3. The anchor length and placement shall be as shown in the Contract Documents.

2.4 CELL INFILL MATERIALS

- A. Cell infill material shall be Franklin Red gravel, crushed aggregate or stone with a maximum particle size of one-third cell depth.
- B. Infill material shall be free of any foreign material.
- C. Clays and silts are not acceptable infill material.
- D. Infill material shall be free-flowing and not frozen when placed in the cellular confinement system panels.

2.5 ADDITIONAL COMPONENTS

- A. Surface Protection.
1. Surface protection shall consist of cement grout as specified in the Contract Documents.
- B. Geotextile
1. The geotextile separation layer shall be as specified in the Contract Documents.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify site conditions are as indicated on the drawings. Notify the Engineer if site conditions are not acceptable. Do not begin preparation or installation until unacceptable conditions have been corrected.
- B. Verify layout of structure is as indicated on the drawings. Notify the Engineer if layout of structure is not acceptable. Do not begin preparation or installation until unacceptable conditions have been corrected.

3.2 INSTALLATION OF THE CHANNEL PROTECTION SYSTEM

- A. Prepare sub grade and install protection system in accordance with Manufacturer's recommendations.
- B. On-site time for installation assistance by the Manufacturer's field representative shall be 1 day with one trip. All travel and expense costs for Manufacturer's field representative installation assistance shall be included in the base bid price.
- C. Sub Grade Preparation:
 - 1. Excavate or fill foundation soils so top of installed section is flush with or slightly lower than adjacent terrain or final grade as indicated on the drawings or as directed by the Engineer.
 - 2. Install geotextile separation layer on prepared surfaces ensuring required overlaps are maintained and outer edges of geotextile are buried in accordance with the Manufacturer's recommendations.
- D. Section Anchorage
 - 1. Anchorage requirements for the sections shall be as shown on the Contract Documents and as directed by the Engineer.
 - 2. Anchorage with Anchors
 - a. Position collapsed sections at the crest of the slope.
 - b. If required, excavate the anchor trench at the top of the slope to the depth as shown on the Contract Documents.
 - c. Drive anchors at the crest of the slope to secure the sections in place and allow expansion of the sections into position.
 - d. After the sections are expanded as desired, drive Anchors so the arm of the Stake Clip engages with the top of the cell wall.
 - e. Anchorage pattern and stake length shall be as indicated on the Contract Documents.
 - f. Fill the anchorage trench with the specified material and compact as required by the Contract Documents.
- E. Section Placement and Connection
 - 1. Verify all sections are expanded uniformly to required dimensions and that outer cells of each section are correctly aligned. Interleaf or overlap edges of adjacent sections. Ensure upper surfaces of adjoining sections are flush at joint and adjoining cells are fully aligned at the cell wall slot.
 - 2. Connect the sections with keys at each interleaf and end-to-end connection. Insert the key through the cell wall I-slot before inserting through the adjacent cell. Turn the key 90 degrees to lock the sections together.
- F. Aggregate Infill Placement
 - 1. Place specified infill in expanded cells with suitable material handling equipment, such as a backhoe, front-end loader, conveyor, or crane-mounted skip.
 - 2. Limit drop height to a maximum of 3 feet to prevent panel distortion.
 - 3. Fill sections from the crest of the slope to toe or in accordance with Engineer's direction.
 - 4. Infill material shall be free-flowing and not frozen when placed into the sections.
 - 5. Evenly spread infill and ensure the infill is flush with the cell walls.
- G. Surface Treatment
 - 1. Surface protection shall be installed immediately after placement of the infill material and secured per the Manufacturer's instructions.

END OF SECTION

SECTION 31 36 00 – HIGH ABRASION RESISTANT POLYMER COATED GABIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes furnishing, assembling, filling, and tying double twist woven wire mesh gabions placed on a prepared surface as specified, and in accordance with the lines, grades, and dimensions shown on plans or otherwise established in the field by project engineer.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM A90/A90M - Test Method for Weight [Mass] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings
 - 2. ASTM A370 - Test Methods and Definitions for Mechanical Testing of Steel Products
 - 3. ASTM A428/A428M - Test Method for Weight [Mass] of Coating on Aluminum-Coated Iron or Steel Articles
 - 4. ASTM A764 - Specification for Metallic Coated Carbon Steel Wire, Coated at Size and Drawn to Size for Mechanical Springs
 - 5. ASTM A641/A641M - Specification for Zinc-Coated (Galvanized) Carbon Steel Wire
 - 6. ASTM A902 - Terminology Relating to Metallic Coated Steel Products
 - 7. ASTM A975 - Standard Specification for Double-Twisted Hexagonal Mesh Gabions and Revet Mattresses (Metallic-Coated Steel Wire or Metallic-Coated Steel Wire with Poly Vinyl Chloride (PVC) Coating)
 - 8. ASTM B117 - Practice for Operating Salt Spray (Fog) Apparatus
 - 9. ASTM D6711 - Standard Practice for Specifying Rock to Fill Gabions, Revet Mattresses, and Gabion Mattresses
- B. American Association of State Highway and Transportation Officials:
 - 1. AASHTO M288 - Standard Specification for Geosynthetic Specification for Highway Applications
- C. European Committee for Standards – Electrical:
 - 1. EN 10245-1 - Steel wire and wire products - Organic coatings on steel wire – Part 1: General Rules
 - 2. EN 60229:2008 - Electric Cables – Tests on Extruded Oversheaths with a Special Protective Function
- D. International Organization for Standardization:
 - 1. ISO 4892-3 - Plastics – Methods of Exposure to Laboratory Light Sources – Part 3: Fluorescent UV Lamps

1.3 DEFINITIONS

- A. Gabion
 - 1. Gabion is a double twisted wire mesh container of variable sizes, uniformly partitioned into internal cells by diaphragms positioned approximately 3 ft (0.9m) centers, interconnected with other similar units and filled with stone at the project site to form flexible, permeable, monolithic structures such as retaining walls, sea walls, channel linings, revetments, and weirs for erosion control application. Definitions of terms specific to this specification and to all materials furnished on the jobsite, except for the

rock to fill the baskets and the geotextile, shall refer and be in compliance with ASTM A975.

1.4 FABRICATION

- A. Gabions shall be manufactured and shipped with all components mechanically connected at the production facility. The front, base, back and lid of the gabions shall be woven into a single unit. The ends and diaphragm(s) shall be factory connected to the base. All perimeter edges of the mesh forming the basket and top, or lid, shall be selvedged with wire having a larger diameter. The gabion is divided into cells by means of diaphragms positioned at approximately 3 ft centers. The diaphragms shall be secured in position to the base so that no additional lacing is necessary at the jobsite.

1.5 SUBMITTALS

- A. Submit the following list of items for Engineer's review and approval prior to material supply.
 - 1. Manufacturer's product technical specifications, and product installation instructions.
 - 2. Wire mesh sample with edge and selvedge wires. Minimum sample size shall be 12 in. by 12 in.
 - 3. Written manufacturer's certificate of compliance. Manufacturer's Certificate of Compliance shall be signed by person authorized to bind the manufacturer's certifications and must have Manufacturer's name and product manufacturing location.

1.6 QUALITY ASSURANCE

- A. Wire and Ring Fastener
 - 1. The owner or owner's representative reserves the right to test additional samples to verify the submitted test records. For equivalent products, furnish a minimum of three randomly selected field samples of lacing wire and ring fasteners 60 days prior to start of installation. Samples shall be tested to verify the following property requirements in accordance with ASTM A975.
 - a. Wire thickness.
 - b. Tensile strength.
 - c. High abrasion resistant (HAR) polymer coating thickness.
 - d. Ring fastener individual pull apart strength.
- B. Installation
 - 1. The General Contractor shall have personals with at least 3 years of experience installing gabions and have installed a minimum of 1000CY of gabions in each of the last three years. In case the General Contractor does not meet the qualifications based on the above requirements, acquire necessary onsite training from manufacturer prior to construction or the services of a qualified gabion/mattress subcontractor must be utilized. A manufacturer's representative shall provide reasonable installation support.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Gabions shall be delivered with all components mechanically connected at the production facility. All gabions are supplied in the collapsed form, either folded or bundled for shipping. Bundles are banded together at the factory for ease of shipping and handling. Deliver gabions to the jobsite labeled in bundles. Labels show the dimensions of the gabions included the number of pieces and the color code. Lacing wire shall be shipped in coils, fasteners in boxes and preformed stiffeners in bundles.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. High Abrasion Resistant (HAR) Polymer Coated Gabions.
 - 1. Double twisted wire mesh gabions shall be manufactured with a non-raveling mesh made by twisting continuous pairs of wires through three half turns (commonly called double twisted) to form a hexagonal-shaped opening. Gabion sizes, wire diameters, mesh opening sizes, and tolerances shall comply with the requirements of ASTM A975. Gabions are classified according to the wire coating, which is applied prior to manufacturing the mesh. HAR polymer coated gabions are manufactured from a heavily zinc coated soft or medium temper steel and overcoated with high abrasion resistant polymer as per ASTM A975. Wire and wire mesh used for manufacturing gabions shall meet the following requirements:
 - a. Wire tensile strength.
 - 1) The wire used for the manufacturing gabions and lacing wire, shall have a minimum tensile strength of 60,000 psi (415 MPa) to maximum tensile strength of 80,000 psi (550 MPa), in accordance with ASTM A641/A641M.
 - b. Elongation
 - 1) The test shall be carried out on a sample at least 12 in. (300 mm) long, and the elongation shall not be less than 12 percent, in accordance with ASTM A370.
 - c. Metallic (Zinc) Coating
 - 1) The minimum quantities of zinc shall be according to the ASTM A641/A641M, Class III soft or medium temper coating.
 - d. Adherence of zinc coating
 - 1) The adherence of the zinc coating to the wire shall be such that, when the wire is wrapped six turns around a mandrel having four times the diameter of the wire, it does not flake or crack when rubbing it with the bare fingers, in accordance with ASTM A641/A641M.
 - e. HAR polymer coating
 - 1) HAR polymer coating is an environmentally safe extruded polymer coating specifically developed to provide high resistance to abrasion and mechanical damage to improve its performance in cold and hot temperatures and UV radiation.

The technical characteristics and ageing resistance of the HAR polymer coating comply with ASTM A975.

 - (a) Color: Gray
 - (b) Resistance to UV radiation: the tensile strength and elongation at break of the base compound after 2500 hours of exposure to QUV-

A (ASTM G154 or ISO 4892-3 mode 1) do not change more than 25% from the initial test results.

- (c) Brittleness temperature: the brittleness temperature of HAR polymer coating shall be less than -35°C (-31°F) as determined with ASTM D746.
- (d) Outwearing accelerated ageing test in salt spray: when the HAR polymer coated wire mesh is subjected to the neutral salt spray test (ASTM B117 or ISO 9227) after 6000 hours of exposure the mesh does not show more than 5% of DBR (Dark Brown Rust).
- (e) Resistance to abrasion: Abrasion is prominent where there is scuffing, scratching, or wearing action caused by actions such as glaciation, suspended solid transport in rivers, or waves breaking on coastlines. The abrasion resistance of the HAR polymer coating shall comply with ASTM A975. The average number of cycles caused by linear abrading action shall be greater than 300.
- (f) Corrosion spread maximum length of corrosion spread on a HAR polymer coated wire shall be less than a mesh opening after immersion in a 5% solution of HCl as per ASTM A975.

f. Standard Wire Diameters

- 1) Wire diameters shall comply with ASTM A975 as presented in Table 1.

Table 1 Standard Wire Diameters			
	Lacing Wire, Cross tie/Stiffener wire	Mesh Wire	Selvedge Wire/Preformed Stiffeners
Wire Diameter Int \varnothing in (mm)	0.087 (2.20)	0.106 (2.70)	0.134 (3.40)
Wire Tolerance (\pm) \varnothing in (mm)	0.004 (0.10)	0.004 (0.10)	0.004 (0.10)
Min. Zinc Qty. oz/ft ² (g/m ²)	0.70 (214)	0.8 (244)	0.85 (259)
Wire + Polymer Diameter in. (mm)	0.127 (3.20)	0.146 (3.70)	0.174 (4.40)

g. Mesh Characteristics and Strength Requirements

- 1) The wire mesh characteristics and minimum strength requirements shall be in accordance with ASTM A975 as presented in Table 2. The tolerances on the hexagonal double twisted wire mesh opening, D (see Fig. 1), shall not exceed $\pm 10\%$.

Table 2 Mesh Characteristics and Minimum Strength	
Mesh Type	8x10/ HAR Polymer Coated
Mesh Opening, D	3.25 in. (83 mm)
Mesh Tensile Strength	3425 lb/ft (50.0 kN/m)
Punch Test Resistance	5300 lb (23.6 kN)
Connection Strength	1200 lb/ft (17.5 kN/m)

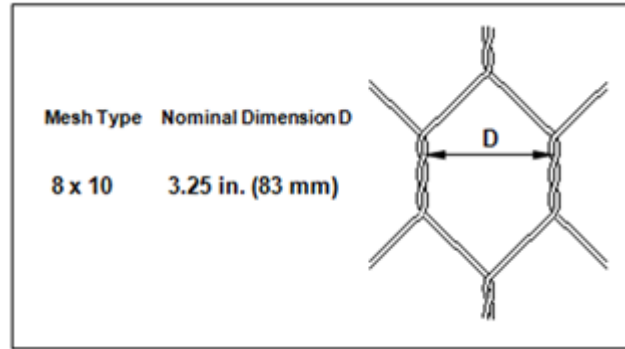


Fig. 1 Mesh type and opening

- h. Standard gabion sizes are listed in Table 3. All sizes and dimensions are nominal. The tolerances on width, length and height of baskets shall not exceed $\pm 5\%$.

L=Length ft (m)	W=Width ft (m)	H=Height ft (m)	# of cells
6 (1.83)	3 (0.91)	3 (0.91)	2
9 (2.74)	3 (0.91)	3 (0.91)	3
12 (3.66)	3 (0.91)	3 (0.91)	4
6 (1.83)	3 (0.91)	1.5 (0.45)	2
9 (2.74)	3 (0.91)	1.5 (0.45)	3
12 (3.66)	3 (0.91)	1.5 (0.45)	4
6 (1.83)	3 (0.91)	1 (0.3)	2
9 (2.74)	3 (0.91)	1 (0.3)	3
12 (3.66)	3 (0.91)	1 (0.3)	4
4.5 (1.37)	3 (0.91)	3 (0.91)	1

B. Ring Fasteners

1. Stainless steel rings for HAR polymer coated gabions shall be in accordance with ASTM A975 section 6.3. The ring fasteners properties shall be as presented in Table 4.

Property	Value	Test Method
Wire diameter	0.120 in. (3.05 mm)	ASTM A313, Type 302, Class I
Wire tensile strength	222,000 to 253,000 psi (1530 to 1744 MPa)	ASTM A313, Table 5

C. Stone Fill

1. Properties
 - a. Rocks shall be hard, angular to round, durable and of such quality that they shall not disintegrate on exposure to water or weathering during the life of the structure.
2. Gradation
 - a. The rock used to fill gabions shall be large enough to prevent individual pieces from passing through the mesh openings. Gabion rocks shall range between 4 in. and 8 in. The range in sizes shall allow for a variation of 5% oversize and/or 5% undersize rock by weight. In all cases, the sizes of any oversize rock shall allow for the placement of three or more layers of rock within each gabion compartment. In all cases, undersize rock shall be placed within the interior of

-
- the gabion compartment and shall not be placed on the exposed surface of the structure.
3. Source
 - a. Rock may be naturally available or crushed rock produced by any suitable method and using any device that yields the required size limits. Alternatively, clean crushed concrete can be used to fill the gabions.
 4. Geotextile
 - a. Separation geotextile used behind, or underneath gabions shall meet AASHTO M288 and/or project specification requirements.

PART 3 - EXECUTION

3.1 FOUNDATION PREPARATION

- A. The foundation for gabion wall shall be graded level for a width equal as shown in the project plans. Prior to beginning the wall construction, the area under the wall footprint should be prepared and compacted. Any soft or loose material that is encountered should be compacted or removed and replaced. Any debris that will obstruct the proper installation shall also be removed, and the voids carefully backfilled and compacted. If frozen ground conditions are encountered, contact project geotechnical engineer for further recommendations.

3.2 GEOTEXTILE PLACEMENT

- A. Geotextile shall be placed uniformly on the surface as indicated on the drawings or as directed by the project engineer. Place the geotextile in close contact with the soil, eliminating folds or excessive wrinkles both longitudinally and transversely. The geotextile shall be installed with adequate overlap. The minimum overlap distance in the transverse or longitudinal direction is 2.0 ft (0.6 m), except in underwater installations where the minimum overlap is 3.0 ft (1.0 m). It is recommended that traffic not run-on exposed geotextile.

3.3 ASSEMBLY

- A. Gabions are supplied folded flat and packed in bundles. The units shall be opened and unfolded one by one on a flat, hard surface and remove any shipping folds. This can be done by placing the fold over a 2 in. x 4 in. (50 mm x 100 mm) board and walking along the sides. The sides, ends, and diaphragms shall be lifted into a vertical position to form an open box shape. The back and the front panels of the gabion shall be connected to the end panels and center diaphragms using either lacing wire or ring fasteners. The end panels and the diaphragms shall be raised to a vertical position and the selvedge wire shall be wrapped around the edge wire of the top and back panels. Fig. 2 shows unfolded and assembled double twisted wire mesh gabions.

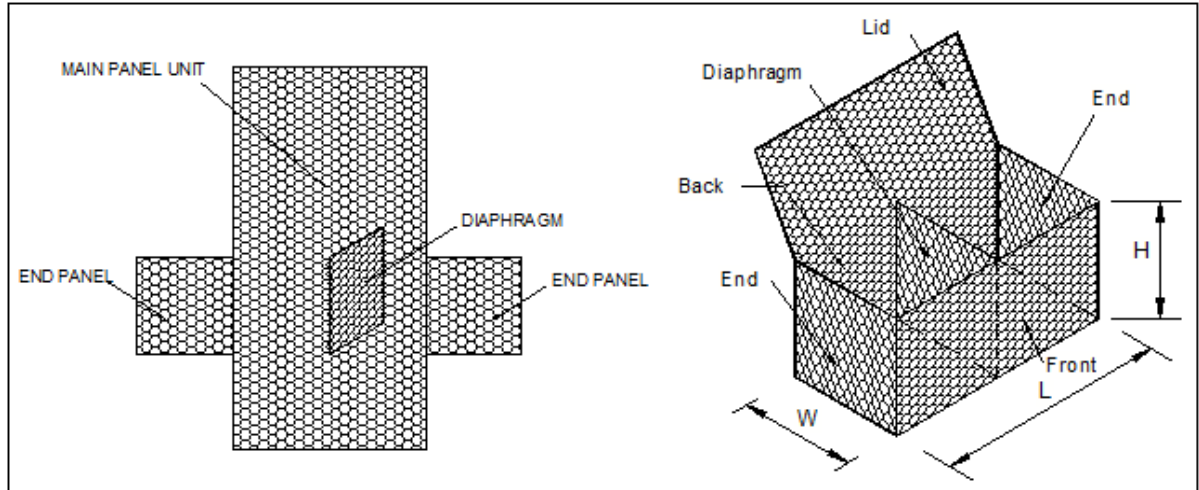


Fig. 2 Unfolded and assembled double twisted wire mesh Gabion

3.4 FASTENING PROCEDURES

A. Lacing Wire

1. When using lacing wire, cut a piece of wire approximately 1.5 times the length of the edge to be laced. Longer edges shall be connected by several lengths of lacing wire. The mesh panels shall be pulled tightly together during the tying operation. For vertical joints, starting at the bottom end of the panel, the lacing wire shall be twisted and wrapped two times around the bottom selvedge and then double and single loops shall be alternated through at intervals not exceeding 6 in. (150 mm) as shown in Fig. 3. The operation shall be finished by looping around the top selvedge wire. The use of pliers to assemble the units with lacing wire is recommended to create tighter joints.

B. Ring Fasteners

1. When ring fasteners are used to connect gabion panels, spacing of the rings shall be in accordance with ASTM A975, minimum strength requirements of mesh and connections. In any case, the maximum ring spacing along the edges shall not exceed 4 in. (100 mm) as shown in Fig. 3. Ring fasteners shall be installed at the end, diaphragms and along the edges. Each ring fastener shall be closed, and the free ends of the fastener shall overlap a minimum of 1 in. (25 mm) as shown in Fig 3. The use of either a mechanical or a pneumatic fastening tool is required to install ring fasteners.

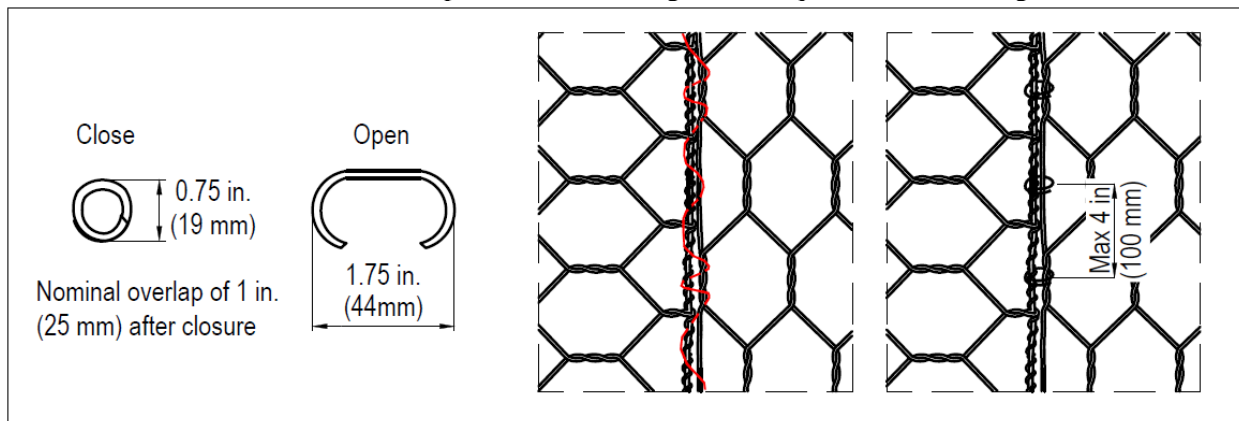


Fig. 3 Fastening procedures

3.5 INSTALLATION AND FILLING

- A. Empty gabion units shall be assembled individually and placed on the approved surface to the lines and grades as shown or as directed by the project engineer. Gabions shall be connected to each other and aligned before filling the baskets with rock. All connections (panel-to-panel) and basket-to-basket shall be already carried out as described in ASSEMBLY section above. To avoid local deformation, gabion rocks shall be placed in lifts under which no cell shall be filled to a depth exceeding 1 ft at a time (see Fig. 4). The fill layer should never be more than 1 ft higher than any adjoining cell as shown in Fig. 4. During the filling, some manual stone placement is required to minimize voids. Rocks on the exposed faces of vertical gabion structures shall be carefully hand placed to give a neat, smooth and compact appearance. Gabions shall be uniformly overfilled by about 1 to 1.5 in. to compensate for future rock movement.

