



ITB 2025-SL01

Marisol (Laguna Madre) Boat Ramp Construction

Sealed Bids must be received before:
2 P.M. Central on 26 June 2025
City of South Padre Island
ATTN: City Secretary
4601 Padre Boulevard South Padre Island, TX 78597

This project was paid for in part with federal funding from the Department of the Treasury through the State of Texas under the Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf of Mexico States Act of 2012 (RESTORE Act). The statements, findings, conclusions, and recommendations are those of the author(s) and do not necessarily reflect the views of the State of Texas or Department of Treasury.

City of South Padre Island – City Secretary
4601 Padre Boulevard, South Padre Island, TX 78597
956-761-8109
www.myspi.org

TABLE OF CONTENTS

INSTRUCTIONS TO BIDDERS.....	3
BID TERMS & CONDITIONS	4
RANKING & EVALUATION CRITERIA	12
CONTRACTOR'S PROPOSAL.....	17
CONTRACTOR'S EXPERIENCE & QUALIFICATIONS	21
CERTIFICATION & ACKNOWLEDGMENT.....	23
GENERAL & SPECIAL CONDITIONS OF AGREEMENT	24
EXHIBIT A: STANDARD FORM OF AGREEMENT.....	27
EXHIBIT B: RESTORE ACT STANDARD TERMS AND CONDITIONS	75
EXHIBIT C: TECHNICAL SPECIFICATIONS.....	142

INSTRUCTIONS TO BIDDERS

Bids are solicited for the **Marisol Boat Ramp Construction** with the following definitions, terms, and conditions of bidding. This bid contains the City's standard contract terms, conditions, and insurance requirements, attached as Exhibit A.

I. NOTICE

Sealed bids are due at 2 P.M. on Thursday, June 26, after which all qualified bids will be opened and publicly read aloud at 4601 Padre Blvd, South Padre Island, Texas 78597. Bids received after the specified deadline will be returned unopened.

Sealed bids shall be clearly marked with the bid number and title and addressed to the City of South Padre Island – City Secretary. Bids shall be delivered using one of the following:

Hand-deliver to:	Mail to:	Ship to (FedEx, UPS, DHL):
4601 Padre Blvd	4601 Padre Blvd.	4601 Padre Blvd.
South Padre Island, TX 78597	South Padre Island, TX 78597	South Padre Island, TX 78597

II. LOCATION AND DESCRIPTION OF PROJECT

The project site is at Seahorse Harbor, located at the southern end of Laguna Boulevard and the western end of West Marisol Drive. The address is 1705 Laguna Boulevard South Padre Island, TX 78597.

This project aims to construct a public boat ramp and ADA ramp with associated truck/trailer parking spaces (both concrete and paver parking lot with header curbs and pavement striping), an attendance dock, a fish cleaning station, exterior light fixtures, landscaping, and the placement of educational signage. Additional related work will generally include clearing, grubbing, removal and disposal of both a section of the existing bulkhead and pavement section to allow for construction of the proposed boat ramp and adjacent bulkhead, and installation of a cofferdam. The work will also include installing water, wastewater, and electrical utilities. All work shall be completed in accordance with the construction plans, specifications, permits, and contract documents. The project is permitted through the US Army Corps of Engineers.

III. PRE-BID CONFERENCE

A Pre-Bid Meeting will be held at 4601 Padre Boulevard, South Padre Island, Texas 78597 at 2 P.M. Central time on Thursday, 12 June 2025. This meeting is not mandatory, but attendance is highly recommended.

IV. COPIES OF BIDDING DOCUMENTS

A complete set of Bidding and Contract Documents will be made available on the City of South Padre Island's website at www.myspi.org or for no charge on a flash drive (or other electronic means) at:

City of South Padre Island

City Secretary's Office

4601 Padre Blvd.

South Padre Island, TX 78597

Vendors may receive notice of bids from the City of South Padre Island from a variety of channels. Approved methods of dissemination include: City of South Padre Island website or the City of South Padre Island City Secretary. The receipt of solicitations through any other means may result in the receipt of incomplete specifications or addenda which could ultimately render your bid non-compliant. City of South Padre Island accepts no responsibility for the receipt or notification of solicitations through any other source.

V. BID SECURITY

A Certified Cashier’s Check or an acceptable Bid Bond in an amount of not less than five (5) percent of the total amount bid, shall accompany each bid proposal.

VI. BONDS

The successful bidder will be required to furnish a Payment Bond and Performance Bond in the amount of the contract. Bidders may not withdraw their Bid Proposal within 60 calendar days of the bid opening date.

VII. QUESTIONS AND INQUIRIES

The deadline for written questions is **Wednesday 18 June 2025 by 2 P.M.** Questions and inquiries about this Solicitation shall be submitted in writing to the following individual:

Manuel Guerra III
Assistant Project Manager
mguerra@lja.com

Bidders shall not attempt to contact City Council members, City staff, or management directly during the pre-proposal or post-proposal period. The City intends to respond to all appropriate questions or concerns; however, the City reserves the right to decline to respond to any question or concern. All material modifications, clarifications, or interpretations will be incorporated into an addendum, which will be posted publicly.

All addenda will be posted on the City’s website at www.myspi.org no later than **5 P.M. Friday, 20 June 2025**. Central time. All addenda issued prior to the due date and time for responses must be incorporated into the RFQ and must be acknowledged in the SOQ response. Only written information provided shall be binding. Oral or other interpretations shall not be binding and are held without legal effect.

VIII. SCHEDULE OF IMPORTANT DATES

The tentative schedule for this Solicitation is as follows:

Release Invitation to Bid Package	27 May 2025
Advertisement Dates	28 May, 04 June 2025
Pre-Bid Conference	12 June 2025 at 2 P.M.
Deadline for Questions and Inquiries	18 June 2025 at 2 P.M.
Latest Addenda Posting	20 June 2025 by 5 P.M.
ITB Due Date	26 June 2025 at 2 P.M.
Earliest Award by City	July 2025

BID TERMS & CONDITIONS

A. DEFINITION OF TERMS

In order to simplify the language throughout this bid, the following definitions and those defined in the Contract Documents shall apply:

BIDDER - A contractor who submits a Bid directly to the City.

BIDDING DOCUMENTS - the Advertisement, Instructions to Bidders, Bid Terms and Conditions, the Proposal, Special Provisions, Technical Specifications, and the proposed Contract Documents (including all Addenda issued prior to the receipt of Bids).

CITY OF SOUTH PADRE ISLAND – Same as City.

CITY COUNCIL – The elected officials of the City of South Padre Island, Texas given the authority to exercise such powers and jurisdiction of all City business as conferred by the State Constitution and Laws.

CONTRACT – An agreement between the City and a Supplier to furnish supplies and/or services over a designated period of time during which repeated purchases are made of the commodity specified.

CONTRACTOR – The successful Bidder(s) of this bid request.

CITY – The government of the City of South Padre Island, Texas.

OWNER – City of South Padre Island.

SUB-CONTRACTOR – Any contractor hired by the Contractor or Supplier to furnish materials and services specified in this bid request.

SUCCESSFUL BIDDER - the lowest, qualified, responsible and responsive Bidder to whom the City (on the basis of the City's evaluation as hereinafter provided) makes an award.

SUPPLIER – Same as Contractor.

B. PRE-BID CONFERENCE

A Pre-Bid Meeting will be held at 4601 Padre Boulevard, South Padre Island, Texas at 2 P.M. Central time on Thursday, 12 June 2025. This meeting is not mandatory, but attendance is highly recommended.

The owner's representatives will be present to discuss the project. Bidders are highly encouraged to attend and participate in the conference. The owner's representative will transmit to all prospective bidders of record such Addenda as they consider necessary in response to questions arising at the conference.

C. GENERAL BID PROVISIONS

1. The Invitation to Bid as advertised will be considered an inclusion of the specifications and conditions.
2. The term "Owner" as used throughout these documents will mean the City of South Padre Island, Texas.
3. Bid proposals will be submitted on the forms provided by Owner. All figures must be written in ink or typewritten. However, mistakes may be crossed out, corrections inserted adjacent thereto and initialed in ink by the person signing the proposal. Do not use a whiteout or other cover products on mistakes.
4. Formal advertised bids indicate date and time by which the bids must be received at the designated location. Bids received after that time will be returned unopened to the bidder.
5. The bidder will note any exceptions to the conditions of this bid. If no exceptions are stated, it will be understood that all general and specific conditions will be complied with, without exception.
6. Bidders may request withdrawal of a posted sealed proposal prior to the scheduled bid opening time, provided the request for withdrawal is submitted to the City of South Padre Island in writing. Owner reserves the right to reject any and all bids by reason of this request.
7. In the event there are inconsistencies between the general provisions and other bid terms or conditions contained herein, the former will take precedence.
8. If it becomes necessary to revise any part of this bid, a written addendum will be provided to all bidders. Owner is not bound by any oral representations, clarifications, or changes made in the

written specifications by Owner's employees, unless such clarification of change is provided to bidders in written addendum form from the City of South Padre Island.

9. All bids will be awarded to the lowest responsible bidder. The determination of the lowest responsible bidder may involve all or some of the following factors: price, conformity to specifications, financial ability to perform the contract, previous performance, facilities and equipment, availability of repair parts, qualifications and experience, delivery promise, payment terms, compatibility as required, other costs, and other objectives and accountable factors which are reasonable.
10. Owner may give an environmental preference to products or services that have a lesser or reduced effect on human health and the environment when compared with competing products and services that serve the same purpose. This comparison may consider raw materials acquisition, product, manufacturing, packaging, distribution, reuse, operation, maintenance, or disposal of the product or service.
11. Bidders may be disqualified, and rejection of proposals may be recommended to the Owner for any (but not limited to) of the following causes: 1) Failure to use the proposal form furnished by the Owner; 2) Lack of signature by an authorized representative on the proposal form; 3) Failure to properly complete the proposal; 4) Evidence of collusion among proposers; 5) Omission of a certified Cashier's Check or Bid Bond proposal guarantee; 6) Unauthorized alteration of bid form; 7) Lack of appropriate qualifications and experience relative to the size and scope of the work proposed; 8) Unsatisfactory performance; 9) Failure to complete projects; or 10) Loaded or unbalanced bids. Owner reserves the right to waive any minor informality or irregularity.
12. Whenever in this invitation, any particular materials, process, and/or equipment are indicated or specified by patent, proprietary or brand name, or by name of manufacture, such wording will be deemed to be used for the purpose of facilitating description of the material, process, and/or equipment desired and will be deemed to be followed by the words "or equal." Contractor shall provide exactly such items in his bid as described, unless approved pursuant to other provisions provided herein.
13. Samples of items shall be furnished, if requested by the Owner, without charge, and if not destroyed, shall be returned upon request at the bidder's expense.
14. It is agreed that the successful bidder will not assign, transfer, convey, or otherwise dispose of the contract or its right, title, or interest in or to the same, or any part thereof, without previous written consent of Owner and any sureties.
15. Contractor must provide audited financial statements, if requested, to the City.
16. Prices in the Bid Proposal shall be presented in the format requested (Unit Price, Lump Sum, etc.)
17. No freight or delivery charges will be accepted unless shown on bid.
18. Owner is exempt from State Retail Tax and Federal Excise Tax. The price bid must be net, exclusive of taxes.
19. All bidders will comply with all Federal, State, and local laws relative to conducting business in the City of South Padre Island. The laws of the State of Texas will govern as to the interpretation, validity, and effect of this bid, its award and any contract entered into.
20. The successful bidder agrees by entering into this contract, to defend, indemnify, and hold Owner harmless from any and all causes of action or claims of damages arising out of or related to bidder's performance under this contract.
21. Advanced disclosures of any information to any particular bidder which gives that particular bidder any advantage over any other interested bidder in advance of the opening of bids, whether in response to advertising or an informal request for bids, made or permitted by a member of the

governing body or an employee or representative thereof, will operate to void all proposals of that particular bid solicitation or request.

22. Minority business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, creed, sex, or national origin in consideration for an award.

D. QUALIFICATIONS OF BIDDERS

To demonstrate qualifications to perform the Work, each Bidder must be prepared to submit within five days of City's request, written evidence, such as financial data, previous experience, present commitments and other such data as may be called for below. Each Bid must contain evidence of the Bidder's qualifications to do business in the State of Texas or covenant to obtain such qualification prior to award of the contract.

In determining a bidder's qualifications, the following factors will be considered:

1. Work previously completed by the bidder and whether the bidder:
 - a. Maintains a permanent place of business,
 - b. Has adequate plant and equipment to do the work properly and expeditiously,
 - c. Has paid or settled all claims for payment promptly,
 - d. Has appropriate technical experience,
 - e. Has job references for work of similar size and scope to the project bid herein; and
 - f. Satisfactory performance and completion of public, or comparable, projects.
2. The safety record of the Bidder, of the corporation, partnership, or institution represented by the Bidder, or of anyone acting for such firm, corporation, or partnership.

Each Bidder may be required to show that he has properly completed similar-type work and that no claims are now pending against such work. No bid will be accepted from any bidder who is engaged in any work that would impair his ability to fully execute, perform, or finance this work.

The General/Sub-Contractors Experience Data Sheet following the proposal must be filled out and submitted with the bid for consideration. Failure to include a completed Data Sheet may result in the rejection of the bid.

E. EXAMINATION OF CONTRACT DOCUMENTS AND SITE

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,
 - 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 Owner's Representative of all conflicts, errors or discrepancies in the Contract Documents.
 - f. Visit with local utilities, including cable companies, and other entities that may have underground or above-ground infrastructure in the work area for infrastructure location.
2. 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 from the Owner's files for its underground facilities and information and data furnished by owners of other underground facilities. Owner does not assume responsibility for the accuracy or completeness thereof.

3. Before submitting a Bid each Bidder will be responsible to make or obtain such explorations, at bidders expense and not to be added into cost of bid if accepted (tests and data concerning 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. 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 or disposal of spoil are to be provided by Contractor. Contractor is responsible for obtaining all permits required for any of the before mentioned purposes prior to beginning work in accordance with the Standard Form of Agreement, Paragraph 35 Permits and Licenses.
5. The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this section, 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 understanding of all terms and conditions for performance and furnishing of the Work. No pleas of ignorance of conditions that may be encountered in their execution of the Work under this contract, that is a result of failure to make the necessary examinations and investigations herein above indicated, will be accepted as an excuse for the failure or omission on the part of the Contractor to fulfill in every detail all the requirements of the Contract Documents. In no event shall a claim for extra compensation or for an extension of time be allowed for failure to thoroughly examine all requirements of Contract Documents.

F. INTERPRETATIONS AND ADDENDA

All questions about the meaning or intent of the Contract Documents are to be directed to the Owner. Interpretations or clarification considered necessary by Owner's Representative in response to such questions will be issued by Addenda and mailed or otherwise delivered to all parties recorded by Owner's Representative as having received the Bidding Documents. Questions received less than 48 hours prior to opening of Bids will not be answered. Only questions answered by a formal written Addenda will be binding. No oral and other interpretations or clarification will be considered official or binding.

Addenda may also be issued to modify the Bidding Documents as deemed advisable by the City.

To properly qualify his bid, each Bidder shall, prior to filing his Bid, check the receipt of all Addenda or letters of clarification issued and acknowledge such receipt on the Proposal Form or on a separate attachment to the bid. Bids without such acknowledgment of all issued Addenda and letters of clarification may cause your bid to be considered non-responsive. Such Addenda and letters of clarification shall become a part of the executed contract and modify the contract documents accordingly.

G. BID SECURITY

Bidders must submit with their Bids a Cashier's Check or a Certified Check in the amount of five (5%) percent of the maximum amount of Bid payable without recourse to the City of South Padre Island, Texas, or a bid bond in the same amount from a surety company holding permit from the State of Texas to act as a surety, as a guarantee that Bidder will enter into a contract and execute bond and

guarantee forms within fifteen (15) days after notice of award of contract. Bids without checks, as stated above, or acceptable bid bond may not be considered.