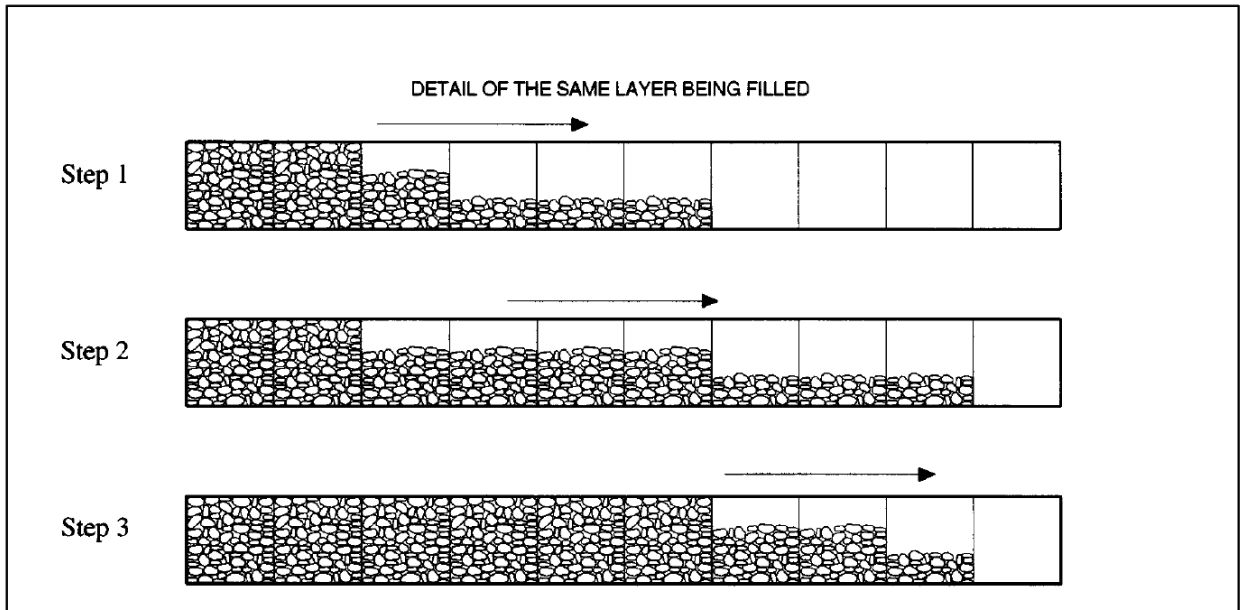


Fig. 4 Gabion rock filling

- B. Lacing wire stiffeners or preformed U-shaped stiffeners shall be installed in all front and side of the gabions at 1/3 and 2/3 of the height for 3 ft (1 m) and in the center of the cells, as the cell is being filled. In 1.5 ft (0.5 m) high units, stiffeners shall be installed at the half height level. For 1 ft (0.3 m) or 1.5 ft (0.5 m) high baskets when used as revetment, stiffeners are not required. Preformed corner stiffeners shall be installed at 45° to the face or side of the basket, extending an equal distance along each of the side being braced (approximately 1 ft (0.3 m)). Stiffeners shall be installed only in a gabion cell that will be exposed or unsupported after the structure is completed. When more than one layer of gabions is required to form a monolithic structure, the next layer of gabions shall be connected to the layer underneath after this layer has been securely closed.

3.6 CLOSING

- A. Lids shall be tightly secured along all edges, ends and diaphragms in the same manner as described for assembling. The panel edges shall be pulled and connected with the lid using the

appropriate closing tools such as lid closer, where necessary. Adjacent lids shall be securely attached simultaneously, and all end wires shall then be turned in to avoid protrusions.

3.7 NON-RECTANGULAR SHAPES AND SPECIAL ADAPTATION

- A. Where a complete gabion cannot be installed because of space limitations, the gabion shall be cut, folded or overlapped, and securely connected to suit existing site conditions. All modified gabions shall form a closed cell when completed. Gabion units can conform to bends up to a radius of curvature of 60 to 70 ft (18 to 21 m) without alterations. Units shall be securely connected to each other first, and be placed to the required curvature, holding them in position by staking the units to the ground with hardwood pegs before filling.

3.8 MAINTENANCE

- A. No routine maintenance is required. Severely damaged gabions shall be completely removed and replaced. If the damage is localized in the fascia, the gabions can be repaired by filling the voids (if any) with rock and patching it using a new piece of double twisted wire mesh. The new piece of wire mesh shall be connected to undamaged mesh with a minimum overlap of 9 to 12 inches using lacing wire or fasteners.

END OF SECTION

SECTION 31 37 00 – RIPRAP

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes construction of loose rock riprap revetments and blankets, including geotextile filter layers or bedding where specified or indicated.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.
 - 2. Section 31 23 16 “Excavation.”

1.2 SUBMITTALS

- A. Provide gradation curves for riprap to be used prior to any rock delivery.
- B. Laboratory test results for bulk specific gravity, absorption, and sodium sulfate soundness at least 30 days prior to delivery of any rock.
- C. Name and location of rock source.
- D. Submit a sample of filter cloth and manufacturer’s certification that it meets requirements of this Specification.

1.3 REFERENCES

- A. ASTM C88 - Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
- B. ASTM C127 - Standard Test Method for Specific Gravity and Absorption of Course Aggregate (as modified in this Specification Section).
- C. ASTM D3786 - Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics: Diaphragm Bursting Strength Tester Method.
- D. ASTM D4354 - Sampling of Geosynthetics for Testing.
- E. ASTM D4355 - Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus).
- F. ASTM D4491 - Water Permeability of Geotextiles by Permittivity.
- G. ASTM D4533 - Trapezoid Tearing Strength of Geotextiles.
- H. ASTM D4632 - Grab Breaking Load and Elongation of Geotextiles.
- I. ASTM D4751 - Determining Apparent Opening Size of a Geotextile.
- J. ASTM D4759 - Determining the Specification Conformance of Geosynthetics.
- K. ASTM D4833 - Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products.
- L. ASTM D4873 - Identification, Storage, and Handling of Geosynthetic Rolls.
- M. TEX 735-I - Sampling Construction Fabrics.
- N. TEX 616-J - Testing Construction Fabrics.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Rock for loose rock riprap shall conform to requirements of TxDOT Standard Specifications Items 432 Riprap 432.1 and 591S standard riprap gradations under high

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- turbulent flow. The rock shall be placed 4 inches embedded into the soil. Size of rock shall be 12-inch-nominal diameter.
- B. Rock from designated sources shall be excavated, selected, and handled as necessary to meet the quality and grading requirements of this Specification. The rock shall conform to the specified grading limits when installed.
- C. Rock riprap shall be excavated, selected, and handled as necessary to meet the quality and grading requirements specified. Individual rock fragments shall be dense, sound, and free from cracks, seams, and other defects conducive to accelerated weathering. Rock fragments shall be angular to subrounded in shape. The least dimension of an individual rock fragment shall not be less than 1/3 the greatest dimension of the fragment.
- D. Rock riprap shall have the following properties:
1. Bulk specific gravity (saturated surface-dry basis) not less than 2.5 when tested in accordance with ASTM C127.
 2. Absorption not more than 2 percent when tested in accordance with ASTM C127.
 3. Weight loss in five cycles not more than 10 percent when sodium sulfate is used or 15 percent when magnesium sulfate is used when tested in accordance with ASTM C88 modified as follows:
 - a. Test sample shall not be separated into fractions. It shall consist of 5,000 ±300 grams of rock fragments, reasonably uniform in size and shape and weighing approximately 100 grams each, obtained by breaking the rock and selecting fragments of the required size.
 - b. After sample dries, following completion of the final test cycle and washing to remove the sodium sulfate or magnesium sulfate, the loss of weight shall be determined by subtracting from the original weight of the sample the final weight of all fragments that have not broken into three or more pieces.
 - c. The report shall show the percentage loss of weight, list the sulfate solution used, and list the results of the qualitative examination.
- E. Geotextile:
1. Geotextile shall conform to Texas Department of Transportation Geotextile Performance Requirements (Type 2) nonwoven, or approved equal, typical equivalent sieve opening equal to 100.
 2. Fabric shall be constructed exclusively of manmade thermoplastic fibers, nonwoven geotextile fabric, and form a mat of uniform quality.
 3. Fabric fibers may be continuous and oriented in a random pattern throughout fabric.
 4. Fabric shall be mildew resistant, rot-proof, and satisfactory for use in a wet soil and aggregate environment.
 5. Packaging Requirements:
 - a. Fabric shall be packaged in rolls of the length and width specified.
 - b. Fabric itself shall be uniformly wound onto suitable cylindrical forms or cores to aid in handling and unrolling.
 - c. Each roll of fabric and form/core upon which it is rolled shall be packaged individually in a suitable sheath, wrapper, or container to protect geotextile from damage due to ultraviolet light and moisture during normal storage and handling.
- F. Bedding shall be obtained from designated sources and selected to meet quality and grading requirements of this Specification.
- G. At least 30 days before changing source of approved rock riprap, Contractor shall notify Engineer in writing of new sources he intends to obtain material. Contractor shall submit gradation, tests, and source name and location required in Article 1.3 and receive Engineer approval prior to delivery of any material from new source. Failure to obtain approval will result in rejection of the source and any material delivered.

PART 3 - EXECUTION

3.1 SUBGRADE PREPARATION

- A. The subgrade surfaces on which the riprap and filter fabric are to be placed shall be cut or filled and graded to the lines and grades shown on the Drawings. When fill to subgrade lines is required, it shall consist of approved materials and shall conform to the requirements of the specified class of fill. Subgrade shall be compacted to 95-percent density, according to ASTM D1557, for a depth of 6 inches.
- B. Riprap shall not be placed until the foundation preparation is completed and subgrade surfaces have been inspected and approved by Engineer.

3.2 ROCK RIPRAP SAMPLE

- A. Prior to delivery of rock riprap for incorporation into the proposed works of improvement, Contractor shall provide a sample load of rock weighing at least 10 tons from rock source and in gradation specified. Deposit rock sample on construction or stockpile site at a location designated by Engineer and maintain at this location until Engineer releases it for inclusion into construction. This sample shall be used as a source of reference for judging gradation of riprap delivered to Project. Any difference of opinion between Engineer and Contractor concerning gradation of riprap delivered to Project shall be resolved by dumping and checking gradation of one random truckload of riprap. If additional checking procedure becomes necessary, mechanical equipment, preparation of sorting site, and labor needed to prove gradation by weighing shall be provided by Contractor at no additional compensation. If, when rock is delivered to construction site, separation or segregation of smaller rock fraction from larger rock fraction occurred, rework rock as necessary to insure a reasonably uniform distribution of various rock sizes prior to placement of rock. Due care shall be exercised during this reworking operation (if required) to prevent inclusion of earth or other undesirable materials in riprap. Near end of placement of rock riprap on the Project, sample load of rock may be incorporated into proposed works of improvement at riprap locations indicated once Engineer releases it. Due care shall be exercised to prevent inclusion of earth or other undesirable materials in riprap.

3.3 EQUIPMENT-PLACED ROCK RIPRAP

- A. The rock shall be placed by equipment on the surfaces and to the depths specified. The riprap 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 rock shall be delivered and placed in a manner that will ensure that the riprap in place shall be reasonably homogeneous with the larger rocks uniformly distributed and firmly in contact one to another with the smaller rocks and spalls filling the voids between the larger rocks.
- B. Riprap shall be placed in a manner to prevent damage to structures. Hand placing will be required to the extent necessary to prevent damage to the permanent works and achieve uniform distribution of the rock's gradation.
- C. Place riprap so underlying geotextile is not punctured or otherwise damaged or displaced.
- D. The uppermost surface of the riprap layer will be comprised mostly of the largest, heaviest rock to discourage vandalism associated with the smaller, hand-movable rock.

3.4 HAND-PLACED RIPRAP

- A. The rock shall be placed by hand on the surfaces and to the depths specified. It shall be securely bedded with the larger rocks firmly in contact with one to another. Spaces

between the larger rocks shall be filled with smaller rocks and spalls. Smaller rocks shall not be grouped as a substitute for larger rock. Flat slab rock shall be laid on edge.

- B. Place hand-placed riprap so underlying geotextile is not punctured or otherwise damaged or displaced.
- C. The uppermost surface of the riprap layer will be comprised mostly of the largest, heaviest rock to discourage vandalism associated with the smaller, hand-movable rock.

3.5 GEOTEXTILE

- A. Where Drawings specify geotextile, filter material shall be spread uniformly on prepared subgrade surfaces.
- B. Sampling and Testing Requirements:
 - 1. Samples for testing purposes shall be taken per Test Method "Tex-735-I, Sampling Construction Fabrics."
 - 2. Testing shall be per appropriate ASTM or Test Method "Tex-616-J, Testing Construction Fabrics."
- C. Basis for Rejection:
 - 1. Should any individual sample selected at random from 100 rolls, or fraction thereof, fail to meet any specification requirement, that roll shall be rejected and two additional samples taken, one from each of two other additional rolls selected at random from same 100-roll lot, or fraction thereof.
 - 2. If either of additional samples fail to comply with any portion of specification, entire quantity of rolls represented by that sample shall be rejected.
- D. Installation:
 - 1. Subgrade Preparation: Surface underlying geotextile shall be smooth and free of ruts or protrusions which could damage geotextile. Subgrade materials and compaction requirements shall be per Section 31 23 16 "Excavation."
 - 2. Placement: Contractor shall request Engineer presence during handling and installation. Geotextile rolls damaged or contain imperfections shall be repaired or replaced as directed. Geotextile shall be laid flat and smooth so that it is in direct contact with the subgrade. The geotextile shall also be free of tensile stresses, folds, and wrinkles. On slopes greater than 5 horizontal on 1 vertical, the geotextile shall be laid with the machine direction of the fabric parallel to the slope direction.
 - 3. Geotextile panels shall be continuously overlapped a minimum of 12 inches. Where it is required that seams be oriented across slope, the upper panel shall be lapped over lower panel. Contractor has the option of field sewing instead of overlapping.
 - 4. All filter cloth/concrete interfaces shall be made secure with adhesive. The adhesive shall not be injurious to either the concrete surface or the geotextile, and shall be continuous throughout the interface, both horizontally and vertically.
 - 5. Seams shall be continuously sewn at the locations shown on the Drawings. A flat seam with one row of a two-thread chain stitch shall be used unless otherwise recommended by the manufacturer. Minimum distance from geotextile edge to stitch line nearest to that edge shall be 3 inches unless otherwise recommended by manufacturer. Quality assurance samples shall be taken at Engineer request. Thread at the end of each seam run shall be tied off to prevent unraveling. Seams shall be on the top side of the geotextile to allow inspection. Skipped stitches or discontinuities shall be sewn with an extra line of stitching with a minimum of 18 inches of overlap.
 - 6. The geotextile shall be protected during installation from clogging, tears, and other damage. Damaged geotextile shall be repaired or replaced as directed. Adequate ballast (e.g., sand bags) shall be used to prevent uplift by wind. The geotextile shall not be left uncovered for more than 14 days during installation.

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7. Geotextile damaged during installation shall be repaired by placing a patch of the same type of geotextile which extends a minimum of 12 inches beyond edge of damage or defect. Patches shall be continuously fastened using a sewn seam or other approved method. Machine direction of the patch shall be aligned with the machine direction of the geotextile being repaired. Geotextile which cannot be repaired shall be replaced.
 8. Geotextile shall not be covered prior to approval by Engineer. Contractor shall request Engineer presence during covering of the geotextile. On side slopes, riprap shall be placed from the bottom of the slope upward. No equipment shall be operated directly on top of the geotextile. Low ground pressure vehicles (all terrain vehicles (ATVs)) may be operated directly on top of the geotextile if approved by Engineer. If ATVs are allowed to operate on top of the geotextile, they shall move at a rate of speed not exceeding 8 km/hour, travel in straight lines or large arcs, not start or brake abruptly, and not turn sharply. Refueling of ATVs shall not be performed on top of the geotextile.

3.6 TESTING

- A. Contractor will notify Owner's testing lab to perform such tests as deemed necessary to verify that the riprap, filter, and bedding materials and the completed Work meet the requirements of the Specifications. Owner's testing lab will perform confirmation tests. These confirmation tests are intended to provide Contractor with the information he needs to assure that the materials and workmanship meet the requirements of Specifications. Contractor shall provide access to the materials and workmanship so Owner testing lab may take samples for testing purposes.

END OF SECTION

SECTION 31 41 10 - TRENCH SAFETY SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes trench safety systems for trench excavations greater than 5 feet in depth. All Work performed herein shall also comply with OSHA Part 1926, Subpart P, state, and local codes. Contractor responsible for complying with requirements of Specifications, Drawings, and all applicable codes. Contractor shall immediately notify Engineer of the integrities seen field conditions which might affect integrity of trench safety system.
- B. Scope:
 - 1. Trench and excavation safety systems by cut-back or braced-excavation method for all trenches 5 feet and deeper whether indicated on Drawings or required by actual field conditions. Trenches not exceeding 5 feet in depth protected as required by OSHA, state, and local standards.
 - 2. Alternative methods of trench safety may be submitted for approval to Engineer; however, alternative methods will not be reviewed or reviewed prior to bid opening.
 - 3. Contractor holds responsibility to adhere to latest version from OSHA.
- C. Related Requirements:
 - 1. Division 01 Specifications Sections apply to Work of this Section.

1.2 SUBMITTALS

- A. Provide detail drawings for proposed trench safety systems. Clearly identify where each system is proposed for use and type of system to use. Trench excavations cannot be started until trench safety systems are submitted and reviewed by Engineer.
 - 1. Trench Boxes: Submit manufacturer's standard data sheet and certificate of compliance signed by registered engineer stating maximum allowable depth for given design pressure for each type of trench box proposed for use.
 - 2. Alternative Systems: If alternative systems composed of steel, aluminum, wood, or combination of materials are proposed, submit design calculations signed by licensed engineer showing all member properties, design strengths, and any stress increases used with justification for use.

1.3 QUALITY ASSURANCE

- A. Work performed by forces with at least two years' experience with similar types of trench safety systems. All prefabricated items used in trench safety systems shall be manufactured by a company with at least two years' experience in fabricating items.
- B. Contractor responsible for complying with all trench safety requirements and safety of trenches and excavations.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Provide suitable materials able to withstand imposed loads without excessive deflections. Materials shall be clean, free of rust, holes, knots and other defects.

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- B. Steel shall be type and thickness as required by design with minimum yield stress of $F_y = 36,000$ psi.
 - C. Aluminum Type 6061-T6, thickness as required by design.
 - D. Wood in Contact with Earth: Pressure-treated soft woods or untreated hardwoods.
 - E. Wood Not in Contact with Earth: Soft or hardwood as required by design.

PART 3 - EXECUTION

3.1 JOB CONDITIONS

- A. Before starting trench excavations, Contractor shall examine all site conditions and note any conditions in existing structures and other items which may adversely affect trenching operations. Prepare written list of all conditions and submit to Engineer. During trenching operations, note any changes which occur to existing pavements or structures and submit written report to Engineer of all changes.

3.2 EXISTING UTILITIES

- A. Before starting trench excavations, chart and field locate all existing utilities. Notify owners of all utilities of work to perform. Protect all existing utilities from damage. Provide additional support for utility lines which cannot span trench width. Do not interrupt existing services without written approval by Engineer and utility owner.

3.3 TRENCHING PROCEDURES

- A. Provide shoring systems per submitted design to adequately resist earth pressures indicated on Drawings.
- B. Proceed with work in an orderly fashion. Install trench bracing systems as soon as possible after opening trenches. Do not allow workers in trench before installing trench bracing systems.
- C. Backfill trenches as soon as possible after completing work.
- D. Stockpile excavated materials 3 feet away from edge of trench.
- E. Maintain barricades and signage as required by state/local codes to protect open excavations.
- F. Do not allow surface water to enter excavations. Properly grade areas adjacent to trench excavations to control surface drainage away from excavations. Cover excavations which must remain open during periods of rainfall with suitable material to prevent accumulations of water in excavation.
- G. If cut-back method employed, maintain clear distance of 3 feet from edge of cut to avoid allowing loose material to enter trench.
- H. Do not operate heavy equipment except for trench digging equipment within 20 feet of edge of excavation.

END OF SECTION

• OSHA REGULATIONS •

• REGARDING TRENCH SAFETY (FROM FEDERAL REGISTER)

(2) The employer shall ensure that there is in the vicinity of each barge in use at least one U.S. Coast Guard-approved 30-inch lifering with not less than 90 feet of line attached, and at least one portable or permanent ladder which will reach the top of the apron to the surface of the water. If the above equipment is not available at the pier, the employer shall furnish it during the time that he is working the barge.

(3) Employees walking or working on the unguarded decks of barges shall be protected with U.S. Coast Guard-approved work vests or buoyant vests.

(e) *Commercial diving operations.* Commercial diving operations shall be subject to subpart T of part 1910, §§ 1910.401-1910.441, of this chapter.

[39 FR 22801, June 24, 1974, as amended at 42 FR 37674, July 22, 1977]

§ 1926.606 Definitions applicable to this subpart.

(a) *Apron*—The area along the waterfront edge of the pier or wharf.

(b) *Bulwark*—The side of a ship above the upper deck.

(c) *Coaming*—The raised frame, as around a hatchway in the deck, to keep out water.

(d) *Jacob's ladder*—A marine ladder of rope or chain with wooden or metal rungs.

(e) *Rail*, for the purpose of § 1926.605, means a light structure serving as a guard at the outer edge of a ship's deck.

Subpart P—Excavations

AUTHORITY: Sec. 107, Contract Worker Hours and Safety Standards Act (Construction Safety Act) (40 U.S.C. 333); Secs. 4, 6, 8, Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657); Secretary of Labor's Order No. 12-71 (36 FR 8754), 8-76 (41 FR 25059), or 9-83 (48 FR 35736), as applicable, and 29 CFR part 1911.

SOURCE: 54 FR 45959, Oct. 31, 1989, unless otherwise noted.

§ 1926.650 Scope, application, and definitions applicable to this subpart.

(a) *Scope and application.* This subpart applies to all open excavations made in the earth's surface. Excavations are defined to include trenches.

(b) *Definitions applicable to this subpart.*

Accepted engineering practices means those requirements which are compatible with standards of practice required by a registered professional engineer.

Aluminum Hydraulic Shoring means a pre-engineered shoring system comprised of aluminum hydraulic cylinders (crossbraces) used in conjunction with vertical rails (uprights) or horizontal rails (walers). Such system is designed, specifically to support the sidewalls of an excavation and prevent cave-ins.

Bell-bottom pier hole means a type of shaft or footing excavation, the bottom of which is made larger than the cross section above to form a belled shape.

Benching (Benching system) means a method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

Cave-in means the separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person.

Competent person means one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

Cross braces mean the horizontal members of a shoring system installed perpendicular to the sides of the excavation, the ends of which bear against either uprights or wales.

Excavation means any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

Faces or sides means the vertical or inclined earth surfaces formed as a result of excavation work.

Failure means the breakage, displacement, or permanent deformation of a structural member or connection so as to reduce its structural integrity and its supportive capabilities.

Hazardous atmosphere means an atmosphere which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause death, illness, or injury.

Kickout means the accidental release or failure of a cross brace.

Protective system means a method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

Ramp means an inclined walking or working surface that is used to gain access to one point from another, and is constructed from earth or from structural materials such as steel or wood.

Registered Professional Engineer means a person who is registered as a professional engineer in the state where the work is to be performed. However, a professional engineer, registered in any state is deemed to be a "registered professional engineer" within the meaning of this standard when approving designs for "manufactured protective systems" or "tabulated data" to be used in interstate commerce.

Sheeting means the members of a shoring system that retain the earth in position and in turn are supported by other members of the shoring system.

Shield (Shield system) means a structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either premanufactured or job-built in accordance with § 1926.652 (c)(3) or (c)(4). Shields used in trenches are usually referred to as "trench boxes" or "trench shields."

Shoring (Shoring system) means a structure such as a metal hydraulic, mechanical or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.

Sides. See "Faces."

Sloping (Sloping system) means a method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

Stable rock means natural solid mineral material that can be excavated with vertical sides and will remain intact while exposed. Unstable rock is considered to be stable when the rock material on the side or sides of the excavation is secured against caving-in or movement by rock bolts or by another protective system that has been designed by a registered professional engineer.

Structural ramp means a ramp built of steel or wood, usually used for vehicle access. Ramps made of soil or rock are not considered structural ramps.

Support system means a structure such as underpinning, bracing, or shoring, which provides support to an adjacent structure, underground installation, or the sides of an excavation.

Tabulated data means tables and charts approved by a registered professional engineer and used to design and construct a protective system.

Trench (Trench excavation) means a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m). If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet (4.6 m) or less (measured at the bottom of the excavation), the excavation is also considered to be a trench.