Bid Security shall be in effect from the opening of the Bid and will be retained until a Bidder has executed the Agreement and furnished the required contract security, whereupon the Bid Security will be returned. A Bidder may withdraw its Bid at any time until the Agreement is signed. However, it will forfeit its Bid Security in doing so if no material mistake was made in the Bid.

The Bid Security of the Successful Bidder will be retained until such Bidder has executed the Agreement and furnished the required contract security, whereupon the Bid Security will be returned. If the Successful Bidder fails to execute and deliver the Agreement and furnish the required contract security within fifteen (15) 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 5 days after the Agreement is executed 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.

H. CONTRACT TIME

The times for Substantial Completion and Final Completion are set forth in the Special Provisions and will be included in the Standard Form of Agreement. It will be necessary for the Successful Bidder to satisfy the City of the Bidder's ability to achieve Substantial Completion and Final Completion within the times designated in the Special Provisions.

I. LIQUIDATED DAMAGES

TIME IS OF THE ESSENCE IN THIS CONTRACT. Failure to meet Substantial or Final Completion dates will result in damages to the city in an amount specified in City's Standard Form of Agreement.

J. SUBSTITUTE OR "OR EQUAL" ITEMS

The materials and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution. No substitution will be considered unless written request for approval has been submitted by the Bidder and has been received by Owner's Representative at least five (5) working days prior to the date for receipt of Bids or until after the contract for the work has been signed. Each such request shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitute including drawings, cuts, performance and test data and any other information necessary for an evaluation. A statement setting forth any changes in other materials, equipment or work that incorporation of the substitute would require shall be included. The burden of proof of the merit of the proposed substitute is upon the Bidder. The Owner's Representative's decision of approval or disapproval of a proposed substitution shall be final. If Owner's Representative approves any proposed substitution before the date for receipt of bids, such approval will be set forth in an Addendum issued to all prospective Bidders. Bidders shall not rely upon approvals made in any other manner.

K. BID FORM

All blanks on the Bid Form must be completed in ink or by typewriter. Unfilled blanks may result in the bid being disqualified.

Any financial amounts written in words will supersede amounts written by numbers in the Bid Form.

Bids by corporations must be executed in the corporate name by the corporate officer authorized to sign for the corporation, accompanied by evidence of authority to sign. The corporate address and state of incorporation must be shown below the signature.

Bids by partnerships must be executed in the partnership name and signed by a partner, whose title must appear under the signature and accompanied by evidence of authority to sign. The fiscal address of the partnership must be shown below the signature.

All names must be typed or printed below the signature.

The Bid shall contain an acknowledgment of receipt of all Addenda. The numbers and dates of which must be filled in on the Bid Form or on a separate attachment to the Bid.

The address and telephone number(s) for communication regarding the Bid must be shown.

All of the data on the GENERAL/SUB-CONTRACTORS EXPERIENCE AND DATA INFORMATION sheet must be completely filled in.

L. SUBMISSION OF BIDS

A Bid shall be submitted at the time and place indicated in the Advertisement. It shall be enclosed in an opaque sealed envelope, marked with the project title, name, and address of the Bidder. The Bid shall be 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.

Each Bidder should, prior to filing their Bid check the receipt of all Addenda or letters of clarification issued and acknowledge such receipt on the outside of the envelope containing his Bid proposal.

M. MODIFICATION AND WITHDRAWAL OF BIDS

Bids may be modified or withdrawn by an appropriate document duly executed, in the described 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.

If prior to the award of the contract by the City Council, any Bidder files a duly signed, written notice with Owner's Representative and promptly thereafter demonstrates to the reasonable satisfaction of Owner's Representative that there was a material mistake in the preparation of his Bid, that Bidder may withdraw his 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.

N. OPENING OF BIDS

Properly prepared Bids will be opened publicly and read aloud. A summary of the amounts of the base Bids and major alternates (if any) will be made available to Bidders after the opening of Bids. A tabulation of the Bids which are read will be available upon request as soon as it has been assembled and verified.

Bids received after the specified time of the opening will be returned unopened.

O. BIDS TO REMAIN SUBJECT TO ACCEPTANCE

All bids will remain subject to acceptance, for 60 days after the date of the Bid opening, but Owner may, in its sole discretion, release any Bid and return the Bid Security prior to that date.

P. AWARD OF CONTRACT

Owner reserves the right to reject any and all Bids, to waive any and all informalities and irregularities not involving price, time, or changes in the Work and to disregard all non-conforming, non-responsive,

unbalanced or conditional Bids. 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 that Bidder, whether because the Bid is not responsive or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by Owner. 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.

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

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. Owner may also 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.

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.

If the contract is to be awarded, it will be awarded to the lowest responsible Bidder whose evaluation by Owner indicates to Owner that the award will be in the best interests of the Project.

If the contract is to be awarded, Owner will give the Successful Bidder a Notice of Award within 60 days after the day of the Bid opening.

Bid prices may be compared after adjusting for differences in the time designated in the Bid for Substantial Completion. The adjusting amount will be determined at the rate set forth in the Standard Form of Agreement for liquidated damages indicated for Substantial Completion for each day after the desired date appearing in City's Standard Form of Agreement.

Q. CONTRACT SECURITY

BOND PROVISIONS of the Standard Form of Agreement (Exhibit A) 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.

R. SIGNING OF AGREEMENT

The successful bidder shall execute the Contract and provide proof of insurance as detailed in the Standard Form of Agreement (Exhibit A) based on Staff recommendation prior to Council action. No later than 15 days of award, all required bonds shall be delivered to Owner. A fully executed contract will be presented to the successful bidder.

S. PERSONAL INTEREST

No employee or City Council Member of the City may have any financial interest, directly or indirectly, in any proposed or existing agreement, purchase, work, sale or service to, for, with or by the City.

T. DISCLOSURE OF INTERESTED PARTIES

Contracting hereunder may require compliance with §2252.908 Texas Government Code/Disclosure of Interested Parties for contracts that (1) require an action or vote by the City Council before the

contract may be signed; or (2) has a value of at least \$1 million. The law provides that a governmental entity may not enter into certain contracts with a business entity unless the business entity submits a disclosure of interested parties to the governmental entity at the time the business entity submits the signed contract to the governmental entity or state agency.

For purposes of this section, the following definitions apply:

“Interested party” means a person who has a controlling interest in a business entity with whom the City contracts or who actively participates in facilitating the contract or negotiating the terms of the contract, including a broker intermediary, advisor, or attorney for the business entity.

"Controlling interest" means: (1) an ownership interest or participating interest in a business entity by virtue of units, percentage, shares, stock, or otherwise that exceeds 10 percent; (2) 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 10 members; or (3) service as an officer of a business entity that has four or fewer officers, or service as one of the four officers most highly compensated by a business entity that has more than four officers.

"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 entity who:

1. Receives compensation from the business entity for the person's participation;
2. Communicates directly with the City on behalf of the business entity regarding the contract; and
3. Is not an employee of the business entity.

The process as implemented by the Texas Ethics Commission (“TEC”) is as follows:

1. The disclosure of interested parties must be performed using the [Texas Ethics Commission’s electronic filing application](#) listing each interested party of which the business entity is aware on Form 1295, obtaining a certification of filing number for this form from the TEC, and printing a copy of it to submit to the City.
2. The copy of Form 1295 submitted to the City must be notarized and contain the unique certification number from the TEC. The form must be filed with the City pursuant to §2252.908 Texas Government Code, “at the time the business entity submits the signed contract” to the City.

The City, in turn, will submit a copy of the disclosure form to the TEC not later than the 30th day after the date the City receives the disclosure of interested parties from the business entity.

RANKING & EVALUATION CRITERIA

Interested bidders shall provide a Competitive Sealed Proposal (CSP) for construction proposal evaluation and contractor selection. The City of South Padre Island will consider the highest valued proposals based on proposed lump sum bid and best qualified bidder. Ranking Criteria is included within this bid package.

The City will evaluate the construction proposal for highest ranked value based on the following criteria. Final determination of the highest valued proposal shall rest with the City Council to be determined at a duly noticed public meeting.

As authorized, the City Council hereby authorizes the initial ranking and evaluation of construction bid proposals for the construction of the Marisol Boat Ramp a delegated evaluation committee. The evaluation committee may consist of the following individuals:

- Shoreline Director
- Coastal Coordinator
- Shoreline Task Force Member(s)
- Public Works Designee
- Project Engineer Representative

The committee shall evaluate, rank, and publish said rankings in accordance with state law. The evaluation criteria and related weights have been established by the committee and are stated below. The committee reserves the right to alter the evaluation criteria and related weights as deemed appropriate, on a case by case basis, as long as said criteria and related weights are published in the bid advertisement process and ranked accordingly.

After the committee has finished ranking the proposals, the committee shall meet with the highest-ranked bidder and attempt to negotiate a construction contract that provides the “best value to the City.” Once the committee and the highest ranked bidder agree on a negotiated price and scope of work, the committee shall forward the negotiated contract amount proposal to the City Manager’s Office for placement on the next available City Council meeting for final consideration of acceptance or rejection.

The City Council shall have the right to approve or reject the ranking committee’s recommendations for a construction contract award. The City Council reserves the right to exclude firms failing to achieve a minimum total score from any further consideration for contract negotiation. Any contract changes to City Council approved construction contracts shall not be permitted without further City Council approval.

During the discussion, evaluation, and ranking process, under no circumstances should any team member try to influence or attempt to pressure other ranking members to change the evaluation scores.

The City reserves the right to apply any and all criteria as deemed appropriate and allowed by state and local law/ordinance, including but not limited to other relevant factors specifically denoted in the bid package. The City requests bidders to answer or provide information regarding the following selection criteria. Questions left unanswered or omitted requested information may result in zero (0) points being awarded.

Criteria	Weight
Price	60 Points
Company Construction Experience	15 Points
Construction Team & Subcontractors	10 Points
Professionalism/Conflict Resolution	10 Points
Construction Performance	15 Points
Total Maximum Points	110 Points

CRITERIA BREAKDOWN

Price (60 Points)

The price will be evaluated and scored based on the main proposal cost. The City reserves the right to include any and all alternate price proposals in the price evaluation process. The established budget will determine which, if any, alternates will be recommended and accepted as part of the overall price ranking

evaluation. After the highest ranked firm is selected, negotiations on price and changes on the scope of work may occur with the firm that provides the best value to the City.

Points will be awarded based upon the total number of offers submitted. The lowest offeror will receive the maximum number of points and the highest offeror will receive the minimum number of points. A point spread system will be established once all the offers are tabulated. The closer the prices of the offers, the larger the point spread will be.

Construction Experience (15 Points)

Scoring for construction experience will be based on the following information provided:

How long has your company been in business?

What is your firm's physical address?

How many coastal development projects has your firm work on and completed similar to the proposed project? Please list projects in chronological order, beginning with the most recent.

List the projects constructed of similar size, type, and complexity to this particular project. Please list projects in chronological order, beginning with the most recent.

Construction Team & Subcontractor (10 Points)

Scoring related to your team and any listed subcontractors will be based on the following information provided:

What Job Superintendent and Project Manager do you anticipate will be working on this project? Please submit resumes of these key individuals with emphasis on job knowledge and experience. If you are not sure who, list two or three potential job superintendents or project managers who will be in charge of this project, with corresponding resumes.

Provide a list of subcontractors to be used on this project. If not sure on certain trades, please list potential alternate subcontractors.

Provide statement of firm's safety record and/or history

Company's Professionalism (10 Points)

Scoring related to professionalism will be based on the following information provided:

How well did the contractor respond to warranty items relating to response time and quality of work?

Was the contractor cooperative and professional in addressing construction issues, such as design conflicts, quality of work issues, pricing change orders, and in resolving other related construction issues?

Was the contractor ever confrontational, defensive, non-responsive, argumentative, or disrespectful throughout the duration of the construction project or bid process?

How well did the contractor work with consulting architects and/or engineers?

Construction Performance (15 Points)

Scoring related to construction performance will be based on the following information provided:

What was the quality of work provided by this contractor?

How timely did the contractor submit all warranty and operations manual documents, and any other related close out documents?

Was the contractor on time in finishing projects as originally projected?

Did the contractor finish punch list items in a reasonable time period?

Did you or have you received any Notice of Liens for non-payment from subcontractors and/or material suppliers on any of your projects with this particular general contractor?

How well did the contractor respond to change order requests, and were the proposed prices fair and reasonable?

Did the contractor hold monthly meetings and document said meetings with appropriate minutes or construction reports?

Score Sheet

The following form shall be used by the ranking committee to score the contractor bids, proposals, and/or statements of qualifications. In the event of a tie or ties, the tiebreaker shall be in favor of the offeror who submitted the lowest price. The alternates shall be used in addition to the base price only if the base price plus the alternate(s) price fall within the project budget. Negotiations on price shall not be allowed until after the City has selected the offeror which is the highest ranked and provides the "best value" to the City, in accordance with the rules and procedures set herein.

Marisol Boat Ramp Construction

Criteria for Selection of Building Contractors

Contractor:
Evaluation Committee Member:
Bid/Proposal Number: ITB 2025-SL01

Ranking Date:
Bid Opening Date: 26 June 2025

CATEGORY	Maximum Points	Points Scored	Total Points Scored
1. PRICE (60 POINTS)			
a. Construction Price	60	_____	_____
2. CONSTRUCTION EXPERIENCE (15 POINTS)			
a. Number of years in business	5	_____	
b. Construction experience	5	_____	
c. Experience in similar size, complexity, and cost of project	5	_____	
		SUBTOTAL	_____
3. CONSTRUCTION TEAM AND SUBCONTRACTORS (10 POINTS)			
a. Project management and Project Superintendent experience	5	_____	
b. Subcontractors experience and reputation	5	_____	
		SUBTOTAL	_____
4. PROFESSIONALISM (10 POINTS)			
a. Firm's professionalism/reputation	5	_____	
b. Conflict resolution performance	5	_____	
		SUBTOTAL	_____
5. CONSTRUCTION PERFORMANCE (15 POINTS)			
a. Quality of work	3	_____	
b. Project documentation	2	_____	
c. History of meeting deadlines	3	_____	
d. Change order pricing	3	_____	
e. Safety record	2	_____	
f. Payment of bills	2	_____	
		SUBTOTAL	_____
GRAND TOTAL	110		_____

CONTRACTOR'S PROPOSAL

Provide all necessary labor, materials, and supplies for the Marisol Boat Ramp Construction. Please use the Proposal/Bid Form on the next pages.

BID SUMMARY

BASE BID SCHEDULE "A" (ITEMS A1-A42) \$ _____

TOTAL number of calendar days to substantial completion _____

ADDENDUM ACKNOWLEDGED _____ DATE _____

ADDENDUM ACKNOWLEDGED _____ DATE _____

ADDENDUM ACKNOWLEDGED _____ DATE _____

Enclosed with the proposal is a cashier's check or bid bond in the amount of \$ _____ (at least 5% of the base bid shown in the proposal).