Trench box. See "Shield."

Trench shield. See "Shield."

Uprights means the vertical members of a trench shoring system placed in contact with the earth and usually positioned so that individual members do not contact each other. Uprights placed so that individual members are closely spaced, in contact with or

interconnected to each other, are often called "sheeting."

Wales means horizontal members of a shoring system placed parallel to the excavation face whose sides bear against the vertical members of the shoring system or earth.

§ 1926.651 Specific excavation requirements.

(a) *Surface encumbrances.* All surface encumbrances that are located so as to create a hazard to employees shall be removed or supported, as necessary, to safeguard employees.

(b) *Underground installations.* (1) The estimated location of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work, shall be determined prior to opening an excavation.

(2) Utility companies or owners shall be contacted within established or customary local response times, advised of the proposed work, and asked to establish the location of the utility underground installations prior to the start of actual excavation. When utility companies or owners cannot respond to a request to locate underground utility installations within 24 hours (unless a longer period is required by state or local law), or cannot establish the exact location of these installations, the employer may proceed, provided the employer does so with caution, and provided detection equipment or other acceptable means to locate utility installations are used.

(3) When excavation operations approach the estimated location of underground installations, the exact location of the installations shall be determined by safe and acceptable means.

(4) While the excavation is open, underground installations shall be protected, supported or removed as necessary to safeguard employees.

(c) *Access and egress*—(1) *Structural ramps.* (i) Structural ramps that are used solely by employees as a means of access or egress from excavations shall be designed by a competent person. Structural ramps used for access or egress of equipment shall be designed by a competent person qualified in

structural design, and shall be constructed in accordance with the design.

(ii) Ramps and runways constructed of two or more structural members shall have the structural members connected together to prevent displacement.

(iii) Structural members used for ramps and runways shall be of uniform thickness.

(iv) Cleats or other appropriate means used to connect runway structural members shall be attached to the bottom of the runway or shall be attached in a manner to prevent tripping.

(v) Structural ramps used in lieu of steps shall be provided with cleats or other surface treatments on the top surface to prevent slipping.

(2) *Means of egress from trench excavations.* A stairway, ladder, ramp or other safe means of egress shall be located in trench excavations that are 4 feet (1.22 m) or more in depth so as to require no more than 25 feet (7.62 m) of lateral travel for employees.

(d) *Exposure to vehicular traffic.* Employees exposed to public vehicular traffic shall be provided with, and shall wear, warning vests or other suitable garments marked with or made of reflectorized or high-visibility material.

(e) *Exposure to falling loads.* No employee shall be permitted underneath loads handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped, in accordance with § 1926.601(b)(6), to provide adequate protection for the operator during loading and unloading operations.

(f) *Warning system for mobile equipment.* When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system shall be utilized such as barricades, hand or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.

(g) *Hazardous atmospheres*—(1) *Testing and controls*. In addition to the requirements set forth in subparts D and E of this part (29 CFR 1926.50–1926.107) to prevent exposure to harmful levels of atmospheric contaminants and to assure acceptable atmospheric conditions, the following requirements shall apply:

(i) Where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmospheres in the excavation shall be tested before employees enter excavations greater than 4 feet (1.22 m) in depth.

(ii) Adequate precautions shall be taken to prevent employee exposure to atmospheres containing less than 19.5 percent oxygen and other hazardous atmospheres. These precautions include providing proper respiratory protection or ventilation in accordance with subparts D and E of this part respectively.

(iii) Adequate precaution shall be taken such as providing ventilation, to prevent employee exposure to an atmosphere containing a concentration of a flammable gas in excess of 20 percent of the lower flammable limit of the gas.

(iv) When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, testing shall be conducted as often as necessary to ensure that the atmosphere remains safe.

(2) *Emergency rescue equipment*. (i) Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, shall be readily available where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation. This equipment shall be attended when in use.

(ii) Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, shall wear a harness with a life-line securely attached to it. The lifeline shall be separate from any line used to handle materials, and shall be individually attended at all times while the employee

wearing the lifeline is in the excavation.

(h) *Protection from hazards associated with water accumulation*. (1) Employees shall not work in excavations in which there is accumulated water, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation. The precautions necessary to protect employees adequately vary with each situation, but could include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of a safety harness and lifeline.

(2) If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operations shall be monitored by a competent person to ensure proper operation.

(3) If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. Excavations subject to runoff from heavy rains will require an inspection by a competent person and compliance with paragraphs (h)(1) and (h)(2) of this section.

(i) *Stability of adjacent structures*. (1) Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning shall be provided to ensure the stability of such structures for the protection of employees.

(2) Excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to employees shall not be permitted except when:

(i) A support system, such as underpinning, is provided to ensure the safety of employees and the stability of the structure; or

(ii) The excavation is in stable rock; or

(iii) A registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be

unaffected by the excavation activity; or

(iv) A registered professional engineer has approved the determination that such excavation work will not pose a hazard to employees.

(3) Sidewalks, pavements, and appurtenant structure shall not be undermined unless a support system or another method of protection is provided to protect employees from the possible collapse of such structures.

(j) *Protection of employees from loose rock or soil.* (1) Adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection shall consist of scaling to remove loose material; installation of protective barricades at intervals as necessary on the face to stop and contain falling material; or other means that provide equivalent protection.

(2) Employees shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping such materials or equipment at least 2 feet (.61 m) from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.

(k) *Inspections.* (1) Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence. These inspections are only required when employee exposure can be reasonably anticipated.

(2) Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees

shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

(l) Walkways shall be provided where employees or equipment are required or permitted to cross over excavations. Guardrails which comply with §1926.502(b) shall be provided where walkways are 6 feet (1.8 m) or more above lower levels.

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§ 1926.652 Requirements for protective systems.

(a) *Protection of employees in excavations.* (1) Each employee in an excavation shall be protected from cave-ins by an adequate protective system designed in accordance with paragraph (b) or (c) of this section except when:

(i) Excavations are made entirely in stable rock; or

(ii) Excavations are less than 5 feet (1.52m) in depth and examination of the ground by a competent person provides no indication of a potential cave-in.

(2) Protective systems shall have the capacity to resist without failure all loads that are intended or could reasonably be expected to be applied or transmitted to the system.

(b) *Design of sloping and benching systems.* The slopes and configurations of sloping and benching systems shall be selected and constructed by the employer or his designee and shall be in accordance with the requirements of paragraph (b)(1); or, in the alternative, paragraph (b)(2); or, in the alternative, paragraph (b)(3), or, in the alternative, paragraph (b)(4), as follows:

(1) *Option (1)—Allowable configurations and slopes.* (i) Excavations shall be sloped at an angle not steeper than one and one-half horizontal to one vertical (34 degrees measured from the horizontal), unless the employer uses one of the other options listed below.

(ii) Slopes specified in paragraph (b)(1)(i) of this section, shall be excavated to form configurations that are in accordance with the slopes shown for Type C soil in Appendix B to this subpart.

(2) *Option (2)—Determination of slopes and configurations using Appendices A and B.* Maximum allowable slopes, and allowable configurations for sloping

and benching systems, shall be determined in accordance with the conditions and requirements set forth in appendices A and B to this subpart.

(3) *Option (3)—Designs using other tabulated data.* (i) Designs of sloping or benching systems shall be selected from and be in accordance with tabulated data, such as tables and charts.

(ii) The tabulated data shall be in written form and shall include all of the following:

(A) Identification of the parameters that affect the selection of a sloping or benching system drawn from such data;

(B) Identification of the limits of use of the data, to include the magnitude and configuration of slopes determined to be safe;

(C) Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.

(iii) At least one copy of the tabulated data which identifies the registered professional engineer who approved the data, shall be maintained at the jobsite during construction of the protective system. After that time the data may be stored off the jobsite, but a copy of the data shall be made available to the Secretary upon request.

(4) *Option (4)—Design by a registered professional engineer.* (i) Sloping and benching systems not utilizing Option (1) or Option (2) or Option (3) under paragraph (b) of this section shall be approved by a registered professional engineer.

(ii) Designs shall be in written form and shall include at least the following:

(A) The magnitude of the slopes that were determined to be safe for the particular project;

(B) The configurations that were determined to be safe for the particular project; and

(C) The identity of the registered professional engineer approving the design.

(iii) At least one copy of the design shall be maintained at the jobsite while the slope is being constructed. After that time the design need not be at the jobsite, but a copy shall be made available to the Secretary upon request.

(c) *Design of support systems, shield systems, and other protective systems. De-*

signs of support systems shield systems, and other protective systems shall be selected and constructed by the employer or his designee and shall be in accordance with the requirements of paragraph (c)(1); or, in the alternative, paragraph (c)(2); or, in the alternative, paragraph (c)(3); or, in the alternative, paragraph (c)(4) as follows:

(1) *Option (1)—Designs using appendices A, C and D.* Designs for timber shoring in trenches shall be determined in accordance with the conditions and requirements set forth in appendices A and C to this subpart. Designs for aluminum hydraulic shoring shall be in accordance with paragraph (c)(2) of this section, but if manufacturer's tabulated data cannot be utilized, designs shall be in accordance with appendix D.

(2) *Option (2)—Designs Using Manufacturer's Tabulated Data.* (i) Design of support systems, shield systems, or other protective systems that are drawn from manufacturer's tabulated data shall be in accordance with all specifications, recommendations, and limitations issued or made by the manufacturer.

(ii) Deviation from the specifications, recommendations, and limitations issued or made by the manufacturer shall only be allowed after the manufacturer issues specific written approval.

(iii) Manufacturer's specifications, recommendations, and limitations, and manufacturer's approval to deviate from the specifications, recommendations, and limitations shall be in written form at the jobsite during construction of the protective system. After that time this data may be stored off the jobsite, but a copy shall be made available to the Secretary upon request.

(3) *Option (3)—Designs using other tabulated data.* (i) Designs of support systems, shield systems, or other protective systems shall be selected from and be in accordance with tabulated data, such as tables and charts.

(ii) The tabulated data shall be in written form and include all of the following:

(A) Identification of the parameters that affect the selection of a protective system drawn from such data;

(B) Identification of the limits of use of the data;

(C) Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.

(iii) At least one copy of the tabulated data, which identifies the registered professional engineer who approved the data, shall be maintained at the jobsite during construction of the protective system. After that time the data may be stored off the jobsite, but a copy of the data shall be made available to the Secretary upon request.

(4) *Option (4)—Design by a registered professional engineer.* (i) Support systems, shield systems, and other protective systems not utilizing Option 1, Option 2 or Option 3, above, shall be approved by a registered professional engineer.

(ii) Designs shall be in written form and shall include the following:

(A) A plan indicating the sizes, types, and configurations of the materials to be used in the protective system; and

(B) The identity of the registered professional engineer approving the design.

(iii) At least one copy of the design shall be maintained at the jobsite during construction of the protective system. After that time, the design may be stored off the jobsite, but a copy of the design shall be made available to the Secretary upon request.

(d) *Materials and equipment.* (1) Materials and equipment used for protective systems shall be free from damage or defects that might impair their proper function.

(2) Manufactured materials and equipment used for protective systems shall be used and maintained in a manner that is consistent with the recommendations of the manufacturer, and in a manner that will prevent employee exposure to hazards.

(3) When material or equipment that is used for protective systems is damaged, a competent person shall examine the material or equipment and evaluate its suitability for continued use. If the competent person cannot assure the material or equipment is able to support the intended loads or is otherwise suitable for safe use, then such material or equipment shall be re-

moved from service, and shall be evaluated and approved by a registered professional engineer before being returned to service.

(e) *Installation and removal of support—(1) General.* (i) Members of support systems shall be securely connected together to prevent sliding, falling, kickouts, or other predictable failure.

(ii) Support systems shall be installed and removed in a manner that protects employees from cave-ins, structural collapses, or from being struck by members of the support system.

(iii) Individual members of support systems shall not be subjected to loads exceeding those which those members were designed to withstand.

(iv) Before temporary removal of individual members begins, additional precautions shall be taken to ensure the safety of employees, such as installing other structural members to carry the loads imposed on the support system.

(v) Removal shall begin at, and progress from, the bottom of the excavation. Members shall be released slowly so as to note any indication of possible failure of the remaining members of the structure or possible cave-in of the sides of the excavation.

(vi) Backfilling shall progress together with the removal of support systems from excavations.

(2) *Additional requirements for support systems for trench excavations.* (i) Excavation of material to a level no greater than 2 feet (.61 m) below the bottom of the members of a support system shall be permitted, but only if the system is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the support system.

(ii) Installation of a support system shall be closely coordinated with the excavation of trenches.

(f) *Sloping and benching systems.* Employees shall not be permitted to work on the faces of sloped or benched excavations at levels above other employees except when employees at the lower levels are adequately protected from

the hazard of falling, rolling, or sliding material or equipment.

(g) *Shield systems*—(1) *General.* (i) Shield systems shall not be subjected to loads exceeding those which the system was designed to withstand.

(ii) Shields shall be installed in a manner to restrict lateral or other hazardous movement of the shield in the event of the application of sudden lateral loads.

(iii) Employees shall be protected from the hazard of cave-ins when entering or exiting the areas protected by shields.

(iv) Employees shall not be allowed in shields when shields are being installed, removed, or moved vertically.

(2) *Additional requirement for shield systems used in trench excavations.* Excavations of earth material to a level not greater than 2 feet (.61 m) below the bottom of a shield shall be permitted, but only if the shield is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the shield.

APPENDIX A TO SUBPART P—SOIL CLASSIFICATION

(a) *Scope and application*—(1) *Scope.* This appendix describes a method of classifying soil and rock deposits based on site and environmental conditions, and on the structure and composition of the earth deposits. The appendix contains definitions, sets forth requirements, and describes acceptable visual and manual tests for use in classifying soils.

(2) *Application.* This appendix applies when a sloping or benching system is designed in accordance with the requirements set forth in §1926.652(b)(2) as a method of protection for employees from cave-ins. This appendix also applies when timber shoring for excavations is designed as a method of protection from cave-ins in accordance with appendix C to subpart P of part 1926, and when aluminum hydraulic shoring is designed in accordance with appendix D. This Appendix also applies if other protective systems are designed and selected for use from data prepared in accordance with the requirements set forth in §1926.652(c), and the use of the data is predicated on the use of the soil classification system set forth in this appendix.

(b) *Definitions.* The definitions and examples given below are based on, in whole or in part, the following: American Society for Testing Materials (ASTM) Standards D653-85 and D2488; The Unified Soils Classification

System, The U.S. Department of Agriculture (USDA) Textural Classification Scheme; and The National Bureau of Standards Report BSS-121.

Cemented soil means a soil in which the particles are held together by a chemical agent, such as calcium carbonate, such that a hand-size sample cannot be crushed into powder or individual soil particles by finger pressure.

Cohesive soil means clay (fine grained soil), or soil with a high clay content, which has cohesive strength. Cohesive soil does not crumble, can be excavated with vertical sideslopes, and is plastic when moist. Cohesive soil is hard to break up when dry, and exhibits significant cohesion when submerged. Cohesive soils include clayey silt, sandy clay, silty clay, clay and organic clay.

Dry soil means soil that does not exhibit visible signs of moisture content.

Fissured means a soil material that has a tendency to break along definite planes of fracture with little resistance, or a material that exhibits open cracks, such as tension cracks, in an exposed surface.

Granular soil means gravel, sand, or silt, (coarse grained soil) with little or no clay content. Granular soil has no cohesive strength. Some moist granular soils exhibit apparent cohesion. Granular soil cannot be molded when moist and crumbles easily when dry.

Layered system means two or more distinctly different soil or rock types arranged in layers. Micaceous seams or weakened planes in rock or shale are considered layered.

Moist soil means a condition in which a soil looks and feels damp. Moist cohesive soil can easily be shaped into a ball and rolled into small diameter threads before crumbling. Moist granular soil that contains some cohesive material will exhibit signs of cohesion between particles.

Plastic means a property of a soil which allows the soil to be deformed or molded without cracking, or appreciable volume change.

Saturated soil means a soil in which the voids are filled with water. Saturation does not require flow. Saturation, or near saturation, is necessary for the proper use of instruments such as a pocket penetrometer or shear vane.

Soil classification system means, for the purpose of this subpart, a method of categorizing soil and rock deposits in a hierarchy of Stable Rock, Type A, Type B, and Type C, in decreasing order of stability. The categories are determined based on an analysis of the properties and performance characteristics of the deposits and the environmental conditions of exposure.

Stable rock means natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.

Submerged soil means soil which is under-water or is free seeping.

Type A means cohesive soils with an unconfined compressive strength of 1.5 ton per square foot (tsf) (144 kPa) or greater. Examples of cohesive soils are: clay, silty clay, sandy clay, clay loam and, in some cases, silty clay loam and sandy clay loam. Cemented soils such as caliche and hardpan are also considered *Type A*. However, no soil is *Type A* if:

- (i) The soil is fissured; or
- (ii) The soil is subject to vibration from heavy traffic, pile driving, or similar effects; or
- (iii) The soil has been previously disturbed; or
- (iv) The soil is part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or greater; or
- (v) The material is subject to other factors that would require it to be classified as a less stable material.

Type B means:

- (i) Cohesive soil with an unconfined compressive strength greater than 0.5 tsf (48 kPa) but less than 1.5 tsf (144 kPa); or
- (ii) Granular cohesionless soils including: angular gravel (similar to crushed rock), silt, silt loam, sandy loam and, in some cases, silty clay loam and sandy clay loam.
- (iii) Previously disturbed soils except those which would otherwise be classed as *Type C* soil.
- (iv) Soil that meets the unconfined compressive strength or cementation requirements for *Type A*, but is fissured or subject to vibration; or
- (v) Dry rock that is not stable; or
- (vi) Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than four horizontal to one vertical (4H:1V), but only if the material would otherwise be classified as *Type B*.

Type C means:

- (i) Cohesive soil with an unconfined compressive strength of 0.5 tsf (48 kPa) or less; or
- (ii) Granular soils including gravel, sand, and loamy sand; or
- (iii) Submerged soil or soil from which water is freely seeping; or
- (iv) Submerged rock that is not stable; or
- (v) Material in a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or steeper.

Unconfined compressive strength means the load per unit area at which a soil will fail in compression. It can be determined by laboratory testing, or estimated in the field using a pocket penetrometer, by thumb penetration tests, and other methods.

Wet soil means soil that contains significantly more moisture than moist soil, but in such a range of values that cohesive material will slump or begin to flow when vibrated. Granular material that would exhibit cohe-

sive properties when moist will lose those cohesive properties when wet.

(c) *Requirements*—(i) *Classification of soil and rock deposits*. Each soil and rock deposit shall be classified by a competent person as Stable Rock, *Type A*, *Type B*, or *Type C* in accordance with the definitions set forth in paragraph (b) of this appendix.

(2) *Basis of classification*. The classification of the deposits shall be made based on the results of at least one visual and at least one manual analysis. Such analyses shall be conducted by a competent person using tests described in paragraph (d) below, or in other recognized methods of soil classification and testing such as those adopted by the American Society for Testing Materials, or the U.S. Department of Agriculture textural classification system.

(3) *Visual and manual analyses*. The visual and manual analyses, such as those noted as being acceptable in paragraph (d) of this appendix, shall be designed and conducted to provide sufficient quantitative and qualitative information as may be necessary to identify properly the properties, factors, and conditions affecting the classification of the deposits.

(4) *Layered systems*. In a layered system, the system shall be classified in accordance with its weakest layer. However, each layer may be classified individually where a more stable layer lies under a less stable layer.

(5) *Reclassification*. If, after classifying a deposit, the properties, factors, or conditions affecting its classification change in any way, the changes shall be evaluated by a competent person. The deposit shall be reclassified as necessary to reflect the changed circumstances.

(d) *Acceptable visual and manual tests*.—(1) *Visual tests*. Visual analysis is conducted to determine qualitative information regarding the excavation site in general, the soil adjacent to the excavation, the soil forming the sides of the open excavation, and the soil taken as samples from excavated material.

(i) Observe samples of soil that are excavated and soil in the sides of the excavation. Estimate the range of particle sizes and the relative amounts of the particle sizes. Soil that is primarily composed of fine-grained material is cohesive material. Soil composed primarily of coarse-grained sand or gravel is granular material.

(ii) Observe soil as it is excavated. Soil that remains in clumps when excavated is cohesive. Soil that breaks up easily and does not stay in clumps is granular.

(iii) Observe the side of the opened excavation and the surface area adjacent to the excavation. Crack-like openings such as tension cracks could indicate fissured material. If chunks of soil spall off a vertical side, the soil could be fissured. Small spalls are evidence of moving ground and are indications of potentially hazardous situations.

(iv) Observe the area adjacent to the excavation and the excavation itself for evidence of existing utility and other underground structures, and to identify previously disturbed soil.

(v) Observe the opened side of the excavation to identify layered systems. Examine layered systems to identify if the layers slope toward the excavation. Estimate the degree of slope of the layers.

(vi) Observe the area adjacent to the excavation and the sides of the opened excavation for evidence of surface water, water seeping from the sides of the excavation, or the location of the level of the water table.

(vii) Observe the area adjacent to the excavation and the area within the excavation for sources of vibration that may affect the stability of the excavation face.

(2) *Manual tests.* Manual analysis of soil samples is conducted to determine quantitative as well as qualitative properties of soil and to provide more information in order to classify soil properly.

(i) *Plasticity.* Mold a moist or wet sample of soil into a ball and attempt to roll it into threads as thin as 1/4-inch in diameter. Cohesive material can be successfully rolled into threads without crumbling. For example, if at least a two inch (50 mm) length of 1/4-inch thread can be held on one end without tearing, the soil is cohesive.

(ii) *Dry strength.* If the soil is dry and crumbles on its own or with moderate pressure into individual grains or fine powder, it is granular (any combination of gravel, sand, or silt). If the soil is dry and falls into clumps which break up into smaller clumps, but the smaller clumps can only be broken up with difficulty, it may be clay in any combination with gravel, sand or silt. If the dry soil breaks into clumps which do not break up into small clumps and which can only be broken with difficulty, and there is no visual indication the soil is fissured, the soil may be considered unfissured.

(iii) *Thumb penetration.* The thumb penetration test can be used to estimate the unconfined compressive strength of cohesive soils. (This test is based on the thumb penetration test described in American Society for Testing and Materials (ASTM) Standard designation D2488—"Standard Recommended Practice for Description of Soils (Visual—Manual Procedure).") Type A soils with an unconfined compressive strength of 1.5 tsf can be readily indented by the thumb; however, they can be penetrated by the thumb only with very great effort. Type C soils with an unconfined compressive strength of 0.5 tsf can be easily penetrated several inches by the thumb, and can be molded by light finger pressure. This test should be conducted on an undisturbed soil sample, such as a large clump of spoil, as soon as practicable after excavation to keep to a minimum the effects of exposure to drying influences. If the excavation

is later exposed to wetting influences (rain, flooding), the classification of the soil must be changed accordingly.

(iv) *Other strength tests.* Estimates of unconfined compressive strength of soils can also be obtained by use of a pocket penetrometer or by using a hand-operated shearvane.

(v) *Drying test.* The basic purpose of the drying test is to differentiate between cohesive material with fissures, unfissured cohesive material, and granular material. The procedure for the drying test involves drying a sample of soil that is approximately one inch thick (2.54 cm) and six inches (15.24 cm) in diameter until it is thoroughly dry:

(A) If the sample develops cracks as it dries, significant fissures are indicated.

(B) Samples that dry without cracking are to be broken by hand. If considerable force is necessary to break a sample, the soil has significant cohesive material content. The soil can be classified as a unfissured cohesive material and the unconfined compressive strength should be determined.

(C) If a sample breaks easily by hand, it is either a fissured cohesive material or a granular material. To distinguish between the two, pulverize the dried clumps of the sample by hand or by stepping on them. If the clumps do not pulverize easily, the material is cohesive with fissures. If they pulverize easily into very small fragments, the material is granular.