COMPANY: _____

PHONE: _____

ADDRESS: _____

BY: _____

Signature

Date

Printed Name

Title

BASE BID – SCHEDULE 'A'

I	II	III	IV	V
ITEM	QTY & UNIT	DESCRIPTION	UNIT PRICE	TOTAL
I. GENERAL				
A1	1 LS	Mobilization/Demobilization, Complete in Place per Lump Sum.	\$ _____	\$ _____
A2	1 LS	Traffic Control, Complete in Place per Lump Sum.	\$ _____	\$ _____
A3	1 LS	Storm Water Pollution Prevention Plan, Complete in Place per Lump Sum.	\$ _____	\$ _____
A4	0.88 AC	Site Clearing, Grubbing, and Grading, Complete in Place per Acre.	\$ _____	\$ _____
A5	1 LS	Allowance for Unanticipated Adjustments, Complete in Place per Lump Sum.	\$ <u>100,000.00</u>	\$ <u>100,000.00</u>
II. SITEWORK				
A6	51 LF	Saw Cut and Remove Existing Concrete Bulkhead to Accommodate Boat Ramp Construction, Complete in Place per Linear Foot.	\$ _____	\$ _____
A7	32 SY	Saw Cut and Remove Existing Bituminous Surface, Complete in Place per Square Yard.	\$ _____	\$ _____
A8	1 LS	Cofferdam, Dewatering and Silt Curtain per USACE Nationwide Permit No. SWG-2022-00301, Complete in Place Lump Sum.	\$ _____	\$ _____
A9	2,036 SY	Proposed 6" Reinforced Concrete Pavement Parking Lot per Construction Plans and Specifications, Complete in Place per Square Yard.	\$ _____	\$ _____
A10	133 SY	Proposed 6" Reinforced Concrete Boat Ramp per Construction Plans and Specifications, Complete in Place per Square Yard.	\$ _____	\$ _____
A11	789 SY	Proposed Pavers per Construction Plans and Specifications, Complete in Place per Square Yard.	\$ _____	\$ _____
A12	360 SF	Proposed Wooden Attendant Dock (6'x60') per Construction Plans and Specifications, Complete in Place per Square Foot.	\$ _____	\$ _____
A13	95 SF	Proposed 4" Reinforced Concrete ADA Ramp per Construction Plans and Specifications, Complete in Place per Square Foot.	\$ _____	\$ _____
A14	132 LF	Proposed Reinforced Concrete Bulkhead per Construction Plans and Specifications, Complete in Place per Linear Foot.	\$ _____	\$ _____
A15	36 CY	Proposed Scour Protection Rock Riprap per Construction Plans and Specifications, Complete in Place per Cubic Yards.	\$ _____	\$ _____

BASE BID – SCHEDULE 'A'

I	II	III	IV	V
ITEM	QTY & UNIT	DESCRIPTION	UNIT PRICE	TOTAL
II. SITEWORK (CONT'D)				
A16	9 EA	Proposed Bollards per Construction Plans and Specifications, Complete in Place per Each.	\$ _____	\$ _____
A17	13 EA	Proposed Wheel Stop per Construction Plans and Specifications, Complete in Place per Each.	\$ _____	\$ _____
A18	6 EA	Proposed Parking Lot Signage per Construction Plans and Specifications, Complete in Place per Each.	\$ _____	\$ _____
A19	1 LS	Proposed Parking Lot Striping per Construction Plans and Specifications, Complete in Place per Lump Sum.	\$ _____	\$ _____
A20	1 LS	Proposed Fish Cleaning Structure and Foundation per Construction Plans and Specifications, Complete in Place per Lump Sum.	\$ _____	\$ _____
A21	2 EA	Proposed Fish Cleaning Station per Construction Plans and Specifications, Complete in Place per Each.	\$ _____	\$ _____
A22	38 LF	Proposed 6" Header Curb per Construction Plans and Specifications, Complete in Place per Linear Foot.	\$ _____	\$ _____
III. UTILITIES				
A23	2 EA	Proposed 4" Wastewater Line Service Connection Tie-In with Drop Connection to Existing Wastewater Manhole (4'-6' Depth) per Construction Plans and Specifications, Complete in Place per Each.	\$ _____	\$ _____
A24	54 LF	Proposed 4" ASTM D-3034 PVC (SDR 26) Wastewater Line (4'-6' Depth) per Construction Plans and Specifications, Complete in Place per Linear Foot.	\$ _____	\$ _____
A25	2 EA	Proposed 4" Wastewater End Cap per Construction Plans and Specifications, Complete in Place per Each.	\$ _____	\$ _____
A26	2 EA	Proposed Wastewater Manhole Rim and Cover Adjustment per Construction Plans and Specifications, Complete in Place per Each.	\$ _____	\$ _____
A27	2 EA	Proposed Water Valve Rim and Cover Adjustment per Construction Plans and Specifications, Complete in Place per Each.	\$ _____	\$ _____
A28	2 EA	Proposed Tie-In to New 2" C-900 PVC Waterline to Existing 2" Waterline per Construction Plans and Specifications, Complete in Place per Each.	\$ _____	\$ _____
A29	254 LF	Proposed 2" C-900 PVC (SDR 21) Waterline per Construction Plans and Specifications, Complete in Place per Linear Foot.	\$ _____	\$ _____

BASE BID – SCHEDULE 'A'

I	II	III	IV	V
ITEM	QTY & UNIT	DESCRIPTION	UNIT PRICE	TOTAL
III. UTILITIES (CONT'D)				
A30	3 EA	Proposed 2" x 2" x 2" Tee per Construction Plans and Specifications, Complete in Place per Each.	\$ _____	\$ _____
A31	3 EA	Proposed 2" Water Valve per Construction Plans and Specifications, Complete in Place per Each.	\$ _____	\$ _____
A32	6 EA	Proposed 2" 90° Bend per Construction Plans and Specifications, Complete in Place per Each.	\$ _____	\$ _____
A33	3 EA	Proposed 2" 45° Bend per Construction Plans and Specifications, Complete in Place per Each.	\$ _____	\$ _____
A34	3 EA	Proposed 2" Water Line End Cap per Construction Plans and Specifications, Complete in Place per Each.	\$ _____	\$ _____
A35	1 LS	Proposed Hose Bib per Construction Plans and Specifications, Complete in Place per Lump Sum.	\$ _____	\$ _____
A36	1 LS	Proposed Back Flow Preventer per Construction Plans and Specifications, Complete in Place per Lump Sum	\$ _____	\$ _____
A37	1 LS	Water System Testing and Approval By Laguna Madre Water District, Complete And In Place Per Lump Sum.	\$ _____	\$ _____
A38	254 LF	Trench Safety Related to 2" C-900 PVC Waterline Improvements (All Depths), Complete In Place Per Linear Foot.	\$ _____	\$ _____
A39	54 LF	OSHA Trench Protection For Wastewater Line (All Depths), Complete In Place Per Linear Foot.	\$ _____	\$ _____
A40	1 LS	Proposed Reinforced Concrete Riprap Connecting into Existing Curb Inlet per Construction Plans and Specifications, Complete in Place per Lump Sum.	\$ _____	\$ _____
IV. ELECTRICAL				
A41	1 LS	Electrical Improvements per Construction Plans and Specifications, Complete in Place Lump Sum.	\$ _____	\$ _____
V. LANDSCAPE & IRRIGATION				
A42	1 LS	Landscape & Irrigation Improvements per Construction Plans and Specifications, Complete in Place Lump Sum.	\$ _____	\$ _____
TOTAL BASE BID – SCHEDULE 'A' (ITEMS A1-A42):				\$ _____

The undersigned hereby declares that he/she has visited the site and has carefully examined the plans, specifications and contract documents relating to the work covered by his/her bid or bids, that he/she agrees to do the work, and that no representations made by the City are in any sense a warranty but are mere estimates for the guidance of the Contractor.

CONTRACTOR'S EXPERIENCE & QUALIFICATIONS

Name of Company: _____

Company Years in Business: _____

**List Municipal Projects
(Similar Projects in Size and Scope Completed in Last Five Years)**

Project	Municipality	\$ Amount	Type	Date

Superintendent & Project Manager Information

Include Superintendent proposed for the project, years of experience as superintendent, project manager proposed for the project, and years of experience as project manager.

Superintendent	Years Experience	Projects

Project Manager	Years Experience	Projects

References

Name 5 projects of similar work, giving owner's name, representative's name, project engineer's name, and telephone numbers for each.

1.

_____	_____
_____	_____
_____	_____
_____	_____

2.

_____	_____
_____	_____
_____	_____
_____	_____

3.

_____	_____
_____	_____
_____	_____
_____	_____

4.

_____	_____
_____	_____
_____	_____
_____	_____

5.

_____	_____
_____	_____
_____	_____
_____	_____

CERTIFICATION & ACKNOWLEDGEMENT

The undersigned affirms that they are duly authorized to submit this bid, that this bid has not been prepared in collusion with any other bidder, and that the contents of this bid have not been communicated to any other bidder prior to the official opening of this bid. To the extent this Contract is considered a Contract for goods or services subject to § 2270.002 Texas Government Code, Bidder certifies that it: i) does not boycott Israel; and ii) will not boycott Israel during the term of the Agreement. Additionally, the undersigned affirms that the firm is willing to sign the enclosed Standard Form of Agreement (if applicable).

Signed By: _____ Title: _____

Typed Name: _____ Company Name: _____

Phone No: _____ Fax No: _____

Email: _

Bid Address: _____
P.O. Box or Street City State Zip

Remit Address: _____
P.O. Box or Street City State Zip

Federal Tax ID No: _____

DUNS No: _____

Date: _____

GENERAL & SPECIAL CONDITIONS OF AGREEMENT

A. GENERAL CONDITIONS OF AGREEMENT

The Standard Form of Agreement between Owner and Contractor shall be governing conditions of this contract.

1. STANDARD SPECIFICATIONS FOR CONSTRUCTION--CITY OF SOUTH PADRE ISLAND

- a. **FACILITIES:** All building construction and related installations shall conform to the City's latest adopted editions of the 2018 International Building Code, 2018 International Residential Code without Section R313 (deleted), 2018 International Fire Code without Appendices L and M (deleted), 2018 International Mechanical Code, 2015 International Plumbing Code, 2015 International Fuel Gas Code, 2014 National Electrical Code, 2018 International Energy Conservation Code, 1997 Standard Housing Code, and the 1985 Unsafe Building Abatement Code and all other amendments thereto except as modified by the Code of Ordinances. All other City of South Padre codes and ordinances shall also apply.
- b. **CIVIL CONSTRUCTION:** These specifications shall be used in conjunction with the City of South Padre Island's Standard Specifications of Water and Sewer Construction and Street Construction and is hereby incorporated by reference and those specifically provided for in Chapter 23 of the Code of Ordinances, City of South Padre Island. All City of South Padre codes and ordinances shall apply.

Any discrepancies between the City standards and these specifications shall be clarified per the instructions in Paragraph G, "QUESTIONS AND INQUIRIES," in the Instructions to Bidders section.

B. SPECIAL CONDITIONS OF AGREEMENT

1. **MEASUREMENTS:** All work not specifically set forth as a pay item in the Proposal shall be considered a subsidiary obligation of the Contractor, and all costs in connection therewith shall be included in the various unit prices listed in the Proposal.
2. **QUANTITIES:** Where unit quantities are shown on each bid item of the Proposal, they shall be construed to represent approximate quantities of Work to be completed. Final quantities will be determined by measurement on the site of the completed Work. Work performed outside of specified limits will not be included in final measurement. Bidders are hereby notified that no incidental items of the Work will be paid for unless it is listed in the Proposal form as a pay item.
3. **EXPLOSION, COLLAPSE, AND UNDERGROUND HAZARDS (XCU):** Contracts, where trenching depths exceed twelve (12) feet, shall require additional coverage for the following General Liability hazards:

<u>Explosion</u>	Applies to blasting operations
<u>Collapse</u>	Applies to excavation and grading work adjacent to structure
<u>Underground</u>	Applies to excavation, burrowing, trenching, tunneling, etc. For example, severing an electrical line during excavation operations.

An additional premium may be assessed by contractor's insurance provider. Successful contractor is responsible for assessing depth based on plans and specifications contained herein.

4. **TRAFFIC CONTROL.** When work is performed in or immediately adjacent to a public street right-of-way, the Contractor shall submit to the City Engineer a traffic control plan for each public right-of-way he enters prior to the pre-construction meeting. This plan shall be in conformance to the Texas Manual on Uniform Traffic Control Devices. Once reviewed, the plans will be returned to the Contractor with comments.

Approved Traffic Control Plans shall be in the possession of the contractor on-site during all work within the designated right of way.

5. **MATERIAL STAGING.** Contractor is responsible for identifying and securing a suitable site for the storage of materials and other construction related items unless such a site is specifically identified in the plans.
6. **PERMITS.** Contractor will be required to get permits pursuant to contract documents; however, the City will waive the fees.
7. **STORMWATER PERMIT.** For construction areas disturbing more than one (1) acre of land, Contractor shall provide a Storm Water Pollution Prevention Plan and all related inspections, rain gages, signage, subsidiary to the contract.
8. **SURVEY.** The Owner will provide a one-time survey staking of key construction points, bench marks, horizontal controls, building corners, or utility appurtenances as deemed necessary by the City Engineer. Additional construction staking, or replacement staking, will be at the contractor's expense.
9. **CONTRACTOR PARKING and BATHROOMS.** Unless noted otherwise in the bid documents and plans, the installation of temporary bathroom facilities on the site will not be allowed. Parking for construction related vehicles, worker vehicles, and other equipment may be limited at the construction site. The Contractor should anticipate the need to provide for off-site parking subsidiary to the bid price in the contract.
10. **FIELD OFFICES.** The Contractor will not be required to maintain a field office at the construction site. In the event that the Contractor wishes to have a temporary project office, approval will be required by the Owner. The cost for the installation of all utilities will be paid by the Contractor.
11. **DRAINAGE AND EROSION CONTROLS.** The contractor will be responsible for designing, installing and maintaining interim drainage and erosion controls for the construction site. Surface drainage channels, culverts, or other features will be maintained by the contractor in such a way to minimize the impacts from storm water to offsite properties.
12. **CONTRACT FORMS, BONDS, AND CERTIFICATES.** The Standard Form of Agreement bond forms listed below will be made a part of the executed contract documents and are made a part of these specifications:
 - a. **PERFORMANCE BOND**
 - b. **PAYMENT BOND**These forms are not to be filled in by the bidder at the time of submitting his proposal.
13. **FEDERAL COMPLIMENT.** Bidders will be required to comply with the following items:
 - a. President Executive Order Numbers 11246 and 11375 which prohibit discrimination in employment regarding race, creed, color, sex, or national origin.

- b. Title VI of the Civil Rights Act of 1964 which prohibits discrimination on the basis of race, color, or national origin.
- c. Davis Bacon Act, the Anti-Kickback Act, and the Contract Work Hours Standard Act regarding labor standards for federally assisted construction subagreements.
- d. Bidder must make positive efforts to utilize small and minority owned businesses and women business enterprises.

EXHIBIT A: STANDARD FORM OF AGREEMENT

**STANDARD FORM OF AGREEMENT
CONSTRUCTION SERVICES OVER \$50,000**

This Agreement is entered into by and between the **City of South Padre Island**, a Texas home-rule municipal corporation (the "City"), and _____, a corporation (the "Contractor"), for the construction and/or installation of the **Marisol Boat Ramp**.

1. DEFINITIONS.

- 1.01. Calendar Day. A "calendar day" is any day of the week or month, no days being excepted.
- 1.02. City. Whenever the word "City" is used, it shall mean and be understood as referring to the City of South Padre Island, Texas.
- 1.03. City's Representative. Whenever the words "City's Representative" or "Representative" are used, it shall mean and be understood as referring to the City Manager or his delegate, who shall act as City's agent. The City's Representative may inspect and issue instructions but shall not directly supervise the Contractor.
- 1.04. Contract Amount. The term "Contract Amount" shall mean the amount of Contractor's lump sum base bid proposal, together with all alternates, as accepted by the City in accordance with the Contractor's Proposal. In the case of a unit price contract, Contract Amount shall mean the sum of the product of all unit prices times the respective estimated final quantities of work, for all base bid and alternates, as accepted by the City.
- 1.05. Contract Documents. The term "Contract Documents" shall mean those documents listed in Paragraph 2.01.
- 1.06. Contractor. Whenever the word "Contractor" is used, it shall mean the person(s), partnership, or corporation who has agreed to perform the work embraced in this Agreement and the other Contract Documents.
- 1.07. Extra Work. The term "Extra Work" shall mean and include work that is **not** covered or contemplated by the Contract Documents but that may be required by City's Representative and approved by the City in writing **prior** to the work being done by the Contractor.
- 1.08. Final Completion. The term "Final Completion" shall mean that all the work has been completed, all final punch list items have been inspected and satisfactorily completed, all payments to materialmen and subcontractors have been made, all documentation and warranties have been submitted, and all closeout documents have been executed and approved by the City.
- 1.09. Interpretation of Phrases. Whenever the words "directed", "permitted", "designated", "required", "considered necessary", "prescribed", or words of like import are used, it is understood that the direction, requirement, permission, order, designation, or prescription of City's Representative is intended. Similarly, the words "approved", "acceptable", "satisfactory", or words of like import shall mean approved by, accepted by, or satisfactory to City's Representative.
- 1.10. Nonconforming work. The term "nonconforming work" shall mean work or any part thereof that is rejected by City's Representative as not conforming with the Contract Documents.
- 1.11. Parties. The "parties" are the City and the Contractor.
- 1.12. Project. The term "Project" shall mean and include all that is required to obtain a final product that is acceptable to the City. The term "work" shall have like meaning.