APPENDIX B TO SUBPART P—SLOPING AND BENCHING

(a) *Scope and application.* This appendix contains specifications for sloping and benching when used as methods of protecting employees working in excavations from cave-ins. The requirements of this appendix apply when the design of sloping and benching protective systems is to be performed in accordance with the requirements set forth in § 1926.652(b)(2).

(b) *Definitions.*

Actual slope means the slope to which an excavation face is excavated.

Distress means that the soil is in a condition where a cave-in is imminent or is likely to occur. Distress is evidenced by such phenomena as the development of fissures in the face of or adjacent to an open excavation; the subsidence of the edge of an excavation; the slumping of material from the face or the bulging or heaving of material from the bottom of an excavation; the spalling of material from the face of an excavation; and raveling, i.e., small amounts of material such as pebbles or little clumps of material suddenly separating from the face of an excavation and trickling or rolling down into the excavation.

Maximum allowable slope means the steepest incline of an excavation face that is acceptable for the most favorable site conditions as protection against cave-ins, and is expressed as the ratio of horizontal distance to vertical rise (H:V).

Short term exposure means a period of time less than or equal to 24 hours that an excavation is open.

(c) *Requirements*—(1) *Soil classification.* Soil and rock deposits shall be classified in accordance with appendix A to subpart P of part 1926.

(2) *Maximum allowable slope.* The maximum allowable slope for a soil or rock deposit shall be determined from Table B-1 of this appendix.

(3) *Actual slope.* (i) The actual slope shall not be steeper than the maximum allowable slope.

(ii) The actual slope shall be less steep than the maximum allowable slope, when there are signs of distress. If that situation occurs, the slope shall be cut back to an actual slope which is at least 1/2 horizontal to one vertical (1/2H:1V) less steep than the maximum allowable slope.

(iii) When surcharge loads from stored material or equipment, operating equipment, or traffic are present, a competent person shall determine the degree to which the actual slope must be reduced below the maximum allowable slope, and shall assure that such reduction is achieved. Surcharge loads from adjacent structures shall be evaluated in accordance with §1926.651(i).

(4) *Configurations.* Configurations of sloping and benching systems shall be in accordance with Figure B-1.

TABLE B-1
MAXIMUM ALLOWABLE SLOPES

SOIL OR ROCK TYPE	MAXIMUM ALLOWABLE SLOPES (H:V) [1] FOR EXCAVATIONS LESS THAN 20 FEET DEEP [3]
STABLE ROCK TYPE A [2] TYPE B TYPE C	VERTICAL (90°) 3/4 : 1 (53°) 1:1 (45°) 1 1/2 : 1 (34°)

NOTES:

- Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angles have been rounded off.
- A short-term maximum allowable slope of 1/2H:1V (63°) is allowed in excavations in Type A soil that are 12 feet (3.67 m) or less in depth. Short-term maximum allowable slopes for excavations greater than 12 feet (3.67 m) in depth shall be 3/4H:1V (53°).
- Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.

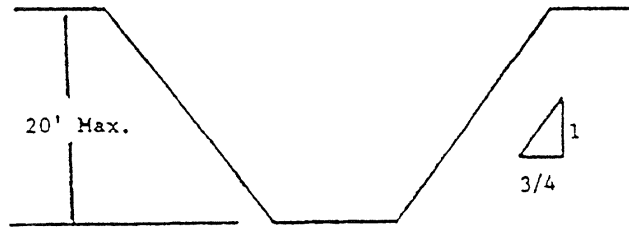
Figure B-1

Slope Configurations

(All slopes stated below are in the horizontal to vertical ratio)

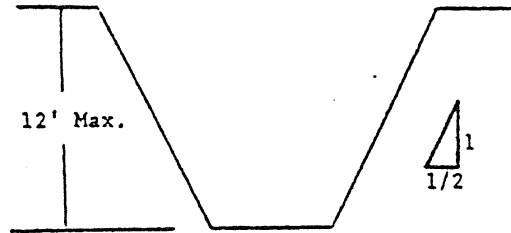
B-1.1 Excavations made in Type A soil.

- All simple slope excavation 20 feet or less in depth shall have a maximum allowable slope of 3/4:1.



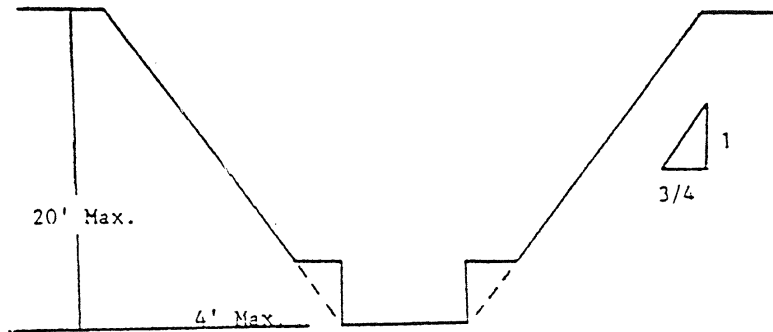
SIMPLE SLOPE—GENERAL

Exception: Simple slope excavations which are open 24 hours or less (short term) and which are 12 feet or less in depth shall have a maximum allowable slope of 1/2:1.

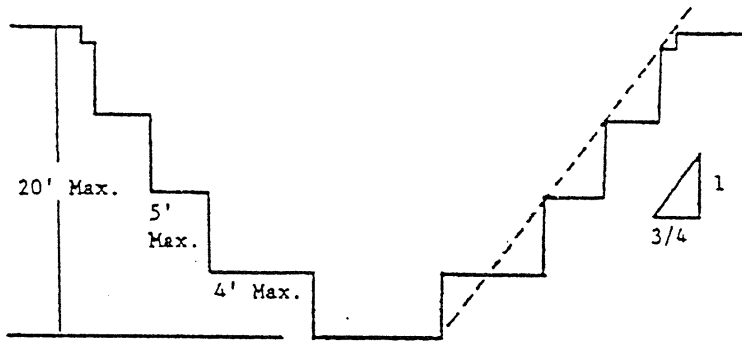


SIMPLE SLOPE—SHORT TERM

2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 3/4 to 1 and maximum bench dimensions as follows:

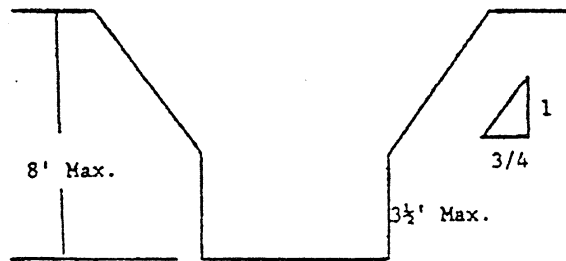


SIMPLE BENCH



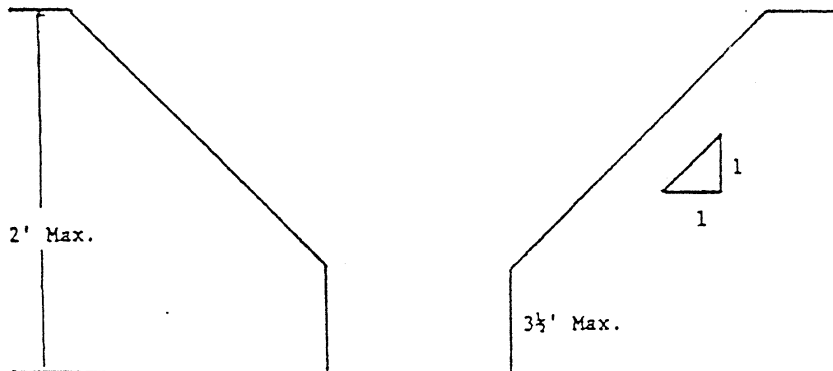
MULTIPLE BENCH

3. All excavations 8 feet or less in depth which have unsupported vertically sided lower portions shall have a maximum vertical side of 3½ feet.



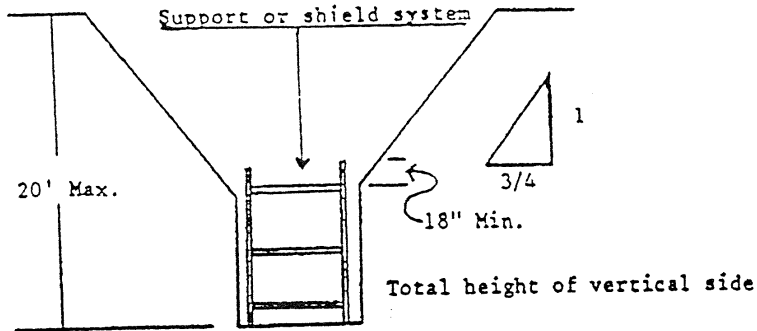
UNSUPPORTED VERTICALLY SIDED LOWER PORTION—MAXIMUM 8 FEET IN DEPTH

All excavations more than 8 feet but not more than 12 feet in depth which unsupported vertically sided lower portions shall have a maximum allowable slope of 1:1 and a maximum vertical side of 3½ feet.



UNSUPPORTED VERTICALLY SIDED LOWER PORTION—MAXIMUM 12 FEET IN DEPTH

All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of 3/4:1. The support or shield system must extend at least 18 inches above the top of the vertical side.

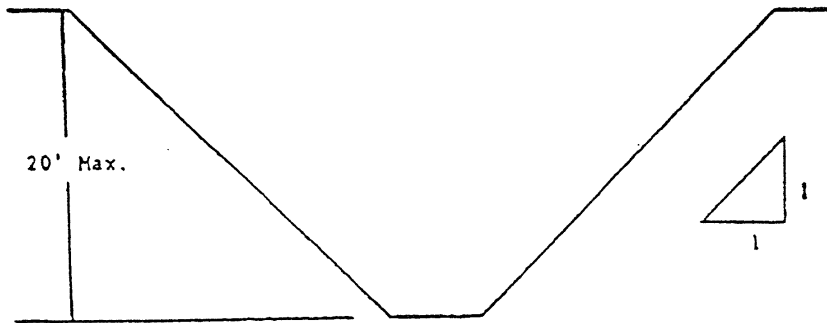


SUPPORTED OR SHIELDED VERTICALLY SIDED LOWER PORTION

4. All other simple slope, compound slope, and vertically sided lower portion excavations shall be in accordance with the other options permitted under §1926.652(b).

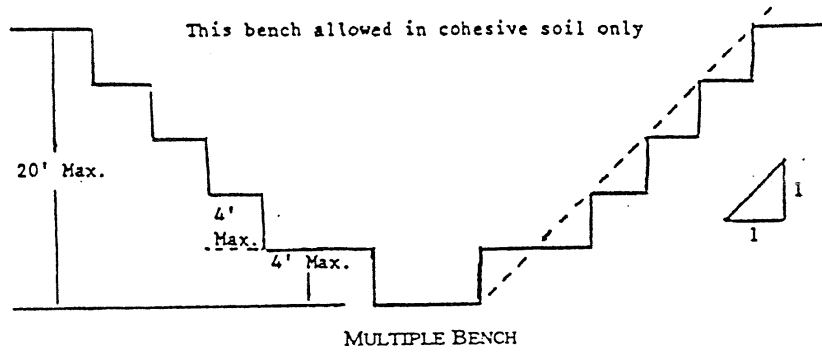
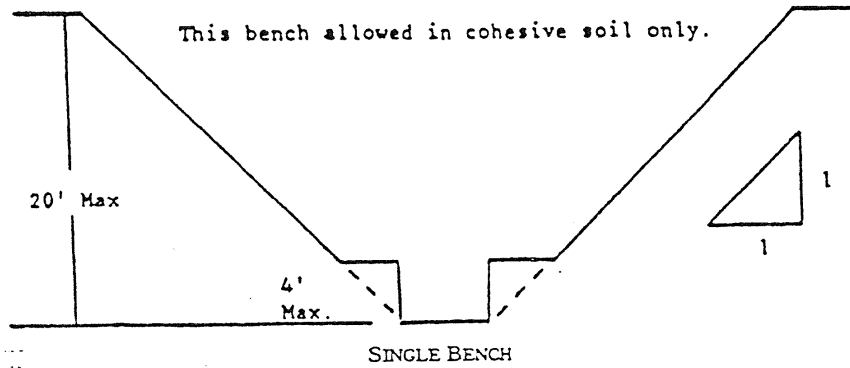
B-1.2 Excavations Made in Type B Soil

1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1.

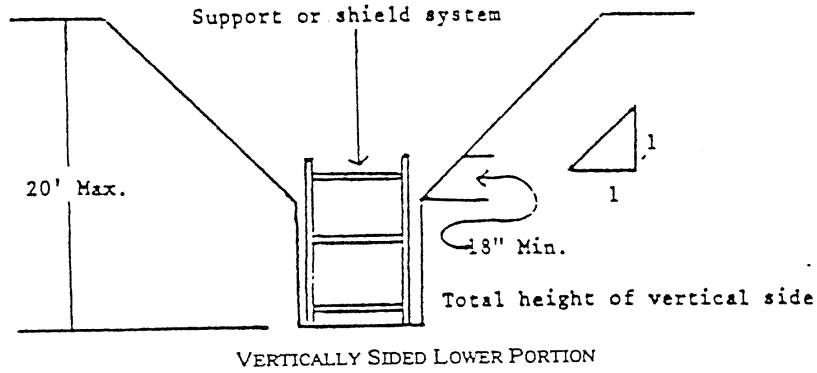


SIMPLE SLOPE

2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1 and maximum bench dimensions as follows:



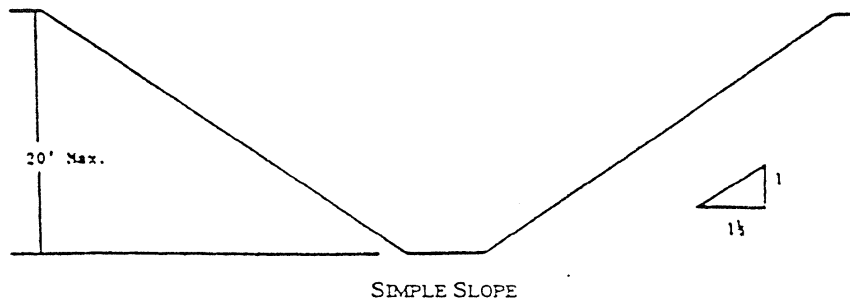
3. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1:1.



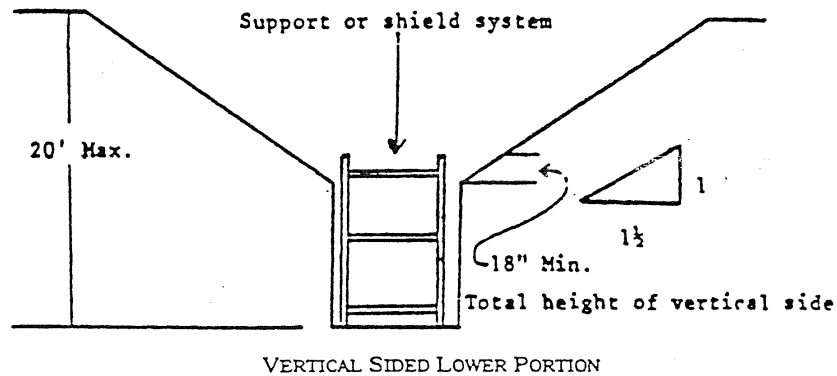
4. All other sloped excavations 20 feet or less in depth shall be in accordance with the other options permitted in §1926.652(b).

B-1.3 Excavations Made in Type C Soil

1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1½:1.



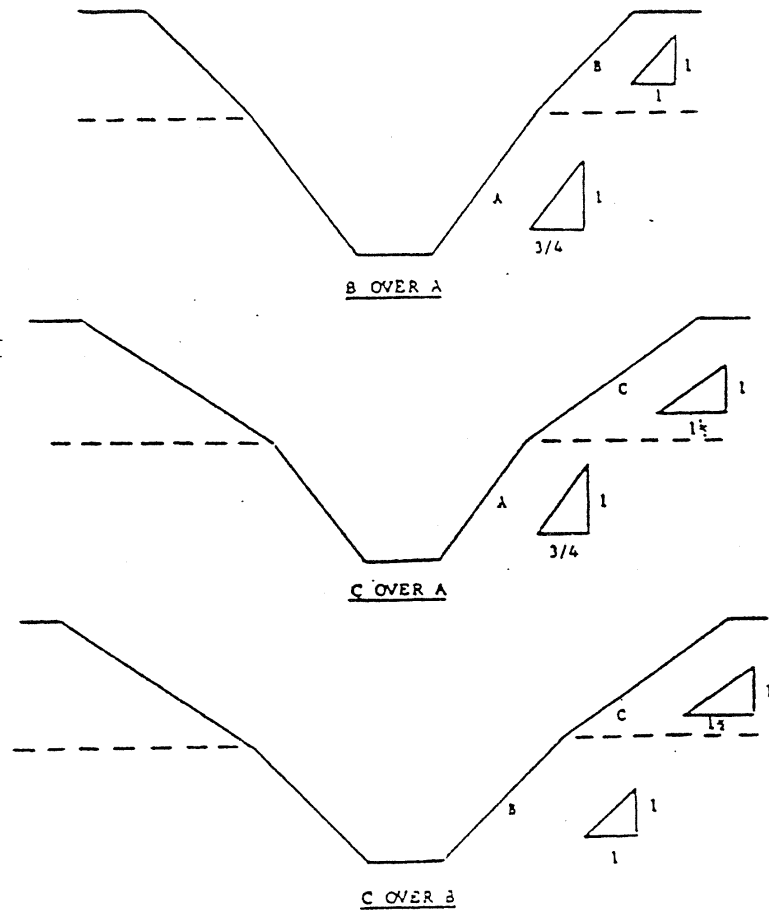
2. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of $1\frac{1}{2}:1$.

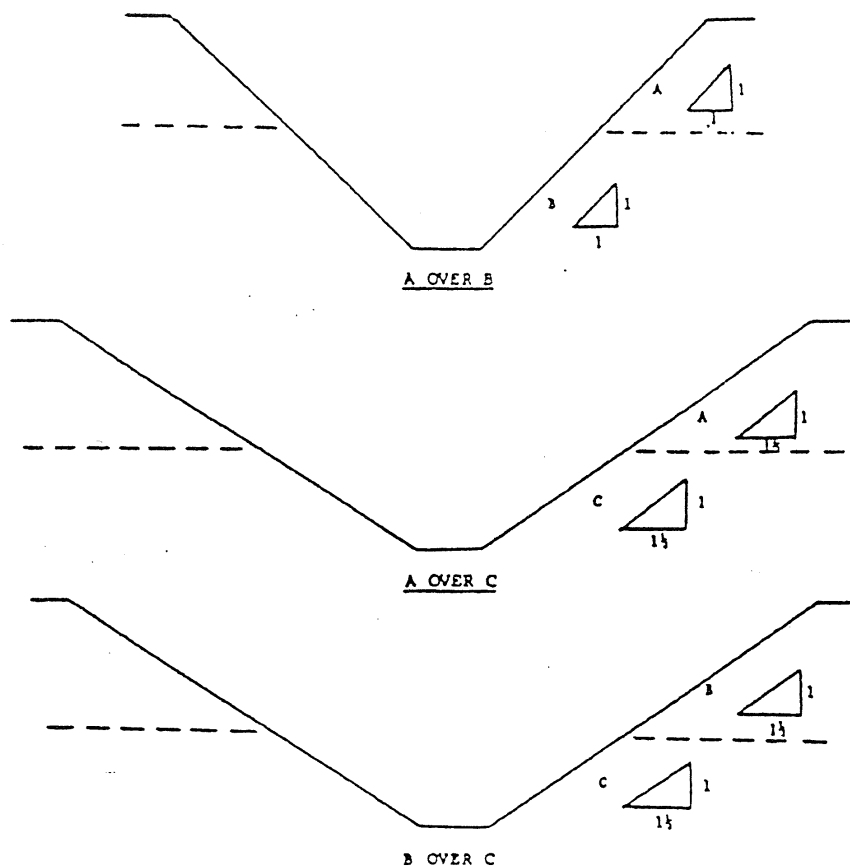


3. All other sloped excavations shall be in accordance with the other options permitted in §1926.652(b).

B-1.4 Excavations Made in Layered Soils

1. All excavations 20 feet or less in depth made in layered soils shall have a maximum allowable slope for each layer as set forth below.





2. All other sloped excavations shall be in accordance with the other options permitted in § 1926.652(b).

APPENDIX C TO SUBPART P—TIMBER SHORING FOR TRENCHES

(a) *Scope.* This appendix contains information that can be used timber shoring is provided as a method of protection from cave-ins in trenches that do not exceed 20 feet (6.1 m) in depth. This appendix must be used when design of timber shoring protective systems is to be performed in accordance with § 1926.652(c)(1). Other timber shoring configurations; other systems of support such as hydraulic and pneumatic systems; and other protective systems such as sloping, benching, shielding, and freezing systems must be designed in accordance with

the requirements set forth in § 1926.652(b) and § 1926.652(c).

(b) *Soil Classification.* In order to use the data presented in this appendix, the soil type or types in which the excavation is made must first be determined using the soil classification method set forth in appendix A of subpart P of this part.

(c) *Presentation of Information.* Information is presented in several forms as follows:

(1) Information is presented in tabular form in Tables C-1.1, C-1.2, and C-1.3, and Tables C-2.1, C-2.2 and C-2.3 following paragraph (g) of the appendix. Each table presents the minimum sizes of timber members to use in a shoring system, and each table contains data only for the particular soil

type in which the excavation or portion of the excavation is made. The data are arranged to allow the user the flexibility to select from among several acceptable configurations of members based on varying the horizontal spacing of the crossbraces. Stable rock is exempt from shoring requirements and therefore, no data are presented for this condition.

(2) Information concerning the basis of the tabular data and the limitations of the data is presented in paragraph (d) of this appendix, and on the tables themselves.

(3) Information explaining the use of the tabular data is presented in paragraph (e) of this appendix.

(4) Information illustrating the use of the tabular data is presented in paragraph (f) of this appendix.

(5) Miscellaneous notations regarding Tables C-1.1 through C-1.3 and Tables C-2.1 through C-2.3 are presented in paragraph (g) of this Appendix.

(d) *Basis and limitations of the data.*—(1) *Dimensions of timber members.* (i) The sizes of the timber members listed in Tables C-1.1 through C-1.3 are taken from the National Bureau of Standards (NBS) report, "Recommended Technical Provisions for Construction Practice in Shoring and Sloping of Trenches and Excavations." In addition, where NBS did not recommend specific sizes of members, member sizes are based on an analysis of the sizes required for use by existing codes and on empirical practice.

(ii) The required dimensions of the members listed in Tables C-1.1 through C-1.3 refer to actual dimensions and not nominal dimensions of the timber. Employers wanting to use nominal size shoring are directed to Tables C-2.1 through C-2.3, or have this choice under §1926.652(c)(3), and are referred to The Corps of Engineers, The Bureau of Reclamation or data from other acceptable sources.

(2) *Limitation of application.* (i) It is not intended that the timber shoring specification apply to every situation that may be experienced in the field. These data were developed to apply to the situations that are most commonly experienced in current trenching practice. Shoring systems for use in situations that are not covered by the data in this appendix must be designed as specified in §1926.652(c).

(ii) When any of the following conditions are present, the members specified in the tables are not considered adequate. Either an alternate timber shoring system must be designed or another type of protective system designed in accordance with §1926.652.

(A) When loads imposed by structures or by stored material adjacent to the trench weigh in excess of the load imposed by a two-foot soil surcharge. The term "adjacent" as used here means the area within a horizontal

distance from the edge of the trench equal to the depth of the trench.

(B) When vertical loads imposed on cross braces exceed a 240-pound gravity load distributed on a one-foot section of the center of the crossbrace.

(C) When surcharge loads are present from equipment weighing in excess of 20,000 pounds.