- 1.13. Subcontractor. The term "subcontractor" shall mean and include only those hired by and having a direct contact with Contractor for performance of work on the Project. The City shall have no responsibility to any subcontractor employed by a Contractor for performance of work on the Project, and all subcontractors shall look exclusively to the Contractor for any payments due.
- 1.14. Substantially Completed. The term "Substantially Completed" means that in the opinion of the City's Representative the Project, including all systems and improvements, is in a condition to serve its intended purpose but still may require minor miscellaneous work and adjustment. Final payment of the Agreement Price, including retainage, however, shall be withheld until Final Completion and acceptance of the work by the City. Acceptance by the City shall not impair or waive any warranty obligation of Contractor.
- 1.15. Work. The term "work" as used in this Agreement shall mean and include all that is required herein to obtain a final product that is acceptable to the City. The term "Project" shall have a like meaning. This Project aims to construct a public boat ramp and ADA ramp with associated truck/trailer parking spaces (both concrete and paver parking lot with header curbs and pavement striping), an attendance dock, a fish cleaning station, exterior light fixtures, landscaping, and the placement of educational signage. Additional related work will generally include clearing, grubbing, removal and disposal of both a section of the existing bulkhead and pavement section to allow for construction of the proposed boat ramp and adjacent bulkhead, and installation of a cofferdam. The work will also include installing water, wastewater, and electrical utilities. All work shall be completed in accordance with the construction plans, specifications, permits, and contract documents. The project is permitted through the US Army Corps of Engineers.
- 1.16. Working Day. A "working day" means any day not including Saturdays, Sundays, or legal holidays.

2. CONTACT DOCUMENTS.

- 2.01. The Contract Documents and their priority shall be as follows:
 - (a) This signed Agreement
 - (b) Addendum to this Agreement
 - (c) General Conditions
 - (d) Special Conditions
 - (e) Technical specifications
 - (f) Drawings
 - (g) Instructions to Bidders and any other notices to Bidders or Contractor
 - (h) Performance bond, Payment bonds, Bid bonds and Special bonds
 - (i) Contractor's Proposal
- 2.02. Where applicable, the Contractor will be furnished three (3) sets of plans, drawings, specifications, and related Contract Documents for its use during construction. Plans and specifications provided for use during construction shall be furnished directly to the Contractor only.
- 2.03. The Contractor shall distribute copies of the plans and specifications to suppliers and subcontractors as necessary. The Contractor shall keep one (1) copy of the plans and specifications accessible at the work site with the latest revisions noted thereon. For proper execution of the work contemplated by this Agreement, additional sets of drawings, plans and specifications may be purchased by the Contractor.
- 2.04. All drawings, specifications, and copies thereof furnished by the City shall not be re-used on other work, and with the exception of one (1) copy of the signed Contract Documents, all documents, including sets of the plans and specifications and "as built" drawings, are to be returned to the City on request at the completion of the work. All Contract

Documents, models, mockups, or other representations are the property of the City. In the event of inconsistencies within or between parts of the Contract Documents, the Contractor shall (1) provide the better quality or greater quantity of Work, or (2) comply with the more stringent requirement, either or both in accordance with the City's interpretation. The terms and conditions of this Clause 2.04, however, shall not relieve the Contractor of any of the obligations set forth in Paragraphs 8.01. and 8.02.

3. AWARD OF CONTRACT

- 3.01. Upon the award of the contract by the City Council, the parties shall execute this Agreement, and the Contractor shall deliver to City's Representative all documents, bonds, and certificates of insurance required herein.
- 3.02. **Time is of the essence of this Agreement.** Accordingly, the Contractor shall be prepared to perform the work in the most expedient and efficient possible manner in order to complete the work by the times specified in this Agreement for Substantial Completion and Final Completion. In addition, the Contractor's work on the Project shall be commenced on the date to be specified in the notice to proceed. The notice to proceed may be given by oral notification or set by City's Representative at the post-contract award conference. **The notice to proceed may not be given, nor may any work be commenced, until this Agreement is fully executed and complete, including all required exhibits and other attachments, particularly those required under Paragraphs 27 and 28 (Insurance & Bonds).**
- 3.03. **Contract Amount.** Except in the event of a duly authorized change order approved by the City as provided in this Contract, and in consideration of the Contractor's final completion of all work in conformity with this Contract, the City shall pay the Contractor an amount not to exceed /100 Dollars (\$).

4. CITY'S REPRESENTATIVE

- 4.01. The Contractor shall forward all communications, written or oral, to the City through the City's Representative.
- 4.02. The City's Representative may periodically review and inspect the work of the Contractor.
- 4.03. The City's Representative shall appoint, from time to time, such subordinate supervisors or inspectors as City's Representative may deem proper to inspect the work performed under this Agreement and ensure that said work is performed in accordance with the plans and specifications.
- 4.04. The Contractor shall regard and obey the directions and instructions of City's Representative, any subordinate supervisors or inspectors appointed by the City provided such directions and instructions are consistent with the obligations of this Agreement.
- 4.05. Should the Contractor object to any orders by any subordinate supervisor or inspector, the Contractor may, within two (2) days from receipt of such order, make written appeal to City's Representative for his decision.

5. INDEPENDENT CONTRACTOR

- 5.01. In all activities or services performed hereunder, the Contractor is an independent contractor and not an agent or employee of the City. The Contractor, as an independent contractor, shall be responsible for the final product contemplated under this Agreement. Except for materials furnished by the City, the Contractor shall supply all materials, equipment and labor required for the execution of the work on the Project. The Contractor shall have ultimate control over the execution of the work under this Agreement. The Contractor shall have the sole obligation to employ, direct, control, supervise, manage, discharge, and compensate all of its employees and subcontractors, and the City shall have no control of or supervision over the employees of the Contractor or any of the Contractor's subcontractors except to the limited extent provided for in this Agreement.

- 5.02. The Contractor shall retain personal control and shall give its personal attention to the faithful prosecution and completion of the work and fulfillment of this Agreement. The subletting of any portion or feature of the work or materials required in the performance of this Agreement shall not relieve the Contractor from its obligations to the City under this Agreement. The Contractor shall appoint and keep on the Project during the progress of the work a competent Project Manager and any necessary assistants, all satisfactory to City's Representative, to act as the Contractor's representative and to supervise its employees and subcontractors. All directions given to the Project Manager shall be binding as if given to the Contractor. Adequate supervision by competent and reasonable representatives of the Contractor is essential to the proper performance of the work, and lack of such supervision shall be grounds for suspending the operations of the Contractor and is a breach of this Agreement.
- 5.03. Unless otherwise stipulated, the Contractor shall provide and pay for all labor, materials, tools, equipment, transportation, facilities, and drawings, including engineering, and any other services necessary or reasonably incidental to the performance of the work by the Contractor. It shall be the responsibility of the Contractor to furnish a completed work product that meets the requirements of the City. Any additional work, material, or equipment needed to meet the intent of this specification shall be supplied by the Contractor **without** claim for additional payment, even though not specifically mentioned herein.
- 5.04. Any injury or damage to the Contractor or the Project caused by an act of God, natural cause, a party or entity not privy to this Agreement, or other force majeure shall be assumed and borne by the Contractor.

6. DISORDERLY EMPLOYEES

The Contractor agrees to employ only orderly and competent employees skillful in the performance of the type of work required, and agrees that whenever City's Representative shall inform the Contractor in writing that any person or persons on the work are, in his opinion, incompetent, unfaithful, or disorderly, such person or person shall be discharged from the work and shall not again be re-employed on the site or the Project without City's Representative's written permission.

7. HOURS OF WORK

The Contractor may work Monday through Friday from 7 a.m. to 6 p.m., exclusive of Saturdays, Sundays, or legal holidays. The Contractor may work overtime, weekends, and holidays only when approved in advance by the City's Representative. The time for Substantial Completion shall not be affected in any way by inclusion of this section or by the City's consent or lack of consent to work outside of the times specified in this Agreement.

8. NATURE OF THE WORK

- 8.01. It is understood and agreed that the Contractor has, by careful examination, studied and compared the various Drawings and other Contract Documents, satisfied itself as to the nature and location of the work, the conditions of the ground and soil, the nature of any structures, the character, quality, and quantity of the material to be utilized, the character of equipment and facilities needed for and during the prosecution of the work, the time needed to complete the work, Contractor's ability to meet all deadlines and schedules required by this Agreement, the general and local conditions, including but not limited to weather, and all other matters that in any way affect the work under this Agreement. These obligations are for the purpose of facilitating construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, any errors, inconsistencies or omissions discovered, or which reasonably should have been discovered by the Contractor shall be reported promptly to the City as a request for information in such form as the City may require. However, the Contractor shall not perform any act or do any work on the Project that places the safety

of persons at risk or potentially damages materials or equipment used in the Project, and the Contractor shall do nothing that would render any test or tests erroneous.

- 8.02. Any design errors or omissions noted by the Contractor during this review shall be reported promptly to the City, but it is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional unless otherwise specifically provided in the Contract Documents. The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, building codes, and rules and regulations, but any nonconformity discovered by or which reasonably should have been discovered or made known to the Contractor shall be reported promptly to the City.
- 8.03. If the Contractor fails to perform the obligations of Paragraphs 8.01. and 8.02., the Contractor shall pay such costs and damages to the City as would have been avoided if the Contractor had performed such obligations. The Contractor shall not be liable to the City for damages resulting from errors, inconsistencies or omissions in the Contract Documents or for differences between field measurements or conditions and the Contract Documents unless the Contractor recognized or reasonably should have recognized such error, inconsistency, omission or difference and knowingly failed to report it to the City.

9. POST-AGREEMENT AWARD MEETINGS

- 9.01. Prior to the commencement of the work, the parties shall meet and attend a post-agreement award meeting at the time and place determined by City's Representative. At the post-agreement award meeting, the parties shall meet, discuss, and finalize all schedules, including commencement date, and/or specifications submitted for review. No later than ten (10) days prior to the post-agreement award meeting, the Contractor shall submit to City's Representative the following documents:
- (a) Schedules of work contemplated, including the starting and ending date, as well as an indication of the completion of stages of work hereunder.
 - (b) The names and addresses of all proposed subcontractors in writing.
 - (c) Schedules of the starting and ending dates of subcontractors and the scope of work contemplated for subcontractors.
 - (d) Name, local office, phone number and addresses and, home phone numbers for the Contractor and its Project Superintendent/Manager.
 - (e) For construction projects, four (4) copies of all shop and/or setting drawings or schedules for the submission thereof.
 - (f) Where applicable, materials procurement schedules and material supplier names, addresses and phone numbers.
- 9.02. The City's Representative, within five (5) working days after the initial post-agreement award conference or any other meetings, may submit minutes of the meeting to the Contractor. The Contractor shall thereafter have five (5) working days to review the minutes and make its objections, changes, or reductions thereto in writing. The Contractor shall thereafter sign the minutes and promptly return them to City's Representative. Where there is disagreement, City's Representative will make the final determination.

10. PROGRESS OF WORK

- 10.01. Unless otherwise specifically provided, the Contractor shall prosecute its work at such time and sessions, in such order of precedence, and in such manner as shall be most conducive to the economy of the Project; provided, however, that the order and time of prosecution shall be such that the Project shall be Substantially Completed in accordance with this Agreement, the plans and specifications, and within the time of completion designated in the schedules agreed upon by the parties.
- 10.02. Further, the parties shall be subject to the following:

- (a) The Contractor shall submit a progress schedule and payment schedule of the work contemplated by this Agreement at the initial post-agreement award meeting and subsequent meetings.
 - (b) City's Representative shall be entitled to make objections to the Contractor's schedule submitted herein. The Contractor shall promptly resubmit a revised schedule to City's Representative.
 - (c) The Project Superintendent/Manager shall coordinate its activities with City's Representative. If required by the City, the Contractor shall provide a weekly schedule of planned activities, which may be reviewed on a daily basis.
 - (d) The Contractor shall submit, at such time as may reasonably be requested by City's Representative, additional schedules that shall list the order in which the Contractor proposes to carry on the work with dates at which the Contractor will start the several parts of the work and the estimated dates of completion of the several parts.
 - (e) The Contractor shall attend additional meetings called by City's Representative upon twenty-four (24) hours written notice unless otherwise agreed in writing by the parties.
 - (f) When the City is having other work done, either by agreement or by its own force, City's Representative may direct the time and manner of work done under this Agreement so that conflicts will be avoided and the various work being done by and for the City shall be coordinated.
 - (g) In the event that it is determined by the City that the progress of the work is not in accordance with the approved progress and payment schedule, the City may so inform the Contractor and require the Contractor to take such action as is necessary to insure completion of the Project within the time specified.
- 10.03. The process of approving Contractor's schedules and updates to Contractor's schedules shall not constitute a warranty by the City that any non-Contractor milestones or activities will occur as set out in the Contractor's schedules. Approval of a contractor's schedules does not constitute a commitment by the City to furnish any City-furnished information or material any earlier than the City would otherwise be obligated to furnish that information or material under the Contract Documents. Failure of the Work to proceed in the sequence scheduled by Contractor shall not alone serve as the basis for a Claim for additional compensation or time. In the event there is interference with the Work which is beyond its control, Contractor shall attempt to reschedule the Work in a manner that will hold the additional time and costs beyond its control to a minimum. The Contractor shall monitor the progress of the Work for conformance with the requirements of the construction schedules and shall promptly advise the City of any delays or potential delays. In the event any schedule indicates any delays, the Contractor shall propose an affirmative plan to correct the delay. In no event shall any schedule constitute an adjustment in the Contract Time, any Milestone Date or the Contract Sum unless any such adjustment is agreed to by the City and authorized pursuant to Change Order.
- 10.04. **Work Stoppage.** If in the judgment of either the City or City's Representative any of the work or materials furnished is not in strict accordance with this Agreement or any portion of the work is being performed so as to create a hazardous condition, they may, in their sole discretion, order the work of the Contractor or any sub contractor wholly or partially stopped until any objectionable person, work, or material is removed from the premises. Such stoppage or suspension shall neither invalidate any of the Contractor's performance obligations under this Agreement, including the time of performance and deadlines therefore, nor will any extra charge be allowed the Contractor by reason of such stoppage or suspension.

11. SITE CONDITIONS AND MANAGEMENT

- 11.01. Where the Contractor is working around or in existing structures, it shall verify conditions at the site, including but not limited to, door openings and passages. Any items constructed or manufactured off-site or outside of buildings shall be done so that they are not too bulky for existing facilities. The Contractor shall provide special apparatus as required to handle any such items. All special handling equipment charges shall be at the Contractor's expense. Further, Contractor shall include in its price for the Work, all labor, materials, equipment and/or engineering services required to protect the adjacent properties and/or structures from damage due to performance of the Work.
- 11.02. The Contractor shall be responsible for all power, light, and water required to perform the work.
- 11.03. Throughout the progress of the work, the Contractor shall keep the working area free from debris of all types, and remove from premises all rubbish, resulting from any work being done by him. At the completion of the work, the Contractor shall leave the premises in a clean and finished condition. Any failure to do so may be remedied and charged back to the Contractor.
- 11.04. **Layout of Work.** Except as specifically provided herein, the Contractor shall lay out all work in a manner acceptable to City's Representative in accordance with applicable City of South Padre Island codes and ordinances. City's Representative will review the Contractor's layout of all structures and any other layout work done by the Contractor at the construction meeting, or at the Contractor's request, but this review does not relieve the Contractor of the responsibility of accurately locating all work in accordance with the plans and specifications.
- 11.05. **Lines and Grades.** All lines and grades shall be furnished by the Contractor. Benchmarks and control stakes have been provided by the City's Representative. All benchmarks and control stakes shall be carefully preserved by the Contractor. In case of destruction or removal of the same by the Contractor, its subcontractors, or employees, such stakes, marks, etc. shall be replaced by the Contractor at the Contractor's expense. If the Contractor fails to do so, the City may do so and charge back the Contractor. Additional construction staking as needed for the work, including lines and grades, shall be the sole responsibility of the Contractor, and the Contractor shall receive no extra time or compensation therefor.
- 11.06. **Contractor's Structures.** The building or locating of structures for housing men or the erection of tents or other forms of protection will be permitted only at such places as City's Representative shall permit. The Contractor shall not damage the property where such structures are allowed and shall at all times maintain sanitary conditions in and about such structures in a manner satisfactory to the City. The City may charge the Contractor for any damage or injury to the City, its property, or third persons as a result of the location or use of such structures.
- 11.07. The Contractor and any entity over whom the Contractor has control shall not erect any sign on the Project site without the prior written consent of the City.
- 11.08. City may have other work related to the Project performed at the Project site during the time the Work is performed. Contractor should schedule its Work to coordinate with the work of other contractors and utilities with the understanding that some of that work may be performed at times other than as set out in the Contract Documents or as otherwise anticipated. City will endeavor to have such other work performed so as not to unduly interfere with Contractor's performance when Contractor notifies City of specific reasonable needs well in advance of those needs and where it is possible to do so. Although Contractor should anticipate some delays and interference to its sequence of Work because of work by other contractors and utilities, and will not be entitled to either an extension of time or additional compensation because of them, in the event of substantial delay caused by another contractor or a utility, after advance notice of its needs by Contractor, Contractor will be entitled to make a claim for an extension of time as provided herein.

- 11.09. When two or more contractors, including Contractor, are employed on related or adjacent work or obtain materials from the same material source, or when work must be completed by one contractor before another can begin, each shall conduct his operations in such a manner as not to cause any unnecessary delay or hindrance to the other. Each contractor, including Contractor if applicable, shall be responsible to the other for all damage to work, to persons, or to property caused to the other by his operations, and for loss caused the other due to unreasonable or unjustified delays or failure to finish the work or portions thereof, or furnish materials within the time requested. Should Contractor cause damage to the work or property of any separate contractor at the Project site, or should any claim arising out of Contractor's separate contractor at the Project site, or should any claim arising out of Contractor's performance of the Work at the Project site be made by any separate contractor against Contractor, City or other consultants, or any other person, Contractor shall promptly attempt to settle with such other contractor by agreement, or to otherwise resolve the dispute. **Contractor shall, to the fullest extent permitted by applicable laws, indemnify and hold City harmless from and against all claims, damages, losses and expenses (including, but not limited to, fees of architects, attorneys and other professionals and court costs) arising directly, indirectly or consequentially out of any action, legal or equitable, brought by any separate contractor against City to the extent based on a claim arising out of Contractor's negligence.**

12. MATERIALS

- 12.01. Materials or work described in words that when so applied have well-known technical or trade meaning shall be held to refer to such recognized standards. All work shall be done and all materials furnished in strict conformity with this Agreement, the other Contract Documents, and recognized industry standards. When specific products, systems or items of equipment are referred to in the Contract Documents, any ancillary devices necessary for connecting the products, systems or items of equipment shall also be provided. When standards, codes, manufacturer's instructions and guarantees are required by the Contract Documents, the current edition at the time of Contract execution shall apply, unless another edition is specified in the Contract Documents. References to standards, codes, manufacturer's instructions and guarantees shall apply in full, except (1) they do not supersede more stringent standards set out in the Contract Documents, and (2) any exclusions or waivers that are inconsistent with the Contract Documents do not apply.
- 12.02. All materials shall be approved by the City prior to purchase by the Contractor. Unless otherwise specified herein, the Contractor shall purchase all materials and equipment outright and shall not subject the materials and equipment utilized in the Project to any conditional sales agreement, bailment, lease, or other agreement reserving unto seller any right, title, or interest therein. Title to all materials, but not risk of loss, shall pass to the City upon delivery to the Project.
- 12.03. Where the City deems it necessary to supply materials, it may furnish to the Contractor the list of materials set forth in the attached "List of City Furnished Materials". Upon receipt of said materials, the Contractor shall immediately furnish to the City a written receipt. Moreover, the Contractor shall, on behalf of the City, accept delivery of the materials set forth in the attached "List of Materials Ordered by the City". Under such circumstances, the Contractor shall promptly forward to the City for payment the supplier's invoice together with the Contractor's receipt in writing for such materials.
- (a) Upon acceptance of the materials furnished or ordered by the City, the Contractor warrants that it shall properly handle, transport, store and safeguard the materials.
 - (b) Further, the Contractor shall repair, repaint or replace any and all materials or any part thereof damaged or stolen while in its possession. Such materials are

considered to be in the Contractor's possession from the moment the Contractor either accepts delivery of the materials or signs a receipt accepting delivery of said materials until the Project is accepted by the City's Representative.

- (c) Before transporting any of the materials furnished or ordered by the City, the Contractor shall establish to the City's satisfaction that it has obtained insurance against losses, theft, damage, equal to or greater than the amounts spent by the City in securing said materials. It shall be incumbent upon the Contractor to verify the cost of materials.
 - (d) The City shall not be obligated to furnish materials in excess of the quantities, size, kind, and type set forth in the attached List of City Furnished Materials and List of Materials Ordered by the City. If the City furnishes, and the Contractor accepts, materials in excess thereof, the values of such excess materials shall be their actual cost as stated by the City.
 - (e) Upon delivery, the Contractor shall promptly receive, unload, transport, and handle all materials and equipment on the List of Materials Ordered by the City at its expense and shall be responsible for all shipping costs.
- 12.04. **Materials and supplies shall be new and of good quality.** Upon request, the Contractor shall supply proof of quality and manufacturer. No refurbished, reconditioned, or other previously utilized materials or supplies will be used without the prior signed authorization of City's Representative. The Contractor may utilize substitutes of equal quality and function only upon the prior written authorization of the City's Representative. The City's Representative may require documentation as to quality and function, including manufacturer's specifications, to insure that the proposed substitute is equal to the required material or supply. The City's Representative shall have sole discretion over the use of substitute materials and supplies. Contractor shall bear the risk of any delay in performance caused by submitting substitutions.
- 12.05. Only materials and equipment which are to be used directly in the Work shall be brought to and stored on the Project site by the Contractor. After equipment is no longer required for the Work, it shall be promptly removed from the Project site. Protection of construction material and equipment stored at the Project site from weather, theft, damage and all other perils is solely the responsibility of the Contractor.

13. ENTRY, OBSERVATION, TESTING & POSSESSION

- 13.01. The City reserves the right to enter the Project site or sites by such employee(s) or agent(s) as it may elect for the purpose of inspecting the work. The City further reserves the right to enter the Project site or sites for the purpose of performing such collateral work as the City may desire.
- 13.02. The City's Representative shall have the right, at all reasonable times, to observe and test the work. The Contractor shall make necessary arrangements and provide proper facilities and access for such observation and testing at any location where the work or any part thereof is in preparation or progress. The Contractor shall ascertain the scope of any observation that may be contemplated by City's Representative and shall give ample notice as to the time each part of the work will be ready for observation.
- 13.03. The City's Representative may require Contractor to remove, dismantle, or uncover completed work. If the work is not in accordance with the plans, specifications, or other Contract Documents, the Contractor shall pay the costs of repair and restoration of the work required to be removed, dismantled, or uncovered. Unless Contractor is obligated to provide advance notice of inspection, prior to covering up the work, and fails to do so, if the work is in accordance with the plans, specifications, and other Contract Documents, the City shall pay the costs of repair and restoration of the work.
- 13.04. City shall have the right to take possession of and use any completed or partially completed portions of the Project prior to the time for completing the entire Project or such portions which may not have expired. The parties agree and understand that

possession and use shall not constitute an acceptance of any work not completed in accordance with this Agreement. Further, insurance changes required to keep Contractor's insurance in effect shall be the responsibility of Contractor.

14. REJECTED WORK

- 14.01. All work deemed not in conformity with this Agreement as determined by the City in its sole discretion, may be rejected by the City. City's Representative may reject any work found to be defective or not in accordance with the Contract Documents, regardless of the stage of the work's completion or the time or place of discovery of such defects or inconsistencies and regardless of whether City's Representative has previously accepted the work through oversight or otherwise. Neither observations nor inspections, tests, or approvals made by City's Representative, or other persons authorized under this Agreement to make such observations, inspections, tests, or approvals, shall relieve the Contractor from the obligation to perform the work in accordance with the requirements of this Agreement and the other Contract Documents.
- 14.02. If the work or any part thereof is rejected by the City, it shall be deemed by City's Representative as not in conformity with this Agreement. Any remedial action required, as set forth herein, shall be at the Contractor's expense, as follows:
- (a) The Contractor may be required, at the City's option, after notice from City's Representative, to remedy such work so that it shall be in full compliance with this Agreement. All rejected work or materials shall be immediately replaced in order to conform with this Agreement.
 - (b) If the City deems it inexpedient to correct work damaged or not done in accordance with this Agreement, an equitable deduction from the agreed sum may be made by the City at the City's sole discretion.

15. SUBCONTRACTING & SUBCONTRACTORS

- 15.01. The Contractor agrees that it will retain personal control and will give its personal attention to the fulfillment of this Agreement. The Contractor further agrees that subletting of any portion or feature of the work or materials required in the performance of this Agreement shall not relieve the Contractor from its full obligation to the City as provided by this Agreement.
- 15.02. Subcontractors must be approved by City's Representative prior to hiring or beginning any work on the Project. If City's Representative judges any subcontractor to be failing to perform the work in strict accordance with the drawings and specifications, the Contractor, after due notice, shall discharge the same, but this shall in no way release the Contractor from its obligations and responsibility under this Agreement. Every subcontractor shall be bound by the terms and provisions of this Agreement and the Contract Documents as far as applicable to their work. The Contractor shall be fully responsible to the City for the acts and omissions of its subcontractors. Nothing contained herein shall create any contractual or employment relations between any subcontractor and the City.

16. PAYMENT

- 16.01. The City stipulates that it is an exempt organization as defined by the Limited Sales, Excise and Use Tax Act and, as such, is exempt from the payment of the sales tax on materials and supplies used in the performance of this Contract. The Contractor shall issue exemption certificates to its suppliers and Subcontractors in lieu of said sales tax for all such materials and supplies, and said exemption certificates must comply with the State Comptroller's Ruling No. 95-0.07 and shall be subject to the provision of the State Comptroller's Ruling No. 95-0.09, effective October 1, 1969.
- 16.02. **Progress Payment Applications.** The Contractor shall submit applications for payment as provided for herein. Applications for payment will be processed by City's Representative. Before the first Application for Payment, the Contractor shall submit to the City a schedule

of values allocated to various portions of the Work, prepared in such form and supported by such data to substantiate its accuracy as the City may require. This schedule, unless objected to by the City, shall be used as a basis for reviewing the Contractor's Applications for Payment. On or before the _____ day of each month, the Contractor shall submit to City's Representative, for approval or modification, a statement showing as completely as practicable the total value of the actual work performed by the Contractor and accepted by the City up to and including the last day of the **preceding** month. The statement shall also include the value of all materials not previously submitted for payment which have been delivered to the site but have not yet been incorporated into the work.

- 16.03. **Progress Payments.** On or before the **30th** calendar day following the City's receipt of a progress payment application made in conformity with Paragraph 16.02, the City shall pay to the Contractor the approved amount of the progress payment based on the Contractor's applications for payment, and the recommendation and approval of City's Representative. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage of work completed by the Contractor and approved by the City, but in each case less the aggregate of payments previously made, less retainage, and less amounts as City's Representative shall determine and the City may withhold in accordance with this Agreement. Upon Final Completion, including the delivery of all close out documents, such as "as built" drawings, warranties, guarantees, required additional materials, releases, operation and maintenance manuals, and acceptance of the work in accordance with this Agreement, the City shall pay the remainder of the balance due under this Agreement, less any sums withheld under other terms of this Agreement and less the retainage, which shall be retained for a period of thirty (30) calendar days from the date of Final Completion. Acceptance of retainage by Contractor shall constitute a Waiver and Release of all claims by Contractor.
- 16.04. **Retainage.** From each approved statement, the City shall retain until final payment, ten percent (10%), where the full contract amount is less than \$400,000.00, and five percent (5%), where the full contract amount is \$400,000.00 or more. The City may also retain from each approved statement any other sums authorized under the terms of this Agreement.
- 16.05. If the actual amount of work to be done and the materials to be furnished differ from estimates and where the basis for payment is the unit price method, then payment shall be for the actual amount of accepted work done and materials furnished on the Project.
- 16.06. Reduction in the scope or quantity of work on unit price items shall merely reduce the number of units. In the event that materials have been delivered prior to notice of such reduction, the City will have the option either to pay freight & transportation costs and any re-stocking charges actually incurred by the Contractor or to purchase the materials. The Contractor shall never be entitled to anticipated or lost profits on the deleted or reduced portion of a job, whether bid on a unit price or lump sum basis.
- 16.07. The Contractor shall have the sole obligation to pay any and all charges or fees and give all notices necessary to and incidental to the lawful prosecution of the work hereunder. The Contractor shall not and shall have no authority whatsoever to obligate the City to make any payments to another party nor make any promises or representation of any nature on behalf of the City, without the specific written approval of the City.
- 16.08. The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the City may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.
- 16.09. Unless otherwise provided in the Contract Documents:
(a) Allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

- (b) Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Amount but not in the allowances;
 - (c) Whenever costs are more than or less than allowances, the Contract Amount shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Paragraph 16.9(a) and (2) changes in the Contractor's costs under Paragraph 16.9(b).
- 16.10. **Suspension of Payments.** The City, at any time, may suspend monthly progress payments on the work if it determines that the projected liquidated damages may exceed retainage. The City, at any time, may suspend monthly progress payments if it believes that the Contractor will not complete the work due to actual default or that the Contractor has represented or done some act that indicates that it will not complete the work in accordance with this Agreement or within the time period submitted in its bid. Provided, however, City is in no way obligated to Contractor's surety to withhold payment pursuant to the provisions of this Paragraph.
- 16.11. **Withhold Funds.** Regardless of any bond, the City may, on account of subsequently discovered evidence and in addition to the retainage withheld under Paragraph 16.04, withhold funds or nullify all or part of any acceptance or certificate to such extent as may be necessary to protect itself from loss on account of any of the following, or as otherwise provided in this Agreement:
- (a) Defective work.
 - (b) Claims made or reasonable evidence indicating probable filing of claims by unpaid vendors or other third parties.
 - (c) Failure of the Contractor to make prompt payments to subcontractors for labor or material or materialmen.
 - (d) Claims made or reasonable evidence indicating claims will be made for damage to another by the Contractor.
 - (e) Claims made or reasonable evidence indicating claims will be made for damage to third parties, including adjacent property owners.
 - (f) Claims made or reasonable evidence indicating claims will be made for unremedied damage to property owned by the City.
 - (g) City's determination of an amount of liquidated damages.
 - (h) Charges made for repairs to the Contractor's defective work or repairs made by the City to correct damage to other property.
 - (i) Other amounts authorized under this Agreement or under any other agreement made between City and Contractor.
- Provided, however, City is in no way obligated to Contractor's surety to withhold payment pursuant to the provisions of this Paragraph.