(D) When only the lower portion of a trench is shored and the remaining portion of the trench is sloped or benched unless: The sloped portion is sloped at an angle less steep than three horizontal to one vertical; or the members are selected from the tables for use at a depth which is determined from the top of the overall trench, and not from the toe of the sloped portion.

(e) *Use of Tables.* The members of the shoring system that are to be selected using this information are the cross braces, the uprights, and the wales, where wales are required. Minimum sizes of members are specified for use in different types of soil. There are six tables of information, two for each soil type. The soil type must first be determined in accordance with the soil classification system described in appendix A to subpart P of part 1926. Using the appropriate table, the selection of the size and spacing of the members is then made. The selection is based on the depth and width of the trench where the members are to be installed and, in most instances, the selection is also based on the horizontal spacing of the crossbraces. Instances where a choice of horizontal spacing of crossbracing is available, the horizontal spacing of the crossbraces must be chosen by the user before the size of any member can be determined. When the soil type, the width and depth of the trench, and the horizontal spacing of the crossbraces are known, the size and vertical spacing of the crossbraces, the size and vertical spacing of the wales, and the size and horizontal spacing of the uprights can be read from the appropriate table.

(f) *Examples to Illustrate the Use of Tables C-1.1 through C-1.3.*

(1) *Example 1.*

A trench dug in Type A soil is 13 feet deep and five feet wide.

From Table C-1.1, for acceptable arrangements of timber can be used.

Arrangement #1

Space 4x4 crossbraces at six feet horizontally and four feet vertically.

Wales are not required.

Space 3x8 uprights at six feet horizontally. This arrangement is commonly called "skid shoring."

Arrangement #2

Space 4x6 crossbraces at eight feet horizontally and four feet vertically.

Space 8x8 wales at four feet vertically.
Space 2x6 uprights at four feet horizontally.

Arrangement #3

Space 6x6 crossbraces at 10 feet horizontally and four feet vertically.
Space 8x10 wales at four feet vertically.
Space 2x6 uprights at five feet horizontally.

Arrangement #4

Space 6x6 crossbraces at 12 feet horizontally and four feet vertically.
Space 10x10 wales at four feet vertically.
Spaces 3x8 uprights at six feet horizontally.

(2) Example 2.

A trench dug in Type B soil in 13 feet deep and five feet wide. From Table C-1.2 three acceptable arrangements of members are listed.

Arrangement #1

Space 6x6 crossbraces at six feet horizontally and five feet vertically.
Space 8x8 wales at five feet vertically.
Space 2x6 uprights at two feet horizontally.

Arrangement #2

Space 6x8 crossbraces at eight feet horizontally and five feet vertically.
Space 10x10 wales at five feet vertically.
Space 2x6 uprights at two feet horizontally.

Arrangement #3

Space 8x8 crossbraces at 10 feet horizontally and five feet vertically.
Space 10x12 wales at five feet vertically.
Space 2x6 uprights at two feet vertically.

(3) Example 3.

A trench dug in Type C soil is 13 feet deep and five feet wide.

From Table C-1.3 two acceptable arrangements of members can be used.

Arrangement #1

Space 8x8 crossbraces at six feet horizontally and five feet vertically.
Space 10x12 wales at five feet vertically.
Position 2x6 uprights as closely together as possible.

If water must be retained use special tongue and groove uprights to form tight sheeting.

Arrangement #2

Space 8x10 crossbraces at eight feet horizontally and five feet vertically.

Space 12x12 wales at five feet vertically.

Position 2x6 uprights in a close sheeting configuration unless water pressure must be resisted. Tight sheeting must be used where water must be retained.

(4) Example 4.

A trench dug in Type C soil is 20 feet deep and 11 feet wide. The size and spacing of members for the section of trench that is over 15 feet in depth is determined using Table C-1.3. Only one arrangement of members is provided.

Space 8x10 crossbraces at six feet horizontally and five feet vertically.

Space 12x12 wales at five feet vertically.

Use 3x6 tight sheeting.

Use of Tables C-2.1 through C-2.3 would follow the same procedures.

(g) Notes for all Tables.

1. Member sizes at spacings other than indicated are to be determined as specified in §1926.652(c), "Design of Protective Systems."

2. When conditions are saturated or submerged use Tight Sheeting. Tight Sheeting refers to the use of specially-edged timber planks (e.g., tongue and groove) at least three inches thick, steel sheet piling, or similar construction that when driven or placed in position provide a tight wall to resist the lateral pressure of water and to prevent the loss of backfill material. Close Sheeting refers to the placement of planks side-by-side allowing as little space as possible between them.

3. All spacing indicated is measured center to center.

4. Wales to be installed with greater dimension horizontal.

5. If the vertical distance from the center of the lowest crossbrace to the bottom of the trench exceeds two and one-half feet, uprights shall be firmly embedded or a mudsill shall be used. Where uprights are embedded, the vertical distance from the center of the lowest crossbrace to the bottom of the trench shall not exceed 36 inches. When mudsills are used, the vertical distance shall not exceed 42 inches. Mudsills are wales that are installed at the toe of the trench side.

6. Trench jacks may be used in lieu of or in combination with timber crossbraces.

7. Placement of crossbraces. When the vertical spacing of crossbraces is four feet, place the top crossbrace no more than two feet below the top of the trench. When the vertical spacing of crossbraces is five feet, place the top crossbrace no more than 2.5 feet below the top of the trench.

TABLE C-1.2
TIMBER TRENCH SHORING -- MINIMUM TIMBER REQUIREMENTS *
SOIL TYPE B P_a = 45 X H + 72 psf (2 ft. Surcharge)

DEPTH OF TRENCH (FEET)	SIZE (ACTUAL) AND SPACING OF MEMBERS**										UPRIGHTS		
	CROSS BRACES					RAILS					MAXIMUM ALLOWABLE HORIZONTAL SPACING		
	HORIZ. SPACING (FEET)	WIDTH OF TRENCH (FEET)		VERT. SPACING (FEET)		VERT. SPACING (FEET)	SIZE (IN.)	VERT. SPACING (FEET)	CLOSE	2	3		
5	UP TO 6	4X6	6X6	6X6	6X6	5	6X8	5			2X6		
	UP TO 8	6X6	6X6	6X6	6X8	5	8X10	5			2X6		
	UP TO 10	6X6	6X6	6X6	6X8	5	10X10	5			2X6		
	See Note 1												
10	UP TO 6	6X6	6X6	6X6	6X8	5	8X8	5			2X6		
	UP TO 8	6X8	6X8	6X8	8X8	5	10X10	5			2X6		
	UP TO 10	8X8	8X8	8X8	8X10	5	10X12	5			2X6		
	See Note 1												
15	UP TO 6	6X8	6X8	6X8	8X8	5	8X10	5			3X6		
	UP TO 8	8X8	8X8	8X8	8X10	5	10X12	5			3X6		
	UP TO 10	8X10	8X10	8X10	10X10	5	12X12	5			3X6		
	See Note 1												
OVER 20	SEE NOTE 1												

* Mixed oak or equivalent with a bending strength not less than 850 psi.
 ** Manufactured members of equivalent strength may be substituted for wood.

TABLE C-1.3
 Trench Shoring --- Minimum Timber Requirements *
 SOIL TYPE C P_A = 80 X H + 72 psf (2 ft. Surcharge)

DEPTH OF TRENCH (FEET)	SIZE (ACTUAL) AND SPACING OF MEMBERS**										UPRIGHTS							
	CROSS BRACES					CROSS BRACES					VERT. SPACING (FEET)	MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET) (See Note 2)						
	HORIZ. SPACING (FEET)		WIDTH OF TRENCH (FEET)			WIDTH OF TRENCH (FEET)			VERT. SPACING (FEET)									
UP TO	TO	4	6	9	12	15	UP TO	UP TO	UP TO	UP TO	UP TO	UP TO	UP TO	UP TO	UP TO	UP TO	UP TO	
5	UP TO 6	6X8	6X8	6X8	8X8	8X8	8X8	8X8	8X8	5	5	8X10	5	2X6				
TO 10	UP TO 8	8X8	8X8	8X8	8X8	8X10	8X10	8X10	8X10	5	5	10X12	5	2X6				
10	UP TO 10	8X10	8X10	8X10	8X10	10X10	10X10	10X10	10X10	5	5	12X12	5	2X6				
	See Note 1																	
10	UP TO 6	8X8	8X8	8X8	8X8	8X10	8X10	8X10	8X10	5	5	10X12	5	2X6				
TO 15	UP TO 8	8X10	8X10	8X10	8X10	10X10	10X10	10X10	10X10	5	5	12X12	5	2X6				
	See Note 1																	
	See Note 1																	
15	UP TO 6	8X10	8X10	8X10	8X10	10X10	10X10	10X10	10X10	5	5	12X12	5	3X6				
TO 20	See Note 1																	
	See Note 1																	
OVER 20	See Note 1																	

* Mixed Oak or equivalent with a bending strength not less than 850 psi.
 ** Manufactured members of equivalent strength may be substituted for wood.

TABLE C-2.1
TIMBER TRENCH SHORING — MINIMUM TIMBER REQUIREMENTS *
 SOIL TYPE A P_a = 25 X H + 72 psf (2 ft. Surcharge)

DEPTH OF TRENCH (FEET)	CROSS BRACES										MALES				UPRIGHTS			
	HORIZ. SPACING (FEET)		WIDTH OF TRENCH (FEET)				VERT. SPACING (FEET)		SIZE (IN)		VERT. SPACING (FEET)		MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET)		HORIZONTAL SPACING (FEET)			
			UP TO 4	UP TO 6	UP TO 9	UP TO 12											UP TO 15	CLOSE
5 TO 10	UP TO 6	4X4	4X4	4X4	4X4	4X6	4	Not Req'd	4	Not Req'd	4	4X6						
	UP TO 8	4X4	4X4	4X4	4X6	4X6	4	Not Req'd	4	Not Req'd	4					4X8		
	UP TO 10	4X6	4X6	4X6	4X6	6X6	4	8X8	4	4	4	4X6						
10 TO 15	UP TO 6	4X4	4X4	4X4	4X6	6X6	4	8X8	4	4	4					4X6		
	UP TO 8	4X6	4X6	4X6	4X6	6X6	4	Not Req'd	4	Not Req'd	4					4X10		
	UP TO 10	6X6	6X6	6X6	6X6	6X6	4	8X8	4	4	4	4X6						
15 TO 20	UP TO 6	6X6	6X6	6X6	6X6	6X6	4	8X10	4	4	4	4X6				4X10		
	UP TO 8	6X6	6X6	6X6	6X6	6X6	4	8X8	4	4	4							
	UP TO 10	6X6	6X6	6X6	6X6	6X8	4	8X10	4	4	4	3X6						
OVER 20	UP TO 6	6X6	6X6	6X6	6X6	6X6	4	8X8	4	4	4	3X6						
	UP TO 8	6X6	6X6	6X6	6X6	6X6	4	8X8	4	4	4	3X6	4X12					
	UP TO 10	6X6	6X6	6X6	6X6	6X8	4	8X10	4	4	4	3X6						
UP TO 12	6X6	6X6	6X6	6X8	6X8	4	8X12	4	4	4	3X6	4X12						
OVER 20	SEE NOTE 1																	

* Douglas fir or equivalent with a bending strength not less than 1500 psi.
 ** Manufactured members of equivalent strength may be substituted for wood.

TABLE C-2.3

TIMBER TRENCH SHORING -- MINIMUM TIMBER REQUIREMENTS *
 SOIL TYPE C P_a = 80 X H + 72 def (2 ft. Surcharge)

DEPTH OF TRENCH (FEET)	SIZE (S4S) AND SPACING OF MEMBERS **											
	GROSS BRACES					HALES					UPRIGHTS	
	HORIZ. SPACING (FEET)		WIDTH OF TRENCH (FEET)			VERT. SPACING (FEET)		VERT. SPACING (FEET)		VERT. SPACING (FEET)		MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET)
5 TO 10	UP TO 6	6X6	6X6	6X6	6X6	8X8	5	8X8	5	3X6	CLOSE	
	UP TO 8	6X6	6X6	6X6	6X6	8X8	5	10X10	5	3X6		
	UP TO 10	6X6	6X6	8X8	8X8	8X8	5	10X12	5	3X6		
10 TO 15	UP TO 6	6X8	6X8	6X8	6X8	8X8	5	10X10	5	4X6		
	UP TO 8	8X8	8X8	8X8	8X8	8X8	5	12X12	5	4X6		
	UP TO 10	8X8	8X8	8X8	8X8	8X8	5	12X12	5	4X6		
15 TO 20	UP TO 6	8X8	8X8	8X8	8X10	8X10	5	10X12	5	4X6		
	UP TO 8	8X8	8X8	8X8	8X10	8X10	5	10X12	5	4X6		
	UP TO 10	8X8	8X8	8X8	8X10	8X10	5	10X12	5	4X6		
OVER 20	SEE NOTE 1											

* Douglas fir or equivalent with a bending strength not less than 1500 psi.
 ** Manufactured members of equivalent strength may be substituted for wood.

APPENDIX D TO SUBPART P—ALUMINUM
HYDRAULIC SHORING FOR TRENCHES

(a) *Scope.* This appendix contains information that can be used when aluminum hydraulic shoring is provided as a method of protection against cave-ins in trenches that do not exceed 20 feet (6.1m) in depth. This appendix must be used when design of the aluminum hydraulic protective system cannot be performed in accordance with §1926.652(c)(2).

(b) *Soil Classification.* In order to use data presented in this appendix, the soil type or types in which the excavation is made must first be determined using the soil classification method set forth in appendix A of subpart P of part 1926.

(c) *Presentation of Information.* Information is presented in several forms as follows:

(1) Information is presented in tabular form in Tables D-1.1, D-1.2, D-1.3 and E-1.4. Each table presents the maximum vertical and horizontal spacings that may be used with various aluminum member sizes and various hydraulic cylinder sizes. Each table contains data only for the particular soil type in which the excavation or portion of the excavation is made. Tables D-1.1 and D-1.2 are for vertical shores in Types A and B soil. Tables D-1.3 and D-1.4 are for horizontal waler systems in Types B and C soil.

(2) Information concerning the basis of the tabular data and the limitations of the data is presented in paragraph (d) of this appendix.

(3) Information explaining the use of the tabular data is presented in paragraph (e) of this appendix.

(4) Information illustrating the use of the tabular data is presented in paragraph (f) of this appendix.

(5) Miscellaneous notations (footnotes) regarding Table D-1.1 through D-1.4 are presented in paragraph (g) of this appendix.

(6) Figures, illustrating typical installations of hydraulic shoring, are included just prior to the Tables. The illustrations page is entitled "Aluminum Hydraulic Shoring; Typical Installations."

(d) *Basis and limitations of the data.*

(1) Vertical shore rails and horizontal wales are those that meet the Section Modulus requirements in the D-1 Tables. Aluminum material is 6061-T6 or material of equivalent strength and properties.

(2) Hydraulic cylinders specifications. (i) 2-inch cylinders shall be a minimum 2-inch inside diameter with a minimum safe working capacity of no less than 18,000 pounds axial compressive load at maximum extension. Maximum extension is to include full range of cylinder extensions as recommended by product manufacturer.

(ii) 3-inch cylinders shall be a minimum 3-inch inside diameter with a safe working capacity of not less than 30,000 pounds axial

compressive load at extensions as recommended by product manufacturer.

(3) *Limitation of application.*

(i) It is not intended that the aluminum hydraulic specification apply to every situation that may be experienced in the field. These data were developed to apply to the situations that are most commonly experienced in current trenching practice. Shoring systems for use in situations that are not covered by the data in this appendix must be otherwise designed as specified in §1926.652(c).

(ii) When any of the following conditions are present, the members specified in the Tables are not considered adequate. In this case, an alternative aluminum hydraulic shoring system or other type of protective system must be designed in accordance with §1926.652.

(A) When vertical loads imposed on cross braces exceed a 100 Pound gravity load distributed on a one foot section of the center of the hydraulic cylinder.

(B) When surcharge loads are present from equipment weighing in excess of 20,000 pounds.

(C) When only the lower portion or a trench is shored and the remaining portion of the trench is sloped or benched unless: The sloped portion is sloped at an angle less steep than three horizontal to one vertical; or the members are selected from the tables for use at a depth which is determined from the top of the overall trench, and not from the toe of the sloped portion.

(e) *Use of Tables D-1.1, D-1.2, D-1.3 and D-1.4.* The members of the shoring system that are to be selected using this information are the hydraulic cylinders, and either the vertical shores or the horizontal wales. When a waler system is used the vertical timber sheeting to be used is also selected from these tables. The Tables D-1.1 and D-1.2 for vertical shores are used in Type A and B soils that do not require sheeting, Type B soils that may require sheeting, and Type C soils that always require sheeting are found in the horizontal wale Tables D-1.3 and D-1.4. The soil type must first be determined in accordance with the soil classification system described in appendix A to subpart P of part 1926. Using the appropriate table, the selection of the size and spacing of the members is made. The selection is based on the depth and width of the trench where the members are to be installed. In these tables the vertical spacing is held constant at four feet on center. The tables show the maximum horizontal spacing of cylinders allowed for each size of wale in the waler system tables, and in the vertical shore tables, the hydraulic cylinder horizontal spacing is the same as the vertical shore spacing.

(f) *Example to Illustrate the Use of the Tables:*

(1) Example 1:

A trench dug in Type A soil is 6 feet deep and 3 feet wide. From Table D-1.1: Find vertical shores and 2 inch diameter cylinders spaced 8 feet on center (o.c.) horizontally and 4 feet on center (o.c.) vertically. (See Figures 1 & 3 for typical installations.)

(2) Example 2:

A trench is dug in Type B soil that does not require sheeting, 13 feet deep and 5 feet wide. From Table D-1.2: Find vertical shores and 2 inch diameter cylinders spaced 6.5 feet o.c. horizontally and 4 feet o.c. vertically. (See Figures 1 & 3 for typical installations.)

(3) A trench is dug in Type B soil that does not require sheeting, but does experience some minor raveling of the trench face. The trench is 16 feet deep and 9 feet wide. From Table D-1.2: Find vertical shores and 2 inch diameter cylinder (with special oversleeves as designated by footnote #2) spaced 5.5 feet o.c. horizontally and 4 feet o.c. vertically. Plywood (per footnote (g)(7) to the D-1 Table) should be used behind the shores. (See Figures 2 & 3 for typical installations.)

(4) Example 4: A trench is dug in previously disturbed Type B soil, with characteristics of a Type C soil, and will require sheeting. The trench is 18 feet deep and 12 feet wide. 8 foot horizontal spacing between cylinders is desired for working space. From Table D-1.3: Find horizontal wale with a section modulus of 14.0 spaced at 4 feet o.c. vertically and 3 inch diameter cylinder spaced at 9 feet maximum o.c. horizontally. 3x12 timber sheeting is required at close spacing vertically. (See Figure 4 for typical installation.)

(5) Example 5: A trench is dug in Type C soil, 9 feet deep and 4 feet wide. Horizontal cylinder spacing in excess of 6 feet is desired for working space. From Table D-1.4: Find horizontal wale with a section modulus of 7.0 and 2 inch diameter cylinders spaced at 6.5 feet o.c. horizontally. Or, find horizontal wale with a 14.0 section modulus and 3 inch diameter cylinder spaced at 10 feet o.c. horizontally. Both wales are spaced 4 feet o.c. vertically. 3x12 timber sheeting is required

at close spacing vertically. (See Figure 4 for typical installation.)

(g) Footnotes, and general notes, for Tables D-1.1, D-1.2, D-1.3, and D-1.4.

(1) For applications other than those listed in the tables, refer to § 1926.652(c)(2) for use of manufacturer's tabulated data. For trench depths in excess of 20 feet, refer to § 1926.652(c)(2) and § 1926.652(c)(3).

(2) 2 inch diameter cylinders, at this width, shall have structural steel tube (3.5x3.5x0.1875) oversleeves, or structural oversleeves of manufacturer's specification, extending the full, collapsed length.

(3) Hydraulic cylinders capacities. (i) 2 inch cylinders shall be a minimum 2-inch inside diameter with a safe working capacity of not less than 18,000 pounds axial compressive load at maximum extension. Maximum extension is to include full range of cylinder extensions as recommended by product manufacturer.

(ii) 3-inch cylinders shall be a minimum 3-inch inside diameter with a safe work capacity of not less than 30,000 pounds axial compressive load at maximum extension. Maximum extension is to include full range of cylinder extensions as recommended by product manufacturer.

(4) All spacing indicated is measured center to center.

(5) Vertical shoring rails shall have a minimum section modulus of 0.40 inch.

(6) When vertical shores are used, there must be a minimum of three shores spaced equally, horizontally, in a group.

(7) Plywood shall be 1.125 in. thick softwood or 0.75 inch. thick, 14 ply, arctic white birch (Finland form). Please note that plywood is not intended as a structural member, but only for prevention of local raveling (sloughing of the trench face) between shores.

(8) See appendix C for timber specifications.

(9) Wales are calculated for simple span conditions.

(10) See appendix D, item (d), for basis and limitations of the data.

ALUMINUM HYDRAULIC SHORING TYPICAL INSTALLATIONS

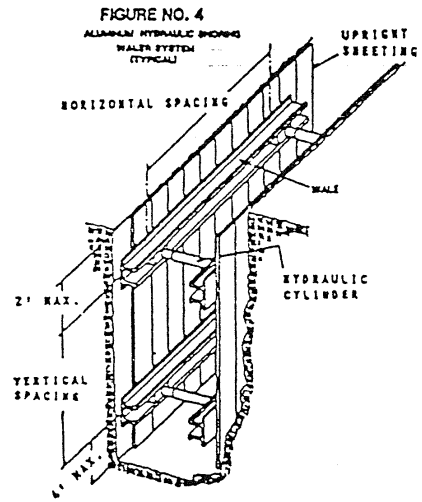
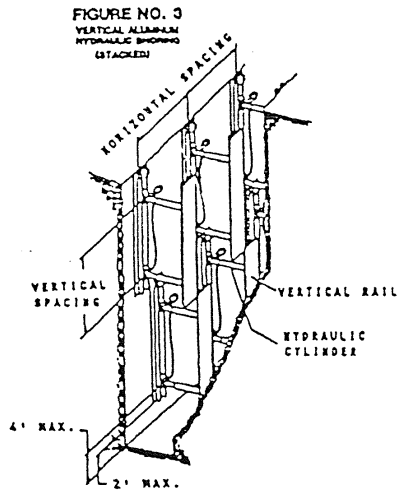
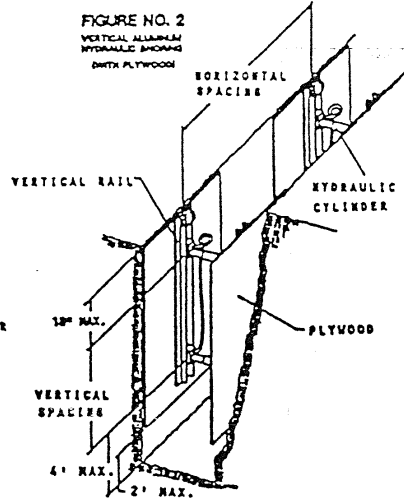
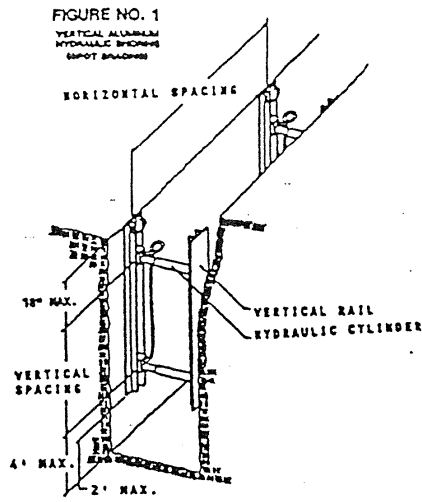


TABLE D - 1.1
ALUMINUM HYDRAULIC SHORING
VERTICAL SHORES
FOR SOIL TYPE A.