17. EXTRA WORK CHARGES

- 17.01. No changes shall be made, nor will bills for changes, alterations, modifications, deviations, and extra orders be recognized or paid for except upon the written order from authorized personnel of the City.
- 17.02. For "Extra Work", as defined in Paragraph 1.07 and authorized through written change orders, and pursuant to Section 252.048(d) of the Texas Local Government Code, the original contract price may not be increased by more than **twenty-five percent (25%)**. Written change orders that do not exceed **twenty-five percent (25%)** of the original contract amount may be made or approved by the City Manager or his delegate if the change order is less than **Fifty Thousand Dollars (\$50,000.00)**. Changes in excess of **Fifty Thousand Dollars (\$50,000.00)** must be approved by the City Council prior to commencement of the services or work. **Any requests by the Contractor for a change to the Contract Amount shall be made prior to the beginning of the work covered by the proposed change or the right to payment for Extra Work shall be waived.** No course of

conduct or dealings between the parties, nor implied acceptance of alterations or additions to the Work or changes to the Contract schedule shall be the basis for any claim for an increase in compensation or change in time. Any cost incurred by Contractor in connection with any Extra Work shall be included in Contractor's requested change order and Contractor's failure to include any such cost shall act to Waive and Release any claim for such non included cost.

- 17.03. The Contractor shall complete all work as specified or indicated in the Contract Documents. The Contractor shall complete all Extra Work in connection therewith. All work and materials shall be in strict conformity with the specifications. The Substantial Completion of the work shall not excuse the Contractor from performing all the work undertaken, whether of a minor or major nature, and thereby completing the Project in accordance with the Contract Documents. In the event that the Contractor fails to perform the work as required for Substantial Completion or Final Completion, the City may contract with a third party to complete the work and the Contractor shall assume and pay the costs of the performance of the work as contracted.
- (a) It is agreed that the Contractor shall perform all Extra Work under the direction of City's Representative when presented with a written work order signed by City.
 - (b) **No claim for Extra Work of any kind will be allowed unless ordered in writing by the City.** In case any orders or instructions appear to the Contractor to involve Extra Work for which it should receive compensation or an adjustment in the construction time, it shall make written request to City's Representative for a written order from City authorizing such Extra Work.
 - (c) Should a difference of opinion arise as to what does or does not constitute Extra Work, or as to the payment therefor, and the City insists upon its performance, then the Contractor shall proceed with the work after making written requests for written orders in a change order and shall keep adequate and accurate account of the actual field costs therefor, as provided under Method C.
 - (d) It is also agreed that the compensation to be paid to the Contractor for performing Extra Work shall be determined by one or more of the following methods:
 - Method A - By agreed unit prices, or
 - Method B - By agreed lump sum, or
 - Method C - If neither Method A nor Method B is agreed upon before the Extra Work is commenced, then the Contractor shall be paid the actual field cost of the work.
 - (e) **Method A - Unit Prices.** The Contractor agrees to perform Extra Work for the unit prices in the Contractor's Proposal. The Contractor also agrees and warrants that when it is necessary to construct units not shown in the Contract Documents, it shall construct such units for a price arrived at as follows:
 - a. The cost of materials shall be determined by the invoices;
 - b. The cost of labor shall be the reasonable cost thereof, as determined by the City, but in no event shall it exceed an amount determined by calculating the ratio of the total labor costs to the total costs to the total material costs in the section of the Proposal involved, and multiplying the cost of materials for the unit in question by this ratio. Provided, however, that the ratio shall be calculated for only those units that are similar to the new unit for which a price is to be determined.
 - (f) **Method B- Lump Sum.** The lump sum shall be reasonably close to the amount for similar work previously done or combinations of similar units. Invoices for materials used shall be provided in support of the agreed lump sum.
 - (g) **Method C - Actual Field Costs.** The actual field cost is hereby defined to include the cost of all applicable workmen and laborers, as well as materials, supplies, teams, trucks, rentals on machinery and equipment, for the time actually employed or used for such Extra Work, plus actual transportation charges necessarily incurred, together

with other costs reasonably incurred directly on account of such Extra Work, including social security, old age benefits, maintenance bonds, public liability, property damage, worker's compensation, and all other insurance as may be required by law or ordinances or required and agreed to by the City or City's Representative. City's Representative may direct the form in which accounts of the actual field costs shall be kept and records of these accounts shall be made available to City's Representative. Unless otherwise agreed upon, the prices for the use of machinery and equipment shall be determined by using one hundred percent (100%), unless otherwise specified, of the latest schedule of equipment and ownership expenses adopted by the Associated General Contractors of America. Where practical, the terms and prices for the use of machinery and equipment shall be incorporated in the written Extra Work order. Actual field costs shall not exceed the prevailing market price therefor within reasonable tolerances as determined by City's Representative. The amount due to Contractor for costs other than actual field costs shall be calculated in accordance with the following standards:

- a. No indirect or consequential damages will be allowed.
- b. All damages must be directly and specifically shown to be caused by a proven wrong. No recovery shall be based on a comparison by planned expenditures to total actual expenditures or on estimated losses of labor efficiency, or on a comparison of planned manloading to actual manloading, or any other analysis that is used to show damages indirectly.
- c. Damages are limited to extra costs specifically shown to have been directly caused by a proven wrong.
- d. The maximum daily limit on any recovery for delay shall be the amount established by the Contractor for job overhead costs, defined in the pay applications, divided by the total number of days specified for completion called for in the original Contract. Absent an overhead amount in the Schedule of Values, the amount estimated by Contractor for job overhead cost shall be used.

18. TIME OF COMPLETION

- 18.01. The date of beginning, the time for Substantial Completion and Final Completion of work as specified in this Agreement are of the essence of this Agreement.
- 18.02. The work embraced by this Agreement shall be commenced on the date specified in the notice to proceed. Said notice to proceed may be given orally or set by the City's Representative at the post-award conference.
- 18.03. The work shall be Substantially Completed within the time bid, which shall run from the date when the notice to proceed is given by City's Representative. The Contractor bid __ calendar days for the time within which it shall reach Substantial Completion of the Project.
- 18.04. The work shall reach Final Completion and be ready for final payment within **thirty (30) calendar days** from the date of Substantial Completion.

19. SUBSTANTIAL COMPLETION

- 19.01. The Contractor shall notify City's Representative when, in the Contractor's opinion, the contract is Substantially Completed. Within ten (10) calendar days after the Contractor has given City's Representative written notice that the work has been Substantially Completed, City's Representative shall inspect the work for the preparation of a final punch list.
 - (a) If City's Representative and the City find that the work is not Substantially Completed, then they shall so notify the Contractor who shall then complete the work. City's Representative shall not be required to provide a list of unfinished work.

- (b) If the City Representative and City find that the work is Substantially Completed, the City shall issue to the Contractor its certificate of Substantial Completion.
- 19.02. The Substantial Completion of the work shall not excuse the Contractor from performing all of the work undertaken, whether of a minor or major nature, and thereby completing the Project in accordance with the Contract Documents.

20. FINAL COMPLETION

- 20.01. Contractor shall notify the City's Representative when it believes that the work has reached Final Completion as defined in Paragraph 1.08. If the City's Representative and the City accept and deems such work Finally Complete, then Contractor shall be so notified and certificates of completion and acceptance, as provided herein, shall be issued. A complete itemized statement of this Agreement account, certified by the City's Representative as correct, shall then be prepared and delivered to Contractor. Contractor or City, as the case may be, shall pay the balance due as reflected by said statement within thirty (30) calendar days.
- 20.02. The Contractor shall procure all required certificates of acceptance or completions issued by state, municipal, or other authorities and submit the same to the City. The City may withhold any payments due under this Agreement until the necessary certificates are procured and delivered.
- 20.03. Neither the final payment nor any acceptance nor certificate nor any provision of this Agreement shall relieve the Contractor of any responsibility for faulty workmanship or materials. At the option of the City, the Contractor shall remedy any defects and pay for any damage to other work which may appear after final acceptance of the work.

21. DELAYS

- 21.01. The Contractor, in undertaking to complete the work within the times herein fixed, has taken into consideration and made allowance for all hindrances and delays incident to such work, whether growing out of delays in securing material or workmen or delays arising from inclement weather or otherwise.
- 21.02. The City may, in its sole discretion, delay the work during inclement weather in order to preserve the Project, insure safety of work forces, and the preservation of materials and equipment. In such event and upon a written request from the Contractor, the City may grant an extension of time pursuant to Paragraph 22 to offset for such stoppage of the work.
- 21.03. In the event of delays resulting from changes ordered in the work by the City or other delays caused by the City or for the City's convenience, the Contractor may apply to the City for recovery of incidental damages resulting from increased storage costs or other costs necessary to protect the value of the work. In no event shall any consequential or other damages be allowed or any other charges or claims be made by the Contractor for hindrances or delays resulting from any other cause.

22. EXTENSIONS OF TIME

The Contractor has submitted its proposal in full recognition of the time required for the completion of this Project, taking into consideration all factors including, but not limited to the average climatic range and industrial conditions. The Contractor has considered the liquidated damage provision of this Agreement and understands and agrees that it shall not be entitled to, nor will it request, an extension of time for either Substantial Completion or Final Completion, except when the work has been delayed by one or more of the following:

1. An act or neglect of the City, the City's Representative, employees of the City, or other contractors employed by the City;
2. By changes ordered in the work, or reductions thereto approved in writing;

3. By 'rain days with rainfall in excess of one-tenth of an inch during the term of this Agreement that exceed the average number of rain days for such term for this locality, both as determined by the Texas A&M University weather service; or
4. By other causes that the City and the Contractor agree may reasonably justify delay and that were beyond the Contractor's reasonable control and ability to estimate, predict, or avoid, such as delays caused by unforeseen labor disputes, fire, natural disasters, acts of war, and other rare and unpredictable events. This term does **not** include normal delays incident to the delivery of materials, tools, or labor that reasonably could have been predicted and/or accounted for in the Contractor's proposal or decision to bid.

If one or more of the foregoing conditions is present, the Contractor may apply in writing for an extension of time, within thirty (30) days of the occurrence of the event causing the delay, submitting therewith all written justification as may be required by the City's Representative. Within ten (10) calendar days after receipt of a written request for an extension of time, which is supported by all requested documentation, the City shall, in writing and in its sole discretion, grant or deny the request. Under no circumstances shall any extension of time by the City be valid and binding unless it is in writing and in conformity with the other terms of this Agreement.

23. LIQUIDATED DAMAGES

- 23.01. The time for the Substantial and Final Completion of the work described herein are reasonable times for the completion of each, taking into consideration all conditions, including but not limited to the average climatic conditions and usual industrial conditions prevailing in this locality. The amount of liquidated damages for the Contractor's failure to meet the deadlines for Substantial and/or Final Completion are fixed and agreed on by the Contractor because of the impracticability and extreme difficulty in fixing and ascertaining the actual damages that the City would in such an event sustain. The amounts to be charged are agreed to be damages the City would sustain and shall be retained by the City from current periodic estimates for payment or from final payment.
- 23.02. As a result of the difficulty in estimation, calculation and ascertainment of City's damages due to a failure of Contractor to achieve timely completion of the Work, if the Contractor should neglect, fail, or refuse to either Substantially Complete or Finally Complete the work within the time herein specified, or any proper extension thereof granted by the City's Representative pursuant to the terms of Paragraph 22 of this Agreement, then the Contractor does hereby agree as part of the consideration for the awarding of this Agreement that the City may permanently withhold from the Contractor's total compensation the sum of /100 DOLLARS (\$) for each and every calendar day that the Contractor shall be in default after the time stipulated for Substantial Completion and/or Final Completion, not as a penalty, but as liquidated damages for the breach of this Agreement. It being specifically understood that the assessment of liquidated damages may be made for any failure to meet either or both of the deadlines specified for Substantial Completion and/or Final Completion.

24. CHARGERS FOR INJURY OR REPAIR

- 24.01. The Contractor shall be liable for any damages incurred or repairs made necessary by reason of its work and/or caused by it. Repairs of any kind required by the City will be made and charged to the Contractor by the City.
- 24.02. The Contractor shall take the necessary precautions to protect any areas adjacent to its work.
- 24.03. The work specified consists of all work, materials, and labor required by the City to repair any damage to the property of the City, including but not limited to structures, roadways, curbs, parking areas, and sidewalks.

25. WARRANTY

- 25.01. Upon issuance of a certificate of Final Completion, the Contractor warrants for a period of one (1) year as follows:
The Contractor warrants that all materials provided to the City under this Agreement shall be new unless otherwise approved in advance by City's Representative and that all work will be of good quality, free from faults and defects, and in conformance with this Agreement, the other Contract Documents, and recognized industry standards.
- 25.02. All work not conforming to these requirements, including but not limited to unapproved substitutions, may be considered defective.
- 25.03. This warranty is in addition to any rights or warranties expressed or implied by law and in addition to any consumer protection claims arising from misrepresentations by the Contractor.
- 25.04. Where more than a one (1) year warranty is specified for individual products, work, or materials, the longer warranty shall govern.
- 25.05. This warranty obligation shall be covered by any performance or payment bonds tendered in compliance with this Agreement.
- 25.06. **Defective Work Discovered During Warranty Period.** If any of the work is found or determined to be either defective, including obvious defects, or otherwise not in accordance with this Agreement within one (1) year after the date of the issuance of a certificate of Final Completion of the work or a designated portion thereof, whichever is longer, or within one (1) year after acceptance by the City of designated equipment, or within such longer period of time as may be prescribed by law or by the terms of any applicable special warranty required by this Agreement, the Contractor shall promptly correct the defective work at no cost to the City.
- 25.07. After receipt of written notice from the City to begin corrective work, the Contractor shall promptly begin the corrective work. The obligation to correct any defective work shall survive the termination of this Agreement. The guarantee to correct the defective work shall not constitute the exclusive remedy of City, nor shall other remedies be limited to the terms of either the warranty or the guarantee.
- 25.08. If within ten (10) calendar days after the City has notified the Contractor of a defect, failure, or abnormality in the work, the Contractor has not started to make the necessary corrections or adjustments, the City is hereby authorized to make the corrections or adjustments, or to order the work to be done by a third party. The cost of the work shall be paid by the Contractor or its surety.
- 25.09. The cost of all materials, parts, labor, transportation, supervision, special instruments, and supplies required for the replacement or repair of parts and for correction of defects shall be paid by the Contractor or by the surety.
- 25.10. The guarantee shall be extended to cover all repairs and replacements furnished, and the term of the guarantee for each repair or replacement shall be one (1) year after the installation or completion. The one (1) year warranty shall cover all work, equipment, and materials that are part of this Project, whether or not a warranty is specified in the individual section of the Contract Documents that prescribe that particular aspect of the work.

26. PAYMENT OF EMPLOYEES, SUBCONTRACTORS & SUPPLIERS

- 26.01. **Wage Rates.** Pursuant to Section 2258.023(a) of the Texas Government Code, wage rates paid by the Contractor and any subcontractor on this Project shall be not less than the general prevailing rate of per diem wages for work of a similar character in this locality as specified in the schedule of general prevailing rates of per diem wages attached hereto as Exhibit A.