HYDRAULIC CYLINDERS					
DEPTH OF TRENCH (FEET)	MAXIMUM HORIZONTAL SPACING (FEET)	MAXIMUM VERTICAL SPACING (FEET)	WIDTH OF TRENCH (FEET)		
			UP TO 8	OVER 8 UP TO 12	
OVER 5 UP TO 10	8			OVER 12 UP TO 15	3 INCH DIAMETER
OVER 10 UP TO 15	8	4	2 INCH DIAMETER	OVER 8 UP TO 12	2 INCH DIAMETER NOTE (2)
OVER 15 UP TO 20	7				
OVER 20					NOTE (1)

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, Item (g)

Note (1): See Appendix D, Item (g) (1)

Note (2): See Appendix D, Item (g) (2)

TABLE D - 1.2
ALUMINUM HYDRAULIC SHORING
VERTICAL SHORES
FOR SOIL TYPE B

DEPTH OF TRENCH (FEET)	HYDRAULIC CYLINDERS			WIDTH OF TRENCH (FEET)	
	MAXIMUM HORIZONTAL SPACING (FEET)	MAXIMUM VERTICAL SPACING (FEET)	UP TO 8	OVER 8 UP TO 12	OVER 12 UP TO 15
OVER 5 UP TO 10	8	4	2 INCH DIAMETER	2 INCH DIAMETER NOTE (2)	3 INCH DIAMETER
OVER 10 UP TO 15	6.5				
OVER 15 UP TO 20	5.5				
OVER 20					

NOTE (1)

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, Item (g)

Note (1): See Appendix D, Item (g) (1)

Note (2): See Appendix D, Item (g) (2)

TABLE D - 1.3
ALUMINUM HYDRAULIC SHORING
WALER SYSTEMS
FOR SOIL TYPE B

DEPTH OF TRENCH (FEET)	WALES		HYDRAULIC CYLINDERS										TIMBER UPRIGHTS	
	VERTICAL SPACING (FEET)	SECTION MODULUS (IN ⁴)	WIDTH OF TRENCH (FEET)										MAX HORIZ SPACING (ON CENTER)	3 FT.
			UP TO 8		OVER 8 UP TO 12		OVER 12 UP TO 15		CYLINDER DIAMETER	SOLID SHEET	2 FT.			
		HORIZ SPACING	CYLINDER DIAMETER	HORIZ SPACING	CYLINDER DIAMETER	HORIZ SPACING	CYLINDER DIAMETER	HORIZ SPACING				CYLINDER DIAMETER		
OVER 5 UP TO 10	4	3.5	8.0	2 IN	8.0	2 IN	NOTE(2)	8.0	3 IN					3x12
			9.0	2 IN	9.0	NOTE(2)	9.0	3 IN						
			14.0	3 IN	12.0	3 IN	12.0	3 IN						
OVER 10 UP TO 15	4	3.5	6.0	2 IN	6.0	NOTE(2)	6.0	3 IN					3x12	
			8.0	3 IN	8.0	3 IN	8.0	3 IN						
			14.0	3 IN	10.0	3 IN	10.0	3 IN						
OVER 15 UP TO 20	4	7.0	5.5	2 IN	5.5	NOTE(2)	5.5	3 IN					3x12	
			6.0	3 IN	6.0	3 IN	6.0	3 IN						
			14.0	3 IN	9.0	3 IN	9.0	3 IN						
OVER 20	NOTE (1)													

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, Item (g)

Notes (1): See Appendix D, Item (g) (1)

Notes (2): See Appendix D, Item (g) (2)

♦ Consult product manufacturer and/or qualified engineer for Section Modulus of available wales.

TABLE D - 1.4
ALUMINUM HYDRAULIC SHORING
WALER SYSTEMS
FOR SOIL TYPE C

DEPTH OF TRENCH (FEET)	WALES		HYDRAULIC CYLINDERS						TIMBER UPRIGHTS		
	VERTICAL SPACING (FEET)	SECTION MODULUS (IN ⁴)	WIDTH OF TRENCH (FEET)						MAX. HORIZ. SPACING (ON CENTER)	SOLID SHEET	
			UP TO 8	OVER 8 UP TO 12	OVER 12 UP TO 15	OVER 15 UP TO 20	OVER 20 UP TO 25	OVER 25 UP TO 30			
OVER 5 UP TO 10	4	3.5	6.0	2 IN	6.0	2 IN	6.0	2 IN	6.0	3 IN	3 FT.
			7.0	2 IN	6.5	2 IN	6.5	2 IN	6.5	3 IN	
			14.0	3 IN	10.0	3 IN	10.0	3 IN	10.0	3 IN	
OVER 10 UP TO 15	4	3.5	4.0	2 IN	4.0	2 IN	4.0	2 IN	4.0	3 IN	3x12
			7.0	3 IN	5.5	3 IN	5.5	3 IN	5.5	3 IN	
			14.0	3 IN	8.0	3 IN	8.0	3 IN	8.0	3 IN	
OVER 15 UP TO 20	4	3.5	3.5	2 IN	3.5	2 IN	3.5	2 IN	3.5	3 IN	3x12
			7.0	3 IN	5.0	3 IN	5.0	3 IN	5.0	3 IN	
			14.0	3 IN	6.0	3 IN	6.0	3 IN	6.0	3 IN	
OVER 20	NOTE (1)										

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, Item (g)

Notes (1): See Appendix D, item (g) (1)

Notes (2): See Appendix D, item (g) (2)

* Consult product manufacturer and/or qualified engineer for Section Modulus of available wales.

APPENDIX E TO SUBPART P—ALTERNATIVES TO TIMBER SHORING

Figure 1. Aluminum Hydraulic Shoring

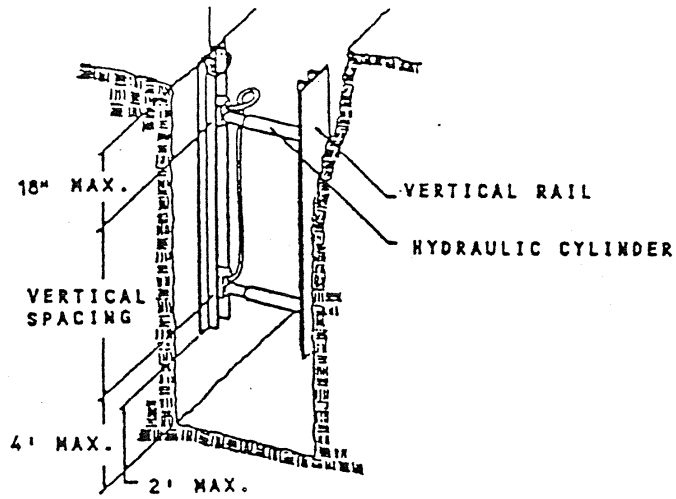


Figure 2. Pneumatic/hydraulic Shoring

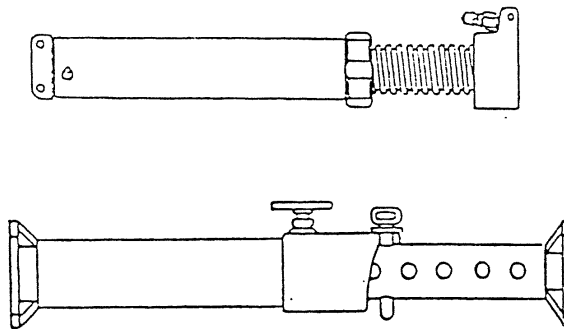


Figure 3. Trench Jacks (Screw Jacks)

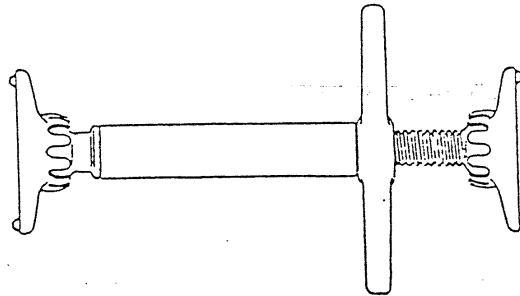
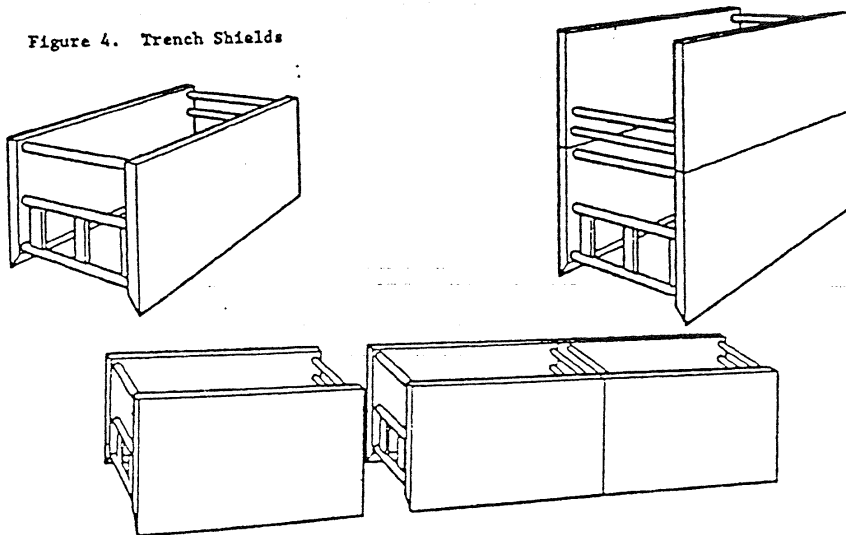


Figure 4. Trench Shields



APPENDIX F TO SUBPART P—SELECTION OF PROTECTIVE SYSTEMS

The following figures are a graphic summary of the requirements contained in subpart P for excavations 20 feet or less in depth. Protective systems for use in excavations more than 20 feet in depth must be designed by a registered professional engineer in accordance with §1926.652 (b) and (c).

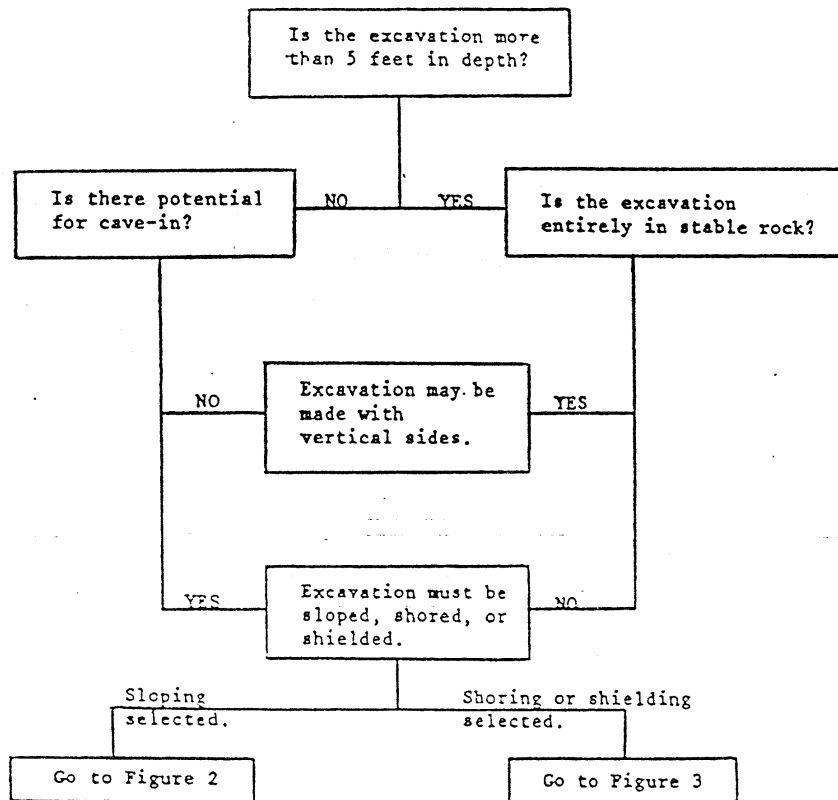


FIGURE 1 - PRELIMINARY DECISIONS

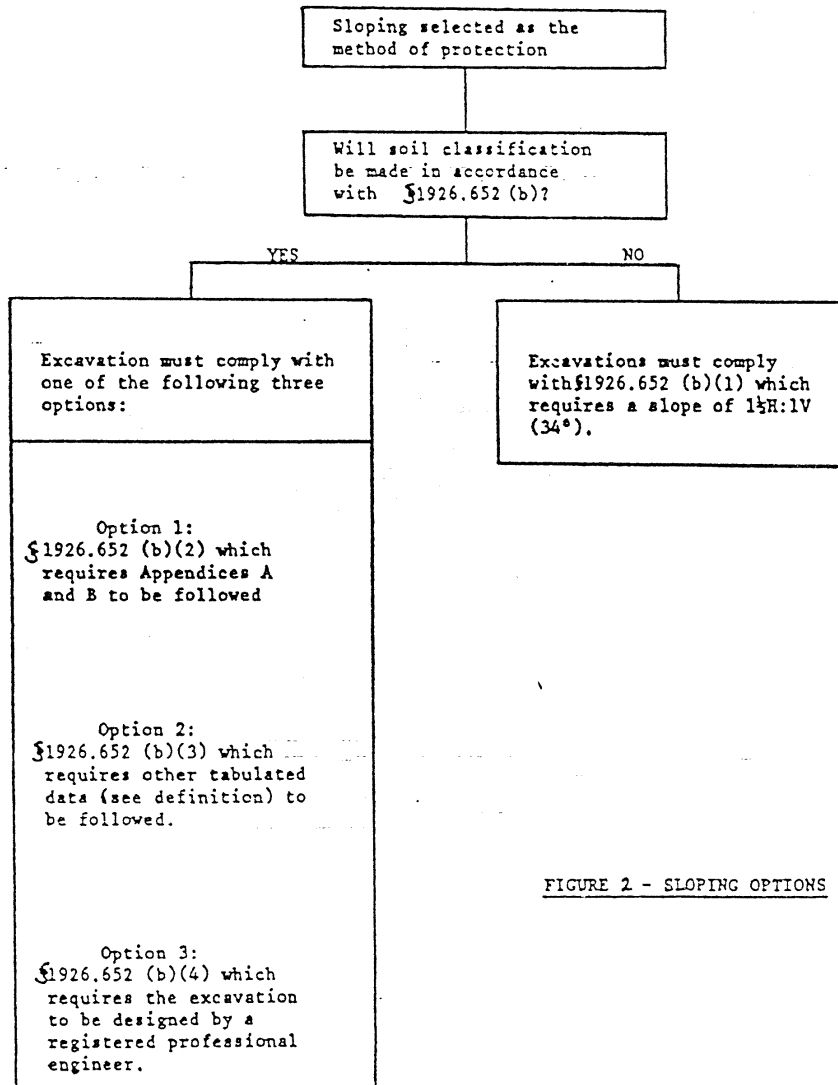


FIGURE 2 - SLOPING OPTIONS

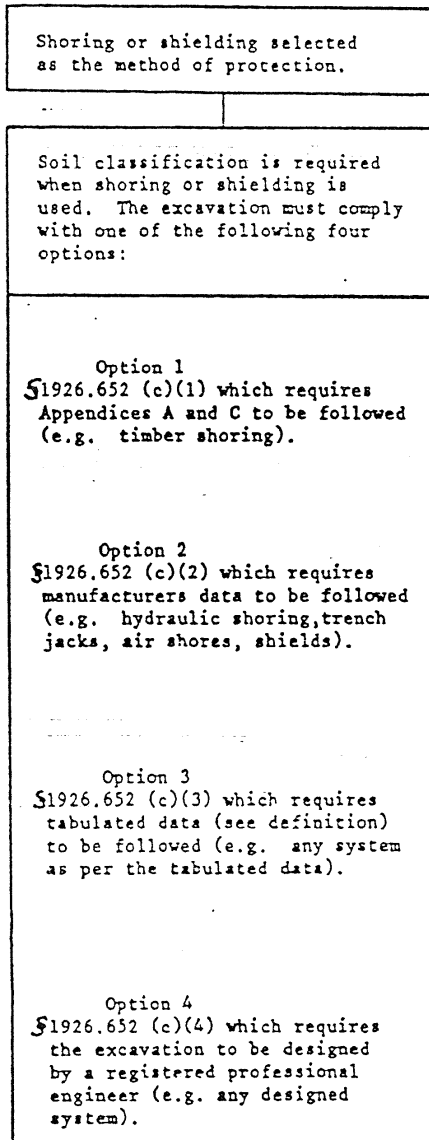


FIGURE 3 - SHORING AND SHIELDING OPTIONS

SECTION 32 11 23 - AGGREGATE BASE COURSES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Aggregate subbase.
 - 2. Aggregate base course.
- B. Related Sections:
 - 1. Division 01 Specification Sections apply to Work of this Section.
 - 2. Section 32 12 16 "Asphalt Paving."

1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials:
 - 1. AASHTO M288 - Standard Specification for Geotextile Specification for Highway Applications.
- B. ASTM International:
 - 1. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
 - 2. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
 - 3. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
 - 4. ASTM D2940 - Standard Specification for Graded Aggregate Material for Bases or Subbases for Highways or Airports.
 - 5. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
- C. Texas Department of Transportation (TxDOT)
 - 1. TxDOT Standard Construction Specifications, 2014.

1.3 SUBMITTALS

- A. Section 01 33 00 "Submittal Procedures:" Requirements for submittals.
- B. Materials Source: Submit name of aggregate materials suppliers.
- C. Manufacturer's Certificate: Certify all products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

- A. Furnish each aggregate material from single source throughout the Work.
- B. Perform Work according to City of El Paso standards.
- C. Perform work according to all requirements specified in the Construction Drawings and pertinent Specifications.

PART 2 - PRODUCTS

2.1 AGGREGATE BASE COURSES

- A. TxDOT – Type A, Grade 2, Item 247, 2014 Standard Construction Specifications.
 - 1. Type A Material: Crushed and consist of durable particles of stone mixed with approved binding material, or as approved by Engineer.
 - 2. Grade 2: When properly slaked and tested by TxDOT Standard Laboratory Methods, flexible base material shall meet the following retainage requirements:
 - a. 2 1/2-inch sieve: 0%
 - b. 1 3/4-inch sieve: 0-10%
 - c. 7/8-inch sieve: 10-35%
 - d. 3/8-inch sieve: 30-65%
 - e. No. 4 sieve: 45-75%
 - f. No. 40 sieve: 60-90%
 - 3. Material passing No. 40 sieve shall be known as “Soil Binder” and meet the following requirements when prepared per Test Method TxDOT 101-E procedure:
 - a. Liquid limit shall not exceed 40, or as allowed by Engineer.
 - b. Plasticity index shall not exceed 10, or as allowed by Engineer.
 - c. Wet ball mill value shall not exceed 40, or as allowed by Engineer.
 - d. Percent increase on No. 40 sieve shall not exceed 20, or as allowed by Engineer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 “Administrative Requirements:” Verification of existing conditions before starting work.
- B. Verify compacted substrate is dry and ready to support paving and imposed loads.
 - 1. Proof roll substrate in minimum two perpendicular passes to identify soft spots.
 - 2. Remove soft substrate and replace with compacted fill as specified in Section 31 23 23 “Backfill.”
- C. Verify substrate has been inspected, gradients and elevations are correct.

3.2 PREPARATION

- A. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.
- B. Do not place fill on soft, muddy, or frozen surfaces.

3.3 AGGREGATE PLACEMENT

- A. Spread Base Course over prepared substrate to total compacted thickness as indicated on Drawings.
- B. Compact Base Course to 98 percent maximum density per ASTM D1557 and within ± 2 percentage points of optimum moisture.
- C. Level and contour surfaces to elevations, profiles, and gradients indicated.

-
- D. Add small quantities of fine aggregate to coarse aggregate when required to assist compaction.
 - E. Maintain optimum moisture content of fill materials to attain specified compaction density.
 - F. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.4 TOLERANCES

- A. Section 01 40 00 “Quality Requirements:” Tolerances.
- B. Maximum Variation from Flat Surface: 1/2 inch measured with 10 foot straight edge.

3.5 FIELD QUALITY CONTROL

- A. Section 01 40 00 “Quality Requirements:” Field inspecting, testing, adjusting, and balancing.
- B. Compaction testing will be performed according to ASTM D1557.
- C. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.
- D. Frequency of Tests: One test for every 500 square yards of compacted aggregate.
- E. Owner will retain an independent engineering testing firm with specific testing equipment required to provide timely test results per Specifications. Coordinate and schedule all tests as required by Construction Drawings and Specifications. Coordinate with Engineer for any required visual inspections.
- F. Do not allow finished aggregate base courses to lose moisture beyond 3 percentage points of optimum, prior to asphaltic prime application. Should aggregate base course, due to any reason or cause, lose required moisture, stability, density, or finish before final surfacing is placed, rework, recompact, and refinish without additional compensation.

END OF SECTION

SECTION 32 12 16 - ASPHALT PAVING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Asphalt materials.
 - 2. Aggregate materials.
 - 3. Aggregate subbase.
 - 4. Asphalt paving base course, binder course, and wearing course.
 - 5. Asphalt paving overlay for existing paving.
 - 6. Surface slurry.
- B. Related Requirement:
 - 1. Section 31 23 23 "Fill:" Compacted subbase for paving.
 - 2. Section 32 11 23 "Aggregate Base Courses:" Compacted subbase for paving.

1.2 REFERENCE STANDARDS

- A. American Association of State Highway and Transportation Officials:
 - 1. AASHTO M17 - Standard Specification for Mineral Filler for Bituminous Paving Mixtures.
 - 2. AASHTO M29 - Standard Specification for Fine Aggregate for Bituminous Paving Mixtures.
 - 3. AASHTO M140 - Standard Specification for Emulsified Asphalt.
 - 4. AASHTO M208 - Standard Specification for Cationic Emulsified Asphalt.
 - 5. AASHTO M288 - Standard Specification for Geotextile Specification for Highway Applications.
 - 6. AASHTO M320 - Standard Specification for Performance-Graded Asphalt Binder.
 - 7. AASHTO M324 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
 - 8. AASHTO MP1a - Standard Specification for Performance-Graded Asphalt Binder.
- B. Asphalt Institute:
 - 1. AI MS-2 - Mix Design Methods for Asphalt Concrete and Other Hot- Mix Types.
 - 2. AI MS-19 - Basic Asphalt Emulsion Manual.
 - 3. AI SP-2 - Superpave Mix Design.
- C. ASTM International:
 - 1. ASTM C1371 - Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers.
 - 2. ASTM C1549 - Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer.
 - 3. ASTM D242 - Standard Specification for Mineral Filler for Bituminous Paving Mixtures.
 - 4. ASTM D692 - Standard Specification for Coarse Aggregate for Bituminous Paving Mixtures.
 - 5. ASTM D946 - Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction.
 - 6. ASTM D977 - Standard Specification for Emulsified Asphalt.

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7. ASTM D1073 - Standard Specification for Fine Aggregate for Bituminous Paving Mixtures.
 8. ASTM D1188 - Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples
 9. ASTM D2027 - Standard Specification for Cutback Asphalt (Medium-Curing Type).
 10. ASTM D2397 - Standard Specification for Cationic Emulsified Asphalt.
 11. ASTM D2726 - Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures.
 12. ASTM D2950 - Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods.
 13. ASTM D3381 - Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction.
 14. ASTM D3515 - Standard Specification for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.
 15. ASTM D3549 - Standard Test Method for Thickness or Height of Compacted Bituminous Paving Mixture Specimens.
 16. ASTM D3910 - Standard Practices for Design, Testing, and Construction of Slurry Seal.
 17. ASTM D6690 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
 18. ASTM E408 - Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques.
 19. ASTM E903 - Standard Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres.
 20. ASTM E1918 - Standard Test Method for Measuring Solar Reflectance of Horizontal and Low-Sloped Surfaces in the Field.
 21. ASTM E1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.

1.3 SUBMITTALS

- A. Section 01 33 00 "Submittal Procedures:" Requirements for submittals.
- B. Product Data:
 1. Submit product information for asphalt and aggregate materials.
 2. Submit mix design with laboratory test results supporting design.
- C. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

- A. Mixing Plant: Conform to City of El Paso standard.