- 26.02. **Statutory Penalty.** Pursuant to Section 2258.023(b) of the Texas Government Code, if the Contractor or any subcontractor violates the requirements of Paragraph 26.01, the Contractor or subcontractor as the case may be shall pay the City **Sixty Dollars (\$60.00)** for each worker employed for each calendar day or part of the day that the worker is paid less than the stipulated wage rates.
- 26.03. The Contractor and each subcontractors shall pay all of their employees engaged in work on the Project in full (less mandatory legal deductions) in cash or by check readily cashable, without discount, no less than once each week.
- 26.04. No later than the seventh (7th) calendar day following the payment of wages, the Contractor must file with City's Representative a certified, sworn, legible copy of such payroll. This shall contain the name of each employee, their classification, the number of hours worked on each day, rate of pay, and net pay. The affidavit shall state that the copy is a true and correct copy of such payroll and that no rebates or deductions (except as shown) have been made or will be made in the future from the wages therein shown.
- 26.05. **Payment of Subcontractors.** The Contractor shall be solely and exclusively responsible for compensating any of the Contractor's employees, subcontractors, materialmen and/or suppliers of any type or nature whatsoever and for insuring that no claims or liens of any type arising out of or incidental to the performance of any services performed pursuant to this Agreement are filed against any property owned by the City. In the event a statutory lien notice is sent to the City, the Contractor shall, where no payment bond covers the work, upon written notice from the City, immediately obtain a bond at its expense and hold the City harmless from any losses that may result from the filing or enforcement of any said lien notice. In the event that the Contractor defaults in the provision of the bond, the City may withhold such funds as are necessary to assure the payment of such claim until litigation determines to whom payment shall be made.
- 26.06. **Affidavit of Bills Paid.** Prior to Final Acceptance of the Project, the Contractor shall provide a notarized affidavit stating that all bills for labor, materials, and incidentals incurred have been paid in full, that any claims from manufacturers, materialmen, and subcontractors have been released, and that there are no claims pending of which the Contractor has been notified.

27. INSURANCE

- 27.01. The Contractor shall procure and maintain at its sole cost and expense for the duration of this Agreement insurance against claims for injuries to persons or damages to property that may arise from or in connection with the performance of the work hereunder by the Contractor, its agents, representatives, volunteers, employees or subcontractors. The policies, coverages, limits and endorsements required are as set forth in Exhibit B.

28. BOND PROVISIONS

- 28.01. Pursuant to Section 2253.021 of the Texas Government Code, for all public works contracts with governmental entities, a payment bond is required if the Contract Amount exceeds \$50,000, and a performance bond is required if the Contract Amount exceeds \$100,000. Below those amounts, the City *may* require payment and/or performance bonds. In the event a performance or payment bond or both is required either by law or in the City's discretion, such bonds shall be executed in accordance with all requirements of Article 7.19-1 of the Texas Insurance Code, all other applicable law, and the following:
- (a) The Contractor shall execute performance and payment bonds for the full Contract Amount.

- (b) The bond surety shall be authorized under the laws of the State of Texas to provide a performance and payment bond and shall have attached proof of authorization of the surety to act in the performance and payment of bonds.
 - (c) The Contractor shall provide original, sealed, and complete counterparts of the executed bonds in the forms required by the Contract Documents, which are attached as Exhibit C, together with valid original powers of attorney, **at the time of execution of this Agreement and prior** to the commencement of work. Copies of the executed bonds shall be attached hereto as **Exhibit C**.
 - (d) The performance and payment bonds shall remain in effect for a period of one (1) year after Final Completion of the work and shall be extended for any warranty work to cover the warranty period.
 - (e) If at any time during the execution of this Agreement in the required period thereafter, the bond or bonds become invalid or ineffective for any reason, the Contractor shall promptly supply within ten (10) days such other bond or bonds, which bond or bonds shall assure performance or payment as required.
- 28.02. The Contractor may make such changes and alterations as the City may require in the work or any part thereof without affecting the validity of this Agreement and any accompanying bond. If such changes or alterations diminish the quantity of the work to be done, they shall not constitute the basis for any claim for damages or anticipated profits. If the City makes changes or alterations that render useless any work already done or material already used in said work, then the City shall compensate the Contractor for any material or labor so used, and for any actual loss occasioned by such change due to actual expenses incurred in preparation for the work as originally planned, in accordance with the provisions of Article 17.

29. SURETY

- 29.01. If the Contractor has abandoned the Project or the City has terminated the contract for cause and the Contractor's Surety, after notice demanding completion is sent, fails to commence the completion of the work in compliance with this Agreement, then the City at its option may provide for completion of the work in either of the following manners:
- 1. The City may employ such force of men and use of instruments, machinery, equipment, tools, materials, and supplies as said the City may deem necessary to complete the work and charge the expense of such labor, machinery, equipment, tools, materials, and supplies to said the Contractor, and the expense so charged shall be deducted and paid by the City out of such monies as may be due or that may thereafter at any time become due to the Contractor and Surety.
 - 2. The City may, after notice published as required by law, accept sealed bids and let this Agreement for the completion of the work under substantially the same terms and conditions that are provided in this Agreement. In case of any increase in cost to the City under the new agreement as compared to what would have been the cost under this Agreement, such increase together with all of the City's damages due to Contractor's abandonment and/or default, including liquidated damages, as provided pursuant to Paragraph 38, entitled "TERMINATION FOR CAUSE" shall be charged to the Contractor and the surety shall be and remain bound therefor. However, should the cost to complete such new agreement prove to be less than that which would have been the cost to complete the work under this Agreement, the Contractor

shall be credited therewith after all deductions are made in accordance with this Agreement.

- 29.02. Should the cost to complete the work exceed the Contract Amount and the Contractor fails to pay the amount due to the City within the time designated and there remains any machinery, equipment, tools, materials, or supplies on the site of the work, notice thereof, together with an itemized list of such equipment and materials, shall be mailed to the Contractor at its respective address designated in this Agreement; provided, however, that actual written notice given in any manner shall satisfy this condition. After mailing, or otherwise giving such notice, such property shall be held at the risk of the Contractor subject only to the duty of City's Representative to exercise ordinary care to protect such property. After fifteen (15) calendar days from the date of said notice, City's Representative may sell such machinery, equipment, tools, materials, or supplies and apply the net sum derived from such sale to the credit of the Contractor. Such sale may be made at either public or private sale, with or without notice, as City's Representative may elect. City's Representative shall release any machinery, equipment, tools, materials, or supplies which remain on the job site and belong to persons other than the Contractor to their proper owners.
- 29.03. In the event the account shows that the cost to complete the work is less than that which would have been the cost to City had the work been completed by the Contractor under the terms of this Agreement, or when the Contractor shall pay the balance shown to be due by them to the City, then all machinery, equipment, tools, materials, or supplies left on the site of the work shall be turned over to the Contractor.

30. COMPLIANCE WITH LAW

- 30.01. The Contractor's work and materials shall comply with all state and federal laws, municipal ordinances, regulations, codes, and directions of inspectors appointed by proper authorities having jurisdiction.
- 30.02. The Contractor shall perform and require all subcontractors to perform the work in accordance with applicable laws, codes, ordinances, and regulations of the State of Texas and the United States and in compliance with OSHA and other laws as they apply to its employees. In the event any of the conditions of the specifications violate the code for any industry, then such code conditions shall prevail.
- 30.03. The Contractor shall follow all applicable state and federal laws, municipal ordinances, and guidelines concerning soil erosion and sediment control throughout the Project and warranty term.

31. SAFETY PRECAUTIONS

- 31.01. All safety measures, policies and precautions at the site are a part of the construction techniques and processes for which the Contractor shall be solely responsible. The Contractor is solely responsible for handling and use of hazardous materials or waste, and informing employees of any such hazardous materials or waste. The Contractor shall provide copies of all hazardous materials and waste data sheets to the South Padre Island Fire Department marked "Attn.: Assistant Chief".
- 31.02. The Contractor has the sole obligation to protect or warn any individual of potential hazards created by the performance of the work set forth herein. The Contractor shall, at its own expense, take such precautionary measures for the protection of persons, property, and the work as may be necessary.
- 31.03. The Contractor shall be held responsible for all damages to property, personal injuries and/or death due to failure of safety devices of any type or nature that

may be required to protect or warn any individual of potential hazards created by the performance of the work set forth herein; and when any property damage is incurred, the damaged portion shall immediately be replaced or compensated for by the Contractor at its own cost and expense.

- 31.04. Contractor agrees that it shall not transport to, use, generate, dispose of, or install at the Project site any Hazardous Substance (as defined in Paragraph 31.07, except in accordance with applicable Environmental Laws. Further, in performing the Work, Contractor shall not cause any release of Hazardous Substances into, or contamination of, the environment, including the soil, the atmosphere, any water course or ground water, except in accordance with applicable Environmental Laws (as hereafter defined at Paragraph 31.07). **In the event Contractor engages in any of the activities prohibited in this Paragraph 31.04 to the fullest extent permitted by law, Contractor hereby indemnifies and holds City and all of its respective officials, agents and employees harmless from and against any and all claims, damages, losses, causes of action, suits and liabilities of every kind, including, but not limited to, expenses of litigation, court costs, punitive damages and attorneys' fees, arising out of, incidental to or resulting from the activities prohibited in this Paragraph 31.04.**
- 31.05. In the event Contractor encounters on the Project site any Hazardous Substance, or what Contractor may reasonably believe to be a Hazardous Substance, and which is being introduced to the Work, or exists on the Project site, in a manner violative of any applicable Environmental Laws, Contractor shall immediately stop work in the area affected and report the condition to City in writing. The Work in the affected area shall not thereafter be resumed except by written authorization of City if in fact a Hazardous Substance has been encountered and has not been rendered harmless. In the event Contractor fails to stop the Work upon encountering a Hazardous Substance at the Project site, **to the fullest extent permitted by law, Contractor hereby indemnifies and holds City and all of its officials, agents and employees harmless from and against any and all claims, damages, losses, causes of action, suits and liabilities of every kind, including, but not limited to, expenses of litigation, court costs, punitive damages and attorneys' fees, arising out of, incidental to or resulting from Contractor's failure to stop the Work.**
- 31.06. City and Contractor may enter into a separate agreement and/or Change Order for Contractor to remediate and/or render harmless the Hazardous Substance, but Contractor shall not be required to remediate and/or render harmless the Hazardous Substance absent such agreement. Contractor shall not be required to resume work in any area affected by the Hazardous Substance until such time as the Hazardous Substance has been remediated and/or rendered harmless.
- 31.07. For purposes of this Agreement, the term "Hazardous Substance" shall mean and include any element, constituent, chemical, substance, compound, or mixture, which are defined as a hazardous substance by any local, state or federal law, rule, ordinance, by-law, or regulation pertaining to environmental regulation, contamination, clean-up or disclosure, including, without limitation, The Comprehensive Environmental Response, Compensation and Liability Act of 1980 ("CERCLA"), The Resource Conservation and Recovery Act ("RCRA"), The Toxic Substances Control Act ("TSCA"), The Clean Water Act ("CWA"), The Clean Air Act ("CAA"), and the Marine Protection Research and Sanctuaries Act ("MPRSA"), The Occupational Safety and Health Act ("OSHA"), The Superfund Amendments and Reauthorization Act of 1986 ("SARA"), or other state superlien or environmental clean-up or disclosure statutes including all state and local counterparts of such laws (all such laws, rules and regulations being referred to collectively as "Environmental Laws"). It is the Contractor's responsibility to comply with this

Paragraph 31.07 based on the law in effect at the time its services are rendered and to comply with any amendments to those laws for all services rendered after the effective date of any such amendments.

32. TRENCH SAFETY

The Contractor must comply with Texas law regarding trench excavation exceeding five feet in depth and in accordance with the following items:

- 32.01. The Contractor must comply with the requirements of Tex. Health & Safety Code Ann. §756.022-023 (Vernon 1992), as amended, and the requirements of 29 C.F.R., Sections 1926.650 through 1926.653 inclusive, "Excavation, Trenching and Shoring," of the Occupational Safety and Health Administration Standards, as amended.
- 32.02. The Contractor must include a separate pay item for trench safety complying with trench safety requirements, stating a unit price per linear foot of trench safety systems, as measured along the centerline of trench including manholes and other line structures.
- 32.03. Before beginning work on this project, the Contractor must submit to the City a complete trench safety program that complies with state and federal regulations. It is the sole duty, responsibility and prerogative of the Contractor, not the City, to determine the specific applicability of the designed trench safety systems to each field condition encountered on the project.
- 32.04. The Contractor must provide the City the name of the "competent person" required by OSHA standards to perform the trench safety inspections. The Contractor must make daily inspections to ensure that the systems comply with all applicable laws and regulations, and must maintain a permanent record of daily inspections available for examination by the City or other government authority.
- 32.05. If evidence of possible cave-ins or slides is apparent, the Contractor must cease all work in the trench and surrounding area until the necessary precautions have been taken by the Contractor to safeguard personnel entering the trench.

33. INDEMNITY

- 33.01. **CONTRACTOR SHALL PROTECT, DEFEND, HOLD HARMLESS AND INDEMNIFY THE CITY FROM ANY AND ALL CLAIMS, DEMANDS, EXPENSES, LIABILITY OR CAUSES OF ACTION FOR INJURY TO ANY PERSON, INCLUDING DEATH, AND FOR DAMAGE TO ANY PROPERTY, TANGIBLE OR INTANGIBLE, OR FOR ANY BREACH OF CONTRACT ARISING OUT OF OR IN ANY MANNER CONNECTED WITH THE WORK DONE BY ANY PERSON UNDER THIS CONTRACT. IT IS THE INTENT OF THE PARTIES THAT THIS PROVISION SHALL EXTEND TO, AND INCLUDE, ANY AND ALL CLAIMS, CAUSES OF ACTION OR LIABILITY CAUSED BY THE CONCURRENT, JOINT AND/OR CONTRIBUTORY NEGLIGENCE OF THE CITY, AN ALLEGED BREACH OF AN EXPRESS OR IMPLIED WARRANTY BY THE CITY OR WHICH ARISES OUT OF ANY THEORY OF STRICT OR PRODUCTS LIABILITY.**
- 33.02. The indemnifications contained in paragraphs 33.01 shall include but not be limited to the following specific instances:
 - (a) In the event the City is damaged due to the act, omission, mistake, fault or default of the Contractor, then the Contractor shall indemnify and hold harmless and defend the City for such damage.
 - (b) The Contractor shall indemnify and hold harmless and defend the City from any claims for payment for goods or services brought by any material suppliers, mechanics, laborers, or other subcontractors.
 - (c) The Contractor shall indemnify and hold harmless and defend the City from any and all injuries to or claims of adjacent property owners caused by the Contractor, its agents, employees, and representatives.

- (d) The Contractor shall be responsible for any damage to the floor, walls, etc., caused by the Contractor's personnel or equipment during installation.
 - (e) The Contractor shall also be responsible for the removal of all related debris.
 - (f) The Contractor shall also be responsible for subcontractors hired by it.
 - (g) The Contractor shall indemnify, hold harmless, and defend the City from any liability caused by the Contractor's failure to comply with applicable federal, state, or local regulations, that touch upon or concern the maintenance of a safe and protected working environment and the safe use and operation of machinery and equipment in that working environment, no matter where fault or responsibility lies.
- 33.03. The indemnification obligations of the Contractor under this section shall not extend to include the liability of any professional engineer, the architect, their consultants, and agents or employees of any of them arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, Change Orders, designs or specifications, or (2) the giving of or the failure to give directions or instructions by the professional engineer, the architect, their consultants, and agents and employees of any of them, provided such giving or failure to give is the primary cause of the injury or damage.
- 33.04. It is agreed with respect to any legal limitations now or hereafter in effect and affecting the validity or enforceability of the indemnification obligation under Paragraph 33.01, such legal limitations are made a part of the indemnification obligation and shall operate to amend the indemnification obligation to the minimum extent necessary to bring the provision into conformity with the requirements of such limitations, and as so modified, the indemnification obligation shall continue in full force and effect.

34. RELEASE

The Contractor assumes full responsibility for the work to be performed hereunder, and hereby releases, relinquishes, and discharges the City, its officers, agents, and employees from all claims, demands, and causes of action of every kind and character, including the cost of defense thereof, for any injury to or death of any person (whether employees of either party or other third parties) and any loss of or damage to any property (whether property of either of the parties hereto, their employees, or of third parties) that is caused by or alleged to be caused by, arising out of, or in connection with the Contractor's work to be performed hereunder. This release shall apply regardless of whether said claims, demands, and causes of action are covered in whole or in part by insurance, and in the event of injury, death, property damage, or loss suffered by the Contractor, any subcontractor, or any person or organization directly or indirectly employed by any of them to perform or furnish work on the Project, this release shall apply regardless of whether such injury, death, loss, or damage was caused in whole or in part by the negligence of the City.