1.5 AMBIENT CONDITIONS

- A. Section 01 50 00 "Temporary Facilities and Controls:" Ambient conditions control facilities for product storage and installation.
- B. Do not place asphalt mixture when ambient air or base surface temperature is less than 40 degrees F or surface is wet or frozen.
- C. Place asphalt mixture when temperature is not more than 15 degrees F less than initial mixing temperature.

PART 2 - PRODUCTS

2.1 ASPHALT PAVING

- A. Performance / Design Criteria:
 - 1. Paving: Design for movement of trucks up to 30,000 lbs.
- B. Asphalt Materials:
 - 1. Asphalt Cement: ASTM D3381; viscosity grade AC-10
- C. Aggregate Materials:
 - 1. Coarse Aggregate: ASTM D692; crushed stone, gravel, or blast furnace slag.
 - 2. HMAC to be Type "C", "B", "D" as dictated by thickness shown on plans.

2.2 MIXES

- A. Use dry material to avoid foaming. Mix uniformly.
- B. Asphalt Paving Mixtures: ASTM D3515; designed in accordance with AI MS2.
 - 1. Base Course: Dense Mixture.
 - 2. Binder Course: Open Mixture.
 - 3. Wearing Course: Open Graded Friction Course Mixture.
- C. Paving Surfaces: Minimum solar reflectance index (SRI) of 29, calculated in accordance with ASTM E1980.
 - 1. Reflectance: Measured in accordance with ASTM E903, ASTM E1918, or ASTM C1549.
 - 2. Emittance: Measured in accordance with ASTM E408 or ASTM C1371.

2.3 ACCESSORIES

- A. Sealant: ASTM D6690 Type I; hot applied type.

2.4 SOURCE QUALITY CONTROL

- A. Section 01 40 00 "Quality Requirements:" Testing, inspection and analysis requirements.
- B. Submit proposed mix design for review prior to beginning of Work.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 70 00 "Execution and Closeout Requirements:" Requirements for installation examination.
- B. Verify utilities indicated under paving are installed with excavations and trenches backfilled and compacted.
- C. Verify compacted subgrade and base course is dry and ready to support paving placement loads.
 - 1. Proof roll subbase with a minimum of two perpendicular passes to identify soft spots.
 - 2. Remove soft subbase and replace with compacted fill as specified in Section 31 23 23 "Backfill."
- D. Verify gradients and elevations of base are correct.
- E. Verify manhole frames and valve boxes are installed in correct position and elevation.

3.2 PREPARATION

- A. Prepare subbase in accordance with City of El Paso standards.

3.3 DEMOLITION

- A. Saw cut and notch existing paving as indicated on the drawings.
- B. Clean existing paving to remove foreign material, excess joint sealant and crack filler from paving surface.
- C. Repair surface defects in existing paving to provide uniform surface to receive new paving.

3.4 INSTALLATION

- A. Subbase:
 - 1. Aggregate Subbase: Install as specified in Section 32 11 23.
- B. Primer:
 - 1. Apply primer in accordance with AI MS-2 standards.
- C. Tack Coat:
 - 1. Apply tack coat in accordance with AI MS-19 standards.
 - 2. Apply tack coat to contact surfaces of curbs, and gutters.
 - 3. Coat surfaces of manhole and valve box frames with oil to prevent bond with asphalt paving. Do not tack coat these surfaces.
- D. Single Course Asphalt Paving:
 - 1. Install Work in accordance with City of El Paso standards.
 - 2. Place asphalt within 24 hours of applying primer or tack coat.
 - 3. Place asphalt wearing course to 2 inch compacted thickness indicated on Drawings.
 - 4. Compact paving by rolling to specified density. Do not displace or extrude paving from position. Hand compact in areas inaccessible to rolling equipment.
 - 5. Perform rolling with consecutive passes to achieve an even and smooth finish without roller marks.

3.5 TOLERANCES

- A. Section 01 40 00 "Quality Requirements:" Tolerances.
- B. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.
- C. Scheduled Compacted Thickness: Within +1/4 inch.
- D. Variation from Indicated Elevation: Within 1/2 inch.

3.6 FIELD QUALITY CONTROL

- A. Section 01 40 00 "Quality Requirements:" Requirements for inspecting and testing.

3.7 PROTECTION

- A. Section 01 70 00 "Execution and Closeout Requirements:" Requirements for protecting finished Work.
- B. Immediately after placement, protect paving from mechanical injury for 72 hours or until surface temperature is less than 140 degrees F.

END OF SECTION

SECTION 32 13 13 – CONCRETE PAVING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Furnishing all tools, qualified labor, materials, equipment, qualified superintendence and all services, transportation, other incidentals, assurances and guarantees, assumptions of risk, and responsibility for the performance of all Concrete Flatwork operations as indicated on the Construction Drawings. Complete work as shown and specified herein.
 - 2. Concrete sidewalks, ramps, driveways and monolithic curbs.
 - 3. Concrete pavement structure.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.
 - 2. Section 31 23 23 “Select Fill.”

1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials (AASHTO):
 - 1. AASHTO M324 – Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
- B. American Concrete Institute (ACI):
 - 1. ACI 301 – Specifications for Structural Concrete.
 - 2. ACI 304R – Guide for Measuring, Mixing, Transporting, and Placing Concrete.
- C. American Society for Testing and Materials International (ASTM):
 - 1. ASTM A184/A184M – Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement.
 - 2. ASTM A1064/A1064M – Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
 - 3. ASTM A615/A615M – Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 - 4. ASTM A706/A706M – Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement.
 - 5. ASTM A767/A767M – Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement.
 - 6. ASTM A775/A775M – Standard Specification for Epoxy-Coated Reinforcing Steel Bars.
 - 7. ASTM A884/A884M – Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Fabric for Reinforcement.
 - 8. ASTM A934/A934M – Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars.
 - 9. ASTM C31/C31M – Standard Practice for Making and Curing Concrete Test Specimens in the Field.
 - 10. ASTM C33 – Standard Specification for Concrete Aggregates.
 - 11. ASTM C39 – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
 - 12. ASTM C94/C94M – Standard Specification for Ready-Mixed Concrete.

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13. ASTM C143/C143M – Standard Test Method for Slump of Hydraulic Cement Concrete.
 14. ASTM C150 – Standard Specification for Portland Cement.
 15. ASTM C172 – Standard Practice for Sampling Freshly Mixed Concrete.
 16. ASTM C173/C173M – Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
 17. ASTM C231 – Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
 18. ASTM C260 – Standard Specification for Air-Entraining Admixtures for Concrete.
 19. ASTM C309 – Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 20. ASTM C494 – Standard Specification for Chemical Admixtures for Concrete.
 21. ASTM C595 – Standard Specification for Blended Hydraulic Cements.
 22. ASTM C618 – Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
 23. ASTM C979 – Standard Specification for Pigments for Integrally Colored Concrete.
 24. ASTM C989 – Standard Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars.
 25. ASTM C1017 – Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
 26. ASTM C1064 – Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete.
 27. ASTM C1116 – Standard Specification for Fiber-Reinforced Concrete and Shotcrete.
 28. ASTM C1315 – Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
 29. ASTM C1371 – Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers.
 30. ASTM C1549 – Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer.
 31. ASTM D1751 – Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
 32. ASTM D1752 – Standard Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
 33. ASTM D6690 – Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
 34. ASTM E408 – Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques.
 35. ASTM E903 – Standard Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres.
 36. ASTM E1918 – Standard Test Method for Measuring Solar Reflectance of Horizontal and Low-Sloped Surfaces in the Field.
 37. ASTM E1980 – Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.

1.3 SUBMITTALS

- A. Refer to Section 01 33 00 “ Submittal Procedures.”

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- B. Product Data:
 - 1. Submit proposed mix design for each concrete item for review prior to beginning of work.
 - 2. Submit reinforcing steel product data.
 - C. Materials Source: Submit name of materials source.
 - D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.
 - E. Paving Layout: Submit proposed concrete paving and joint layout to Engineer for review prior beginning of work.

1.4 QUALITY ASSURANCE

- A. Perform work in accordance with ACI 301 and in conformance with City of El Paso Standards.
- B. Obtain cementitious materials from same source throughout.

1.5 REGULATORY REQUIREMENTS

- A. Conform to City of El Paso Standards for paving work on public property.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Do not place concrete when base surface temperature is less than 40 degrees F, or surface is wet or frozen.

PART 2 - PRODUCTS

2.1 MISCELLANEOUS MATERIALS

- A. Form materials:
 - 1. Form materials shall conform to ACI 301.
 - 2. Steel, used or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects.
 - 3. Use flexible spring steel forms or laminated boards to form radius bends as required.
 - 4. Coat forms with a non-staining form release agent that will not discolor or deface concrete.
- B. Reinforcement:
 - 1. Reinforcing Steel: ASTM A615; 60 ksi yield grade; deformed billet steel bars; unfinished finish.
 - 2. Welded Steel Wire Fabric: ASTM A185 / A185M-07; 60 ksi yield grade.
 - 3. Dowels: ASTM A615; 60 ksi yield grade, plain steel, unfinished finish.
- C. Accessories:
 - 1. Refer to Section 32 15 00 – Concrete Curing Compound.
 - 2. Joint Materials: AASHTO M324, ½" bituminous type preformed joint filler.
- D. Tie Bars:
 - 1. 1. Straight deformed steel tie bars. Provide either multiple-piece tie bars or single piece tie bars as shown on Construction Drawings.

2.2 CONCRETE MIX FOR CURBS, SIDEWALKS, DRIVEWAYS, & RAMPS

- A. Mix concrete in accordance with ACI 304. Deliver concrete in accordance with ASTM C94.
- B. Select proportions for normal weight concrete in accordance with ACI 301 Method 3.
- C. Provide concrete to the following criteria:
 - 1. Minimum Water/Cement Ratio: 0.45.
 - 2. Air Entrained: 5 percent (\pm 1 percent).
- D. Use accelerating admixtures in cold weather only when approved by the Project Inspector. Use of admixtures will not relax cold weather placement requirements.
- E. Use calcium chloride only when approved by the Project Inspector.
- F. Use set retarding admixtures during hot weather only when approved by the Project Inspector.

2.3 REINFORCED CONCRETE PAVEMENT MIX

- A. Mix concrete in accordance with ACI 304. Deliver concrete in accordance with ASTM C94.
- B. Concrete mix shall meet the requirements of a TxDOT Class P concrete mix design and shall conform to a Continuously Reinforced Concrete Pavement and Reinforced Concrete Jointed Pavement per TxDOT Standards.
- C. Provide concrete to the following criteria for Continuously Reinforced Concrete Pavement, Reinforced Jointed Concrete Pavement and Colored Concrete Stamped Crosswalks:
 - 1. Compressive Strength: 4,400 psi @ 28 days.
 - 2. Minimum Flexural Strength: 680 psi.
 - 3. Maximum Slump: 4 inches.
 - 4. Air Entrained: 5 percent (\pm 1.5 percent).
- D. Use accelerating admixtures in cold weather only when approved by the city inspector. Use of admixtures will not relax cold weather placement requirements.
- E. Use calcium chloride only when approved by the city inspector.
- F. Use set retarding admixtures during hot weather only when approved by the city inspector.
- G. Refer to Construction Drawings for additional information.

2.4 SOURCE QUALITY CONTROL AND TESTS

- A. Submit proposed mix design to the Engineer and Project Inspector for review and approval prior to commencement of work.
- B. Tests on cement and aggregates shall be performed to ensure conformance with specified requirements.
- C. Test samples in accordance with ACI 301.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify compacted subgrade is acceptable and ready to support paving and imposed loads.
- B. Verify gradients and elevations of base are correct.

3.2 PREPARATION

- A. Moisten base to minimize absorption of water from fresh concrete.
- B. Notify Project Inspector and Engineer a minimum of 24 hours prior to commencement of concreting operations.

3.3 FORMING

- A. Place and secure forms to correct location, dimension, profile, and gradient.
- B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
- C. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

3.4 REINFORCEMENT

- A. Interrupt reinforcement at expansion joints.
- B. Place dowels and reinforcement to achieve pavement and curb alignment as detailed.
- C. Provide doweled joints 12-inch O.C. at transverse joints and interruptions of concrete.

3.5 PLACING CONCRETE

- A. Place concrete by methods that prevent segregation of mix.
- B. Consolidate concrete along face of forms and adjacent to transverse joints with internal vibrator.
- C. Keep vibrator away from joint assemblies, reinforcement, or side forms.
- D. Use only square-faced shovels for hand spreading and consolidation.
- E. Consolidate with care to prevent dislocation of reinforcing, dowels and joint devices.
- F. Use bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- G. Ensure reinforcement, inserts, embedded parts, formed joints are not disturbed during concrete placement.
- H. Place concrete continuously over the full width of the panel and between predetermined construction joints.
- I. Place concrete to pattern indicated.
- J. Deposit and spread concrete in a continuous operation between transverse joints as far as possible.
- K. If interrupted for more than ½-hour, place a construction joint.

3.6 JOINTS

- A. Expansion Joints
 1. Refer to Section 07 92 00 – Joint Sealants.
 2. Place expansion joints at 15-foot intervals or as otherwise noted on Drawings. Align curb, gutter, and sidewalk joints as feasible as possible.
 3. Place joint filler between paving components and building or other appurtenances. Recess top of filler ¼-inch for sealant placement. Refer to Section 07 92 00 “Joint Sealants.”
 4. Provide scored construction shall at least ¼ of the concrete slab thickness. Scored construction joints shall be provided on 10-foot intervals for curb and gutter and 5-foot intervals for sidewalks.
 5. Provide keyed joints as indicated on Drawings.

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6. Provide pre-molded joint filler for expansion joints abutting concrete curbs, structures, walks and other fixed objects, unless otherwise indicated. Refer to Section 07 92 00 "Joint Sealants."
 7. Expansion joints for machine laid curbs shall be provided at changes of direction, at all curb returns, where curb abuts other masonry structures, and where machine starts and stops lying curb.
 8. Furnish joint fillers in one-piece lengths for full width being placed wherever possible, when more than one length is required, or clip joint filler sections together.
 9. Protect top edge of joint filler during concrete placement with a metal cap or other temporary materials.
 10. Remove protection after concrete has been placed on both sides of joint.
- B. Construction Joints
1. Place construction joints at end of placements and at locations where placement operations are stopped for more than ½ hour.
 2. Where load transfer-slip dowel devices are used, install so that one end of each dowel bar is free to move.
- C. Fillers and Sealants
1. Refer to Section 07 92 00 "Joint Sealants."
 2. Where joints in concrete construction are shown to be sealed, the joint sealing compound shall be a cold-applied two-component poly-sulfide sealant.
 3. The handling, mixing, and placing of the material and preparation of the joint prior to sealing shall be in strict accordance with the recommendations of the manufacturer.
 4. A two-component epoxy primer compatible with the sealer shall be used in all joints.
 5. Provide joint sealers and other related materials that are compatible with one another and with joint substrates.

3.7 FINISHING

- A. Concrete Paving: Provide a self-propelled metal tine device equipped with steel tines with cross-section approximately 1/32 in. thick by 1 ½ in. wide. Provide tines for transverse tining equipment spaced at approximately 1 in., center-to-center, or provide tines for longitudinal tining equipment spaced approximately ¾ in. center-to-center. Manual methods that produce and equivalent texture may be used when it is impractical to use self-propelled equipment.
- B. Sidewalk Paving: Light broom, radius to ½-inch radius, and trowel joint edges.
- C. Curbs and Gutters: Light broom.
- D. Direction of Texturing: Transverse to pavement direction.
- E. Inclined Vehicular Ramps: Broom perpendicular to slope.
- F. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.

3.8 CURING AND PROTECTION

- A. A liquid membrane-forming curing compound shall be applied as soon as practical after surface finishing of the concrete surfaces.
- B. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- C. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
- D. Cure floor surfaces in accordance with ACI 308.
- E. Ponding: Maintain 100 percent coverage of water over slab areas continuously for 4-days.
- F. Spraying: Spray water over floor slab areas and keep it wet for 7-days.

3.9 TOLERANCES

- A. Maximum Variation of Surface Flatness: ¼-inch in 10 ft.
- B. Maximum Variation from True Position: ¼-inch.
- C. Steel Bar Placement Tolerance: ¼-inch.

3.10 PATCHING

- A. Allow Engineer to inspect concrete surfaces immediately upon removal of forms.
- B. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Project Inspector upon discovery.
- C. Patch imperfections as directed.

3.11 DEFECTIVE CONCRETE

- A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- B. Repair or replacement of defective concrete shall be determined by the Project inspector.
- C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of the Project inspector for each individual area.

3.12 FIELD QUALITY CONTROL AND TESTING

- A. Request inspection prior to placing concrete paving and flatwork over subgrade materials.
- B. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.
- C. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.
- D. Testing on concrete work shall be performed to ensure conformance with specified requirements. Testing shall conform with the minimum frequency in accordance with ACI 301 and as described below:

Table 3.12.1 – Quality Control for Concrete Work

Test Type	Concrete QA Testing Frequency per ACI Guidelines	Applicable ACI Manual Section
Compressive Strength*	<ul style="list-style-type: none">- 1 Set of 5 Cylinders (6" x 12") every 50 cu. yds. of Concrete Placement- Testing at 7 days (1), 14 days (2), 28 days (2).- Always collect test samples on first 10 yds. of production	ACI 311.5-04, Section 2.3
Flexural Strength*	<ul style="list-style-type: none">- Set of 5 Beams each days production or 1 set per 500 yds min.- Testing at 7 days (1), 14 days (2), 28 days (2).	ACI 311.5-04, Section 2.3
Slumps/* Temperature	<ul style="list-style-type: none">- -1 per 50 yds. of concrete placement + 3 additional randoms during each concrete placement	ACI 311.5-04, Section 2.3

Air Content*	- 1 per 50 yds. of concrete placement + 3 additional randoms during each concrete placement.	ACI 311.5-04, Section 2.3
Thickness* Verification	- During placement by General Contractor and a minimum of 8 cores for each paving lot or at least 2 per subplot.	ACI 311.5 – 04, Section 2.3

**Note: Each paving lot may be defined as 500 cubic yards of concrete placement or less. The concrete strength for final acceptance shall be based on determining the flexural strength of a representative portion of the concrete placement section by correlating the 14-day compressive strength test results to flexural strength.*

- E. The ACI guidelines for hot weather and cold weather concreting should be followed to mitigate the potential poor performance of the concrete materials during significant periods of high (above 95 °F) and low (below 40 °F) temperatures.
- F. Record date, location of pour, quantity, air temperature, and test samples taken.

3.13 PROTECTION

- A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.
- B. Do not permit pedestrian and vehicular traffic over pavement until 75 percent design strength of concrete has been achieved.

END OF SECTION

SECTION 32 28 21 – WROUGHT IRON FENCE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Metallic-coated steel tubular fences.
 - 2. Swing gates.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.

1.2 SUBMITTALS

- A. Include plans, elevations, sections, details, and attachments of fences and gates.
- B. Color selections for polymer finish in the form of manufacturer's color charts, caps, and accessories in the form of actual stamps.
- C. For each fence material and for each color specified.
 - 1. Provide samples 6-inches in length for linear materials.
- D. Welding certificates.

1.3 QUALITY CONTROL

- A. Engage a firm specializing in ornamental fence installation. The installer shall have successfully completed at least five (5) ornamental fence projects of the same materials, design and of similar size and scope to that indicated for this project.
 - 1. Firm Experience: Ten Years
 - 2. Field Foreman Experience: Five Years
- B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code – Steel".
- C. Obtain ornamental fence and gates, including accessories, fittings, and fastenings from a single manufacturer.

PART 2 - PRODUCTS

2.1 STEEL AND IRON

- A. Plates, shapes, and bars: ASTM A 36.
- B. Bars (Pickets): Hot-rolled, carbon steel complying with ASTM A 29, Grade 1010.
- C. Tubing: ASTM A 500, cold formed steel tubing.
- D. Bar grating: NAAMM MBG 531
 - 1. Bars: Hot-rolled steel strip, ASTM A 1011, commercial steel, Type B.
 - 2. Wire Rods: ASTM A 510
- E. Galvanized-Steel Sheet: ASTM A 653, structural quality, Grade 50, with G60 coating.
- F. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792, structural quality, Grade 50, With AZ60 coating.
- G. Castings: Either gray or malleable iron unless otherwise indicated.
 - 1. Gray Iron: ASTM A 48, Class 30.
 - 2. Malleable Iron: ASTM A 47

2.2 DECORATIVE METALLIC-COATED STEEL TUBULAR FENCES

- A. Comply with ASTM F 2408, for industrial application (class) unless otherwise indicated.
- B. Metallic-Coated Steel Sheet: Galvanized-steel sheet or aluminum-zinc alloy-coated steel sheet.
- C. The interior surface of tubes formed from uncoated steel sheet shall be coated with zinc-rich thermosetting coating to comply with ASTM F 2408.
- D. Posts:
 - 1. Fence Posts: Square tubes 1 1/2" by 1/2", 16 gauge, formed from metallic-coated steel sheet or formed from steel sheet hot-dip galvanized after fabrication.
 - 2. Gate Posts: Square tubes 2" by 1", 10 gauge, formed from metallic-coated steel sheet or formed from steel sheet hot-dip galvanized after fabrication.
 - 3. End and Corner Posts: Square tubes 3" by 3" by 3/16" formed from metallic-coated steel sheet or formed from steel sheet hot-dip galvanized after fabrication.
 - 4. Swing Gate Posts: Square tubes 3" by 3" by 3/16" formed from metallic-coated steel sheet or formed from steel sheet hot-dip galvanized after fabrication.
- E. Post Caps: Flat top polyvinyl cap.
- F. Rails:
 - 1. Size: 2 inches by 1 inch, 14-gauge, rectangular tubing.
 - 2. Metallic-coated steel sheet uncoated steel sheet hot-dip galvanized after fabrication.

2.3 STEEL FINISHES

- A. Surface Preparation: Clean surfaces according to SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning".
- B. After cleaning, apply a conversion coating suited to the organic coating to be applied over it.
- C. Color and Gloss: As selected by the Owner from manufacturer's full range.
- D. Primer Application: Apply zinc-rich epoxy primer immediately after cleaning, to provide a minimum dry film thickness of 2 mils per applied coat, to surfaces that will be exposed after assembly and installation, and to concealed surfaces.
- E. Match approved samples for color, texture, and coverage. Remove and refinish or recoat work that does not comply with specified requirements.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 100 feet or line of sight between stakes. Indicate location of utilities, underground structures, benchmarks, and property monuments.

3.2 FENCE INSTALLATION

- A. Install fences according to manufacturer's written instructions.
- B. Install fences by setting posts as indicated and fastening rails and infill panels to posts.
- C. Post Excavation: Drill or hand-excavate holes for posts in firm, undisturbed soil.
- D. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.
- E. Verify that posts are set plumb, aligned, and at correct height and spacing, and held in position during setting with concrete or mechanical devices.

-
- F. Concrete Fill: Place concrete around posts and vibrate or tamp for consolidation. Protect above ground portion of posts from concrete splatter.
 - G. Space posts uniformly at space indicated on Drawings.

3.3 GATE INSTALLATION

- A. Install gates plumb, level and secure for full opening without interference.
- B. Attach hardware by means which will prevent unauthorized removal.
- C. Adjust hardware for smooth operation.

3.4 CLEANING

- A. Clean up debris and unused material and remove it from the site.

3.5 INCIDENTALS

- A. No trespassing/warning signs shall be subsidiary items for wrought iron fence and gate installations.

END OF SECTION

SECTION 35 31 19.20 - ARTICULATING CONCRETE BLOCK

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Installation of the Articulating Concrete Block (ACB) system in accordance with the lines, grades, design and dimensions shown on the Contract Drawings and as specified herein.
- B. Related Requirements:
 - 1. Division 01 Specification Sections apply to Work of this Section.

1.2 REFERENCES

- A. ASTM INTERNATIONAL (ASTM):
 - 1. ASTM D 7277 - Standard Test Method for Performance Testing of Articulating Concrete Block (ACB) Revetment Systems for Hydraulic Stability in Open Channel Flow.
 - 2. ASTM D 6884 - Standard Practice for Installation of Articulating Concrete Block (ACB) Revetment Systems.
 - 3. ASTM D 7276 - Standard Guide for Analysis and Interpretation of Test Data for Articulating Concrete Block (ACB) Revetment Systems in Open Channel Flow.
- B. National Concrete Masonry Association (NCMA).

1.3 SUBMITTAL

- A. The Contractor shall submit to the Engineer of Record (EOR) evidence of full-scale hydraulic testing in accordance with ASTM D 7277, and if necessary, Factor of Safety (FoS) calculations in support of the proposed ACB system stamped and signed by a Professional Engineer licensed to practice in the state where the Project is located. The Contractor shall also submit to the EOR an appropriate geotextile, selected for the site being protected based on the gradation and permeability of the surface soils, which information shall have been provided by the EOR or the designated Geotechnical Engineer.
- B. The Contractor shall furnish manufacturer's certificates of compliance for ACB/mats, revetment cable, geotextile, and any revetment cable fittings and connectors. The Contractor shall also furnish the manufacturer's specifications, literature, preliminary Shop Drawings for the layout of the mats, installation and safety instructions, and any recommendations, if applicable, that are specifically related to the Project. If a color has been specified for the block, the Contractor shall submit a color chart indicating the specified standard color.
- C. Alternative materials from qualified suppliers may be considered; to qualify, proposed alternative suppliers must own and operate their own manufacturing facility, and shall directly employ a minimum of five registered Professional Engineers. Full documentation consistent with the foregoing must be submitted in writing to the EOR a minimum of twenty business days prior to bid date and must be pre-approved in writing as an addendum to the Bid Documents and Drawings by the EOR at least ten business days prior to bid date. Submittal packages must also include, as a minimum, the following:
 - 1. Evidence of satisfactory full-scale laboratory testing in accordance with ASTM D 7277, performed on behalf the submitting manufacturer on a qualifying test flume of

sufficient length for the test flows to achieve normal depth in all cases, and associated engineered calculations quantifying the FoS of the proposed ACB system

under the design conditions of the specific Project, stamped and signed by a registered Professional Engineer residing in and licensed to practice in the state where the Project is located.

2. A list of 5 comparable Projects, in terms of size and applications, in the United States, where the satisfactory performance of the specific alternate ACB system can be verified after a minimum of five years of service life.
3. Information about, or certifications of, all materials associated with the ACB system as detailed above, including (but not limited to) cable, fittings, geotextile, and any other materials required for satisfactory installation in accordance with ASTM D 6884.
4. The names and contact information (phone numbers and e-mail addresses, at a minimum) for the suppliers' representatives, for technical, production or logistics questions, at least one of whom must reside in the state where the Project is located.

PART 2 - PRODUCT

2.1 GENERAL

- A. All ACB mats shall be prefabricated as an assembly of concrete blocks having specific hydraulic capacities and laced with revetment cables. The ACB system may also be assembled on-site by hand-placing the individual units either with or without subsequent insertion of cables.
- B. Individual units in the system shall be staggered and interlocked for enhanced stability. The mats shall be constructed of open and/or closed cell units as shown on the Contract Drawings. The open cell units have two vertical openings of rectangular cross section with sufficient wall thickness to resist cracking during shipping and installation. Parallel strands of cable shall extend through two cable ducts in each block allowing for longitudinal binding of the units within a mat. Each row of units shall be laterally offset by one-half of a block width from the adjacent row so that any given block is cabled to four other blocks (two in the row above and two in the row below). Half-blocks, if used, are always closed-cell units and need not be specified separately as such.
- C. Each block shall incorporate interlocking surfaces that minimize lateral displacement of the blocks within the mats when they are lifted by the longitudinal revetment cables. The interlocking surfaces must not protrude beyond the perimeter of the blocks to such an extent that they reduce the flexibility or articulation capability of the ACB mats or become damaged or broken when the mats are lifted during shipment or placement. Once the mats are in place, the interlocking surfaces shall minimize the lateral displacement of the blocks even if the cables should become damaged or removed. The mats must be able to flex a minimum of 18 degrees between any given row or column of blocks in the uplift direction and 45 degrees in the downward direction.
- D. The cables inserted into the mats shall form lifting loops at one end of the mat with the corresponding cable ends spliced together to form a lifting loop at the other end of the mat. The EOR shall approve appropriate sleeves for use to splice the lifting loop. The cables shall be inserted after sufficient time has been allowed for the concrete to complete the curing process.
- E. The ACB mats shall be placed on a filter fabric as specified herein. Under no circumstances shall the filter fabric be permanently affixed or otherwise adhered to the blocks or mats, i.e., the filter fabric shall be independent of the block system.

- F. Certification (Open-Channel Flow): ACB mats will only be accepted when accompanied by documented hydraulic performance characteristics that are derived from tests under controlled flow conditions. Testing shall conform to ASTM D 7277, as amended and updated. Note that all hydraulic performance testing shall be performed in a 2H:1V flume, and that the tested length be long enough that the test flows achieve normal depth in all cases. Analysis and interpretation of the test data shall conform to the guidance contained in ASTM D 7276, as amended and updated.
- G. Performance (Open-Channel Flow): The design of the ACB mats shall be in accordance with the Factor-of-Safety design methodology as described in "Erosion and Sedimentation" by Pierre Julien, Cambridge University Press, Second Ed. 2010. The minimum designed safety factor shall be 1.5 by utilizing the following equation.

$$SF = ((\vartheta_2 / \vartheta_1) \alpha_0) / ((1 - \alpha_0^2)^{0.5} \cos \beta + \eta (\vartheta_2 / \vartheta_1) + (\vartheta_3 F_d' \cos \delta + \vartheta_4 F_l') / \vartheta_1 W_s) \geq 1.5$$

where $\vartheta_1, \vartheta_2, \vartheta_3, \& \vartheta_4$ are geometric properties of the block, $\alpha_0, \beta, \& \delta$ are angles characteristic of the site and application, η is the stability number for a sloped surface, $F_d \& F_l$ are the drag and lift forces, respectively, and W_s is the submerged weight of the block. Articulating block geometric parameters are available upon request.

- H. The analysis shall be performed based upon the stability of the ACBs due to gravity forces alone, neglecting conservative forces added by cabling, mechanical anchorage, contact with adjacent blocks, or other restraints not attributable to gravity based forces. The analysis must account for a 0.5-inch block projection, in accordance with ASTM D 6884, Section 6.3.3. Site grading requirements may not be used to omit this requirement for standard (non-tapered) block.
- I. To analyze the performance of the unit, the hydraulic information listed below is required:

ACB HYDRAULIC INFORMATION

Design Volumetric Flow Rate (ft ³ /sec)	3
	5
	0
Minimum Shear Stress (lb/ft ²)	4
	.
	6
Channel Friction or Bed Slope (ft/ft)	0
	.
	0
	0
	5
Channel Side Slopes (_H:1V)	5
Channel Bottom Width (ft)	6
Allowable Unit Protrusion (in)	0
	.
	5

2.2 ARTICULATING CONCRETE BLOCKS

- A. Scope: This Specification covers ACB mats used for general erosion control, slope stabilization, channel armoring and channel protection. Installations may be exposed to infrequent and/or light-duty vehicular loading, such as for low-water crossings or boat ramps, by specifying a minimum thickness of 6 inches. Concrete units covered by this specification are made from lightweight or normal weight aggregates, or both. The values stated in U.S. customary units are to be regarded as the standard.
- B. Materials: Cementitious Materials - Materials shall conform to the following applicable ASTM Specifications:
 - 1. Portland Cements - Specification C 150, for Portland Cement.
 - 2. Blended Cements - Specification C 595, for Blended Hydraulic Cements.
 - 3. Hydrated Lime Types - Specification C 207, for Hydrated Lime Types.
 - 4. Pozzolans - Specification C 618, for Fly Ash and Raw or Calcined Natural Pozzolans for use in Portland Cement Concrete.
 - 5. Aggregates: Specification C 33, for Concrete Aggregates, except that grading requirements shall not necessarily apply.
- C. Casting: The ACB units shall be produced using a dry cast method. Dry cast units obtain strength more quickly than wet cast blocks and will also achieve a greater uniformity of quality and greater durability.
- D. Physical Requirements: At the time of delivery to the work site, the ACB units shall conform to the physical requirements prescribed in Table “Physical Requirements (Table 2)” listed below.

PHYSICAL REQUIREMENTS (TABLE 2)

Compressive Strength Net Area		Water Absorption	
Min. p.s.i (mPA)		Max. lb/ft³ (kg/m³)	
Avg. of 3 units	Individual Units	Avg. of 3 units	Individual Unit
4,000 (27.6)	3,500 (24.1)	9.1 (160)	11.7 (192)

- E. Units will be sampled and tested in accordance with ASTM D 6684.
- F. Visual Inspection: All units shall be sound and free of defects which would interfere with the proper placement of the unit, or which would impair the performance of the system. Surface cracks incidental to the usual methods of manufacture, or surface chipping resulting from customary methods of handling in shipment and delivery, shall not be deemed grounds for rejection.
- G. Cracks exceeding 0.25 inches in width and/or 1.0-inch in depth shall be deemed grounds for rejection. Chipping resulting in a weight loss exceeding 10 percent of the average weight of a concrete unit shall be deemed grounds for rejection.
- H. Blocks rejected prior to delivery from the point of manufacture shall be replaced at the manufacturer's expense. Blocks rejected at the job site shall be repaired with structural grout or replaced upon request at the expense of the contractor.
- I. Sampling and Testing: The purchaser (or their authorized representative) shall be accorded access to the relevant manufacturing facility or facilities, if desired, to inspect and/or sample the ACB units from lots ready for delivery prior to release for delivery to the job site. Such inspections are at the sole expense of the requesting entity.
- J. Field installation shall be consistent with the way the system was installed in preparation for hydraulic testing pursuant to ASTM D 7277. Any external restraints, anchors, or other ancillary components (such as synthetic drainage mediums) shall be employed as they were during testing, e.g., if the hydraulic testing installation utilized a drainage layer, then the field

installation must also utilize a drainage layer. This does not preclude the use of other section components for other purposes, e.g., a geogrid for strengthening the subgrade for vehicular loading, or an intermediate filter layer of sand to protect very fine-grained native soils.

- K. Hydraulic testing shall be conducted on the thinnest block in a “family” of similar blocks (i.e., same footprint but different thicknesses), with the tested critical shear value then converted to a critical shear at 0 degrees before extrapolation to thicker blocks within the same family. Such extrapolation may not be made from a thicker block to a thinner block. The extrapolation method is detailed in the (NCMA) “Design Manual for Articulated Concrete Block (ACB) Revetment Systems,” Section 4.2.
- L. Purchaser may request additional testing other than that provided by the manufacturer as needed. Such requested testing will extend any stated lead times for manufacturing and delivery, if the results of such testing are a prerequisite to approval (i.e., approval for release to manufacturing). Costs associated with such testing shall be borne by the purchaser.

2.3 MANUFACTURER

- A. The selected blocks shall have the following nominal characteristics:

STANDARD SIZES OF BLOCKS

CLASS	TYPE	MIN. WEIGHT (BLOCK SIZE			OPEN AREA %
			Length (in)	Width (in)	Height* (in)	
30S	Open	32	13.0	11.6	4.75	20
50S	Open	42	13.0	11.6	6.0	20
45S	Closed	39	13.0	11.6	4.75	10
55S	Closed	50	13.0	11.6	6.0	10
40	Open	59	17.4	15.5	4.75	20
50	Open	76	17.4	15.5	6.0	20
60	Open	93	17.4	15.5	7.5	20
70	Open	113	17.4	15.5	8.5	20
45	Closed	71	17.4	15.5	4.75	10
55	Closed	91	17.4	15.5	6.0	10
75	Closed	112	17.4	15.5	7.5	10
85	Closed	135	17.4	15.5	8.5	10
40L	Open	97	17.4	23.6	4.75	20
50L	Open	115	17.4	23.6	6.0	20
70L	Open	174	17.4	23.6	8.5	20
45L	Closed	109	17.4	23.6	4.75	10
55L	Closed	138	17.4	23.6	6.0	10
85L	Closed	207	17.4	23.6	8.5	10

**Block height may vary based on local manufacture’s capabilities.*

2.4 REVETMENT CABLE AND FITTINGS

- A. Option 1: Polyester Revetment Cable and Fittings: Revetment cable shall be constructed of high tenacity, low elongating, and continuous filament polyester fibers. Cable shall consist of a core construction comprised of parallel fibers contained within an outer jacket or cover. The size of the revetment cable shall be selected such that the minimum acceptable strength

is at least five times that required for lifting of the mats, in accordance with ASTM D 6684, paragraph 5.5.2.

1. Elongation requirements specified below are based upon stabilized new, dry cable. Stabilization refers to a process in which the cable is cycled fifty times between a load 2 corresponding to 200D and a load equal to 10 percent, 20 percent or 30 percent of the cable's approximate average breaking strength. Relevant elongation values are as shown in the table below. The tolerance on these values is ± 5 percent.

ELASTIC ELONGATION	
at Percentage of Break Strength	
10%	20%
	30%
0.6	1.4
	2.2

2. The revetment cable shall exhibit resistance to most concentrated acids, alkalis and solvents. Cable shall be impervious to rot, mildew and degrees radiation associated with marine organisms. The materials used in the construction of the cable shall not be affected by continuous immersion in fresh or salt water.
 3. Selection of cable and fittings shall be made in a manner that ensures a safe design factor for mats being lifted from both ends, thereby forming a catenary. Consideration shall be taken for the bending of the cables around hooks or pins during lifting. Fittings such as sleeves and stops shall be aluminum and washers shall be plastic unless otherwise shown on the Contract Drawings.
- B. Option 2: Galvanized Steel Revetment Cable and Fittings: Revetment cable shall be constructed of preformed galvanized aircraft cable (GAC). The cables shall be made from individual wires and strands that have been formed during the manufacture into the shape they have in finished cable.
1. Cable shall consist of a core construction comprised of seven wires wrapped within seven or nineteen wire strands. The size of the revetment cable shall be selected such that the minimum acceptable strength is at least five times that required for lifting of the mats.
 2. The revetment cable shall exhibit resistance to mild concentrations of acids, alkalis, and solvents. Fittings such as sleeves and stops shall be aluminum, and the washers shall be galvanized steel or plastic. Furthermore, depending on material availability, the cable type (7x7 or 7x19) can be interchanged while always ensuring the required factor of safety for the cable.
 3. Selection of cable and fittings shall be made in a manner that ensures a safe design factor for mats being lifted from both ends, thereby forming a catenary. Consideration shall be taken for the bending of the cables around hooks or pins during lifting. Revetment cable splicing fittings shall be selected so that the resultant splice shall provide a minimum of 75 percent of the minimum rated cable strength.
 - a. ANCHORS
 - 1) The specifying EOR *may* require, at his/her discretion, permanent anchoring of the mats, e.g., using ancillary earth anchors or attachment to other structures using the lifting cable loops, or through the open cells of an open-cell block. The design of the articulating concrete block system is

intended to provide hydraulic stability without the use of such anchors; consequently, any such anchor design shall be by others as approved by the EOR.

- b. FILTER FABRIC
- 1) The geotextile filter shall meet the minimum physical requirements listed in Table “Physical Requirements
 - 2) (Table 3)” of these Specifications. Consultation with the manufacturer is recommended; the standard for sizing geotextile for these applications is AASHTO M-288, Permanent Erosion Control. Either woven or non-woven geotextile are acceptable, if they meet the other Project requirements.
 - 3) The geotextile fiber shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of propylene, ethylene, ester, or amide, and shall contain stabilizers and/or inhibitors added to the base plastic, if necessary, to make the filaments resistant to deterioration due to ultraviolet and heat exposure. The edges of the geotextile shall be finished to prevent the outer fiber from pulling away from the geotextile.
 - 4) The Contractor shall furnish manufacturer's certified test results to the EOR, showing actual test values obtained when the physical properties are tested for compliance with the Specifications.
 - 5) During all periods of shipment and storage, the filter fabric shall be protected from direct sunlight, UV radiation, and temperatures greater than 140 degrees F. To the extent possible, the fabric shall be maintained wrapped in its protective covering. The geotextile shall not be exposed to sunlight or UV radiation until the installation process begins.

PHYSICAL REQUIREMENTS (TABLE 3)

Physical Property	Test Procedure	Minimum Value
Grab Tensile Strength (Unaged Geotextile)	ASTM D4632	<i>IAW AASHTO M288 Class 2</i>
Breaking Elongation (Unaged Geotextile)	ASTM D4632	50% max. (In any principal direction)
Burst Strength	ASTM D3786	<i>IAW AASHTO M288 Class 2</i>
Puncture Strength	ASTM D4833	<i>IAW AASHTO M288 Class 2</i>
A.O.S., U.S. Std. Sieve	ASTM D4751	
Permittivity	ASTM D4491	

- 6) Final acceptance of the filtration geotextile must be made by the EOR based on Project specific soil information. Soil characteristics such as grain size distribution, permeability, and plasticity shall be determined for every 200,000 square feet of geotextile installed or for each source of borrow material used during construction. Significant differences in soil characteristics may require the performance of further sieve and possible hydrometer testing at the discretion of the

EOR. The locations for which the material to be tested is extracted shall be approved by the EOR. The Contractor shall provide the site-specific soil and modified proctor curves for the site soil, at his own expense, to the manufacturer. Also, the contractor shall be responsible for the performance of the test by a certified independent laboratory experienced in performing such test. The test shall be performed under the actual field soil conditions or as otherwise required by the EOR.

- 7) At the time of installation, the filter fabric shall be rejected if it has been removed from its protective cover for over 72 hours or has defects, tears, punctures, flow deterioration, or damage incurred during manufacture, transportation or storage. With the acceptance of the EOR, placing a filter fabric patch over the damaged area prior to placing the mats shall repair a torn or punctured section of fabric. The patch shall be large enough to overlap a minimum of 3 feet in all directions.

c. **SIZE OF ACB MATS**

- 1) General: The concrete blocks, cables and fittings shall be fabricated at the manufacturer or another approved location into mats with a width of up to 8 feet and a length up to 40 feet, which is approved by the EOR. The maximum mat length may be shorter for heavier blocks.
- 2) Mat Length: The ACB mats shall have the ability for fabrication in various lengths, widths, and in combinations of length and/or widths. Special mats are a combination of two opposing dimensions either in the longitudinal or transverse direction of the mats. The special mats are available in various dimensions that allow for a custom fit to a site-specific Project. Obstructions, such as manholes, pipe outfalls, or other fixed structures, will be accommodated to the extent that accurate information is provided about them prior to the preparation of Mat Layout Drawings.

d. **FOUNDATION PREPARATION, GEOTEXTILE AND MAT PLACEMENT**

- 1) Subgrade Preparation:
- 2) General: All subgrade preparation shall be performed in accordance with ASTM D 6884, as updated and amended.
- 3) Grading: The slope shall be graded to a smooth plane surface to ensure that intimate contact is achieved between the slope face and the geotextile (filter fabric), and between the geotextile and the entire bottom surface of the individual ACBs. All slope deformities, roots, grade stakes, and stones which project normal to the local slope face must be re-graded or removed. No holes, "pockmarks," slope board teeth marks, footprints, or other voids greater than 0.5-inch in depth normal to the local slope face shall be permitted. No grooves or depressions greater than 0.5 inches in depth normal to the local slope face with a dimension exceeding 1.0-foot in any direction shall be permitted. Where such

areas are evident, they shall be brought to grade by placing compacted homogeneous material. The slope and slope face shall be uniformly compacted, and the depth of layers, homogeneity of soil, and amount of compaction shall be as required by the EOR.

- 4) Excavation and preparation for all termination trenches or aprons shall be done in accordance with the lines, grades and dimensions shown in the Contract Drawings. The termination trench hinge-point at the top of the slope shall be uniformly graded so that no dips or bumps greater than 0.5 inches over or under the local grade occur. The width of the termination trench hinge-point shall also be graded uniformly to assure intimate contact between all ACBs and the underlying grade at the hinge-point.
- 5) Inspection: Immediately prior to placing the filter fabric and ACB mats, the prepared subgrade shall be inspected by the EOR as well as the Owner's representative. No fabric or blocks shall be placed thereon until that area has been approved by each of these parties.

e. **PLACEMENT OF GEOTEXTILE FILTER FABRIC**

- 1) General. All placement and preparation should be performed in accordance with ASTM D 6884, as updated and amended.
- 2) Filter Fabric, or filtration geotextile, as specified elsewhere, will be placed within the limits of ACBs shown on the Contract Drawings.
- 3) Placement: The filtration geotextile will be placed directly on the prepared area, in intimate contact with the subgrade, and free of folds or wrinkles. The geotextile will not be walked on or disturbed when the result is a loss of intimate contact between the ACB and the geotextile or between the geotextile and the subgrade. The geotextile filter fabric will be placed so that the upstream strip of fabric overlaps the downstream strip. The longitudinal and transverse joints will be overlapped at least 1-1/2 feet for dry installations and at least 3 feet for below-water installations. The geotextile will extend at least 1-foot beyond the top and bottom revetment termination points, or as required by the EOR. If ACBs are assembled and placed as large mattresses, the top lap edge of the geotextile should not occur in the same location as a space between ACB mats unless the space is concrete filled.

f. **PLACEMENT OF ACBS/MATS**

- 1) General: ACB placement and preparation should be performed in accordance with ASTM D 6884, as amended and updated.
- 2) ACB block/mats, as specified in Part 2:A of these Specifications, will be constructed within the specified lines and grades shown on the Contract Drawings.
- 3) Placement: The subgrade shall be prepared in such a manner as to produce a smooth plane surface prior to placement of the ACBs or mats. No individual block within the plane of placed ACBs will protrude more than 1/2-inch or as

otherwise specified by the EOR. ACBs should be flush and develop intimate contact with the subgrade section, as approved by the EOR. Proposed hand placing is only to be used in limited areas, specifically identified by the EOR or manufacturers' Mat Layout Drawings, as approved by the EOR.

- 4) If assembled and placed as large mattresses, the ACB mats will be attached to a spreader bar or other approved device to aid in the lifting and placing of the mats in their proper position using a crane or other approved equipment. The equipment used should have adequate capacity to place the mats without bumping, dragging, tearing or otherwise damaging the underlying fabric. The mats will be placed side-by-side, so that the mats abut each other, and/or end-to-end. Mat seams or openings between mats greater than 2 inches will be backfilled with 4000 psi. non- shrink grout, concrete or other material approved by the EOR. Whether placed by hand or in large mattresses, distinct changes in grade that results in a discontinuous revetment surface in the direction of flow will require backfill at the grade change location to produce a continuous surface.
- 5) Termination trenches will be backfilled and compacted flush with the top of the blocks. The integrity of the trench backfill must be maintained to ensure a surface that is flush with the top surface of the ACBs for its entire service life. Termination trenches will be backfilled as shown on the Contract Drawings. Backfilling and compaction of trenches will be completed in a timely fashion. No more than 500 linear feet of placed ACBs with non-completed termination trenches will be permitted at any time.
- 6) Finishing: The cells or openings in the ACBs will be backfilled and compacted with suitable material, as specified by the EOR. Backfilling and compaction will be completed in a timely manner so that no more than 500 feet of exposed mats exist at any time. Finishing requirements are explicitly at the discretion of the EOR.
- 7) Consultation: The manufacturer of the ACBs/mats shall provide design and construction advice during the design and initial installation phases of the Project when required or as necessary, at the discretion of the EOR. The ACB supplier shall provide, at a minimum, one full day or two half-days of on-site project support upon request.

PART 3 - EXECUTION (Not Used)

END OF SECTION