35. PERMITS AND LICENSES

The Contractor shall secure and pay for all necessary permits and licenses, governmental fees, and inspections necessary for the proper execution and completion of the work. During this Agreement term and/or period during which the Contractor is working, it shall give all notices and

comply with all laws, ordinances, rules, regulations, and lawful orders of any public authority bearing on the performance of the work.

36. ROYALTIES AND LICENSING FEES

The Contractor shall pay all royalties and licensing fees. The Contractor shall hold the City harmless and indemnify the City from the payment of any royalties, damages, losses or expenses including attorney's fees for suits, claims or otherwise, growing out of infringement or alleged infringement of patents, materials and methods used in the Project. It shall defend all suits or claims for infringement of any patent rights. Further, if the Contractor has reason to believe that the design, service, process, or product specified is an infringement of a patent, it shall promptly give such information to City's Representative.

37. BREACH OF CONTRACT & DAMAGES

37.01. The City shall have the right to declare the Contractor in breach of this Agreement for cause when the City determines that this Agreement is not being performed according to its understanding of the intent and meaning of this Agreement. Such breach shall not in any way invalidate, abrogate, or terminate the Contractor's obligations under this Agreement.

37.02. Without prejudice to any other legal or equitable right or remedy that the City would otherwise possess hereunder or as a matter of law, the City upon giving the Contractor five (5) calendar days prior written notice shall be entitled to damages for breach of contract, upon but not limited to the following occurrences:

- (a) If the Contractor shall fail to remedy any default after written notice thereof from City's Representative, as City's Representative shall direct; or
- (b) If the Contractor shall fail for any reason other than the failure by City's Representative to make payments called upon when due; or
- (c) If the Contractor commits a substantial default under any of the terms, provisions, conditions, or covenants contained in this Agreement.

38. TERMINATION FOR CAUSE

Without prejudice to any other legal or equitable right or remedy that the City would otherwise possess hereunder or as a matter of law, the City upon giving the Contractor five (5) calendar days prior written notice shall be entitled to terminate this Agreement in its entirety at any time for any of the following:

- 38.01. If the Contractor becomes insolvent, commits any act of bankruptcy, makes a general assignment for the benefit of creditors, or becomes the subject of any proceeding commenced under any statute or law for the relief of debtors and, after notice, fails to provide adequate assurance that it can remedy all of its defaults; or
- 38.02. If a receiver, trustee, or liquidator of any of the property or income of the Contractor shall be appointed; or
- 38.03. If the Contractor shall fail to prosecute the work or any part thereof with diligence necessary to insure its progress and completion as prescribed by the time schedules; or
- 38.04. If the Contractor shall fail to remedy any default within ten (10) calendar days after written notice thereof from City's Representative, as City's Representative shall direct; or
- 38.05. If the Contractor shall fail for any reason other than the failure by City's Representative to make payments called upon when due; or
- 38.06. If the Contractor abandons the Work.
- 38.07. If the Contractor commits a substantial default under any of the terms, provisions, conditions, or covenants contained in this Agreement.

39. TERMINATION FOR CONVENIENCE

- 39.01. The performance of the work may be terminated at any time in whole or, from time to time, in part, by the City for its convenience. Any such termination shall be effected by delivery to the Contractor of a written notice (notice of termination) specifying the extent to which performance of the work is terminated, and the date upon which termination becomes effective.
- 39.02. In the event of termination for convenience, the Contractor shall only be paid the reasonable value of the Work performed prior to the effective date of the termination notice and shall be further subject to any claim the City may have against the Contractor under other provisions of this Agreement or as a matter of law. In the event of termination for convenience, Contractor Waives and Releases any claim for lost profit, other than profit on Work performed prior to the effective date of such termination.

40. RIGHT TO COMPLETE

If this Agreement is terminated for cause, the City shall have the right but shall not be obligated to complete the work itself or by others; and to this end, the City shall be entitled to take possession of and use such equipment, without rental obligation therefor, and materials as may be on the job site, and to exercise all rights, options, and privileges of the Contractor under its subcontracts, purchase orders, or otherwise; and the Contractor shall promptly assign such rights, options, and privileges to City. If the City elects to complete the work itself or by others, pursuant to the foregoing, then the Contractor and/or Contractor's surety will reimburse City for all costs incurred by the City (including, without limitation, applicable, general, administrative expenses, field overhead, the cost of necessary equipment, materials, field labor, additional fees paid to architects, engineers, attorneys or others to assist the City in connection with the termination and liquidated damages) in completing and/or correcting work by the Contractor that fails to meet any requirement of this Agreement or the other Contract Documents.

41. CLOSEOUT

- 41.01. After receipt of a notice of termination, whether for cause or convenience, unless otherwise directed by City's Representative, the Contractor shall, in good faith and to the best of its ability, do all things necessary in the light of such notice to assure the efficient and proper closeout of the terminated work (including the protection of City's property). Among other things, the Contractor shall, except as otherwise directed or approved by City's Representative, do the following:
- (a) Stop the work on the date and to the extent specified in the notice of termination;
 - (b) Place no further orders or subcontracts for services, equipment, or materials, except as may be necessary for completion of such portion of the work as is not terminated;
 - (c) Terminate all orders and subcontracts to the extent that they relate to the performance of the work terminated by the notice of termination;
 - (d) Assign to City's Representative, in the manner and to the extent directed by it, all of the right, title, and interest of the Contractor under the orders or subcontracts so terminated; in which case, City's Representative shall have the right to settle or pay any or all claims arising out of the termination of such orders and subcontracts;
 - (e) With the approval of City's Representative, settle all outstanding liabilities and all claims arising out of such termination, orders, and subcontracts;
 - (f) Deliver to City's Representative, when directed by City's Representative, all documents and all property, which if the work had been completed, Contractor would have been required to account for or deliver to City's Representative, and transfer title to such property to City's Representative to the extent not already transferred; and/or

42. TERMINATION CONVERSION

Upon determination of Court of competent jurisdiction that termination of the Contractor pursuant to Paragraph 38 was wrongful and/or otherwise improper, such termination will be deemed converted to a termination for convenience pursuant to Paragraph 39 and Contractor's remedy

for such termination shall be limited to the recovery of the payments permitted for termination for convenience as set forth in Paragraph 39.

43. HIRING

During the term of this Agreement and for a period of one (1) year thereafter, the Contractor agrees not to solicit for hire any employee or employees of the City that were associated with work specified under this Agreement. In the event that this provision is breached by the Contractor, the Contractor agrees to pay the City damages in the amount equal to twelve (12) months of the employee's total compensation plus any legal expenses associated with enforcement of this provision.

44. ASSIGNMENT

This Agreement and the rights and obligations contained herein may not be assigned by the Contractor without written approval of the City.

45. EFFECTIVE DATE

The effective date of this contract shall be the date of award of the contract.

46. OTHER TERMS

46.01. **Invalidity.** If any provision of this Agreement shall be held to be invalid, illegal or unenforceable by a court or other tribunal of competent jurisdiction, the validity, legality, and enforceability of the remaining provisions shall not in any way be affected or impaired thereby. The parties shall use their best efforts to replace the respective provision or provisions of this Agreement with legal terms and conditions approximating the original intent of the parties.

46.02. **Written Notice.** Unless otherwise specified, written notice shall be deemed to have been duly served if delivered in person to the individual or to a member of the firm or to any officer of the corporation for whom it is intended or if it is delivered or sent certified mail to the last business address as listed herein. Each party will have the right to change its business address by at least thirty (30) calendar days written notice to the other parties in writing of such change.

46.03. **Entire Agreement.** It is understood that this Agreement contains the entire agreement between the parties and supersedes any and all prior agreements, arrangements, or understandings between the parties relating to the subject matter. No oral understandings, statements, promises or inducements contrary to the terms of this Agreement exist. This Agreement cannot be changed or terminated orally. No verbal agreement or conversation with any officer, agent or employee of the City, either before or after the execution of this Agreement, shall affect or modify any of the terms or obligations hereunder.

46.04. **Amendment.** No amendment to this Agreement shall be effective and binding unless and until it is reduced to writing and signed by duly authorized representatives of both parties.

46.05. **Mediation.** After receipt of a Notice of Claim, the Owner may elect to refer the matter to the Architect, Owner's Representative or another party for review. Contractor will attend meetings called to review and discuss the Claims and mitigation of the problem, and shall furnish any reasonable factual backup for the Claim requested. The Owner may also elect to defer consideration of the Claim until the Work is completed, in which case the same review options shall be available to the Owner at the completion of the Work. At any stage, the Owner, at its sole discretion, is entitled to refer a Claim to mediation under the Construction Industry Mediation Rules of the American Arbitration Association, and, if this referral is made, Contractor will take part in the mediation process. The filing,

mediation or rejection of a Claim does not entitle Contractor to stop performance of the Work. The Contractor shall proceed diligently with performance of the Contract during the pendency of any claim, excepting termination or under Owner's direction to stop the Work. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof. The parties shall share the Mediator's fee and any filing fees equally and the Mediation shall be held in South Padre Island, Texas.

- 46.06. **Arbitration.** In the event of a dispute and upon the mutual written consent of both parties, the parties may agree to arbitration without waiving any of their other rights hereunder.
- 46.07. **Choice of Law and Place of Performance.** This Agreement has been made under and shall be governed by the laws of the State of Texas. Performance and all matters related thereto shall be in Cameron County, Texas, United States of America.
- 46.08. **Authority to do business.** The Contractor represents that it has a certificate of authority, authorizing it to do business in the State of Texas, a registered agent and registered office during the duration of this contract.
- 46.09. **Authority to Contract.** Each party has the full power and authority to enter into and perform this Agreement, and the person signing this Agreement on behalf of each party has been properly authorized and empowered to enter into this Agreement. The persons executing this Agreement hereby represent that they have authorization to sign on behalf of their respective corporations.
- 46.10. **Waiver.** Failure of any party, at any time, to enforce a provision of this Agreement shall in no way constitute a waiver of that provision nor in any way affect the validity of this Agreement, any part hereof, or the right of the City thereafter to enforce each and every provision hereof. No term of this Agreement shall be deemed waived or breach excused unless the waiver shall be in writing and signed by the party claimed to have waived. Furthermore, any consent to or waiver of a breach will not constitute consent to or waiver of or excuse of any other different or subsequent breach.
- 46.11. **Headings, Gender, Number.** The article headings are used in this Agreement for convenience and reference purposes only and are not intended to define, limit, or describe the scope or intent of any provision of this Agreement and shall have no meaning or effect upon its interpretation. Words of any gender used in this Agreement shall be held and construed to include any other gender, and words in the singular number shall be held to include the plural, and vice versa, unless the context requires otherwise.
- 46.12. **Agreement Read.** The parties acknowledge that they have had opportunity to consult with counsel of their choice, have read, understand and intend to be bound by the terms and conditions of this Agreement.
- 46.13. **Multiple Originals.** It is understood and agreed that this Agreement may be executed in a number of identical counterparts, each of which shall be deemed an original for all purposes.
- 46.14. **Notice of Indemnification. City and Contractor hereby acknowledge and agree that this Agreement contains certain indemnification obligations and covenants.**
- 46.15. **Federal Compliances.** Contractor will be required to comply with the following items:
1. President's Executive Order Numbers 11246 and 11375 which prohibit discrimination in employment regarding race, creed, color, sex, or national origin.
 2. Title VI of the Civil Rights Act of 1964 which prohibits discrimination on the basis of race, color, or national origin.
 3. Davis Bacon Act, the Anti-Kickback Act, and the Contract Work Hours Standard Act regarding labor standards for federally assisted construction subagreements.
 4. Contractor must also make positive efforts to utilize small and minority owned businesses and women business enterprises.

[INSERT NAME OF CONTRACTOR]

CITY OF SOUTH PADRE ISLAND

Signature: _____

Name: _____

Title: _____

Date: _____

Signature: _____

Name: _____

Title: _____

Date: _____

EXHIBIT A: DAVIS BACON WAGE RATES

1. Payment greater than prevailing wage rate as listed within this document not prohibited per Texas Government Code, Chapter 2258, Prevailing Wage Rates, Subchapter A. General Provisions.
2. Not less than the following hourly rates shall be paid for the various classifications of work required by this project. Workers in classifications where rates are not identified shall be paid not less than the general prevailing rate of "laborer" for the various classifications of work therein listed.
3. The hourly rate for legal holiday and overtime work shall not be less than one and one-half (1 & 1/2) times the base hourly rate.
4. The rates listed are journeyman rates. Helpers may be used on the project and may be compensated at a rate determined mutually by the worker and employer, commensurate with the experience and skill of the worker but not at a rate less than 60% of the journeyman's wage as shown. Apprentices (enrolled in a federally certified apprentice program) may be used at the percentage rates of the journeyman scale stipulated in their apprenticeship agreement. At no time shall a journeyman supervise more than two (2) apprentices or helpers. All apprentices or helpers shall be under the direct supervision of a journeyman working as a crew.

"General Decision Number: TX20250003 01/03/2025

Superseded General Decision Number: TX20240003

State: Texas

Construction Types: Heavy and Highway

Counties: Cameron, Hidalgo and Webb Counties in Texas.

HEAVY & HIGHWAY CONSTRUCTION PROJECTS

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022: 	. Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least \$17.75 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2025.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022: 	. Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least \$13.30 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2025.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the

Motor Grader Operator,	
Rough.....	\$ 14.62 **
Motor Grader, Fine Grade....	\$ 16.52 **
Scraper.....	\$ 11.07 **
Servicer.....	\$ 12.34 **
Steel Worker (Reinforcing).....	\$ 14.07 **
TRUCK DRIVER	
Lowboy-Float.....	\$ 13.63 **
Single Axle.....	\$ 10.82 **
Single or Tandem Axle Dump..	\$ 14.53 **
Tandem Axle Tractor with	
Semi Trailer.....	\$ 12.12 **
WELDER.....	\$ 14.02 **

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

=====

** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 (\$17.75) or 13658 (\$13.30). Please see the Note at the top of the wage determination for more information. Please also note that the minimum wage requirements of Executive Order 14026 are not currently being enforced as to any contract or subcontract to which the states of Texas, Louisiana, or Mississippi, including their agencies, are a party.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

The body of each wage determination lists the classifications and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage determination. The classifications are listed in alphabetical order under rate identifiers indicating whether the particular rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

Union Rate Identifiers

A four-letter identifier beginning with characters other than "SU", "UAVG", ?SA?, or ?SC? denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2024 in the example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

Survey Rate Identifiers

The ""SU"" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

?SU? wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c) (1).

State Adopted Rate Identifiers

The ""SA"" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the ?SA? identifier took effect under state law in the state from which the rates were adopted.

WAGE DETERMINATION APPEALS PROCESS

- 1) Has there been an initial decision in the matter? This can be:
 - a) a survey underlying a wage determination
 - b) an existing published wage determination
 - c) an initial WHD letter setting forth a position on a wage determination matter
 - d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to davisbaconinfo@dol.gov or by mail to:

Branch of Wage Surveys
Wage and Hour Division
U.S. Department of Labor

200 Constitution Avenue, N.W.
Washington, DC 20210

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to BCWD-Office@dol.gov or by mail to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2) If an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to dba.reconsideration@dol.gov or by mail to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210.

=====

END OF GENERAL DECISION"

EXHIBIT B: INSURANCE REQUIREMENTS

During the term of this Agreement Contractor's insurance policies shall meet the following requirements:

- I. Standard Insurance Policies Required:
 - a. Commercial General Liability
 - b. Business Automobile Liability
 - c. Umbrella / Excess Liability – required for contract amounts exceeding \$1,000,000
 - d. Workers' Compensation
 - e. Builder's Risk – provides coverage for contractor's labor and materials for a project during construction that involves a structure such as a building or garage. builder's risk policy shall be written on "all risks" form.
- II. General Requirements Applicable to All Policies:
 - a. Only Insurance Carriers licensed and admitted to do business in the State of Texas will be accepted.
 - b. Deductibles shall be listed on the Certificate of Insurance and are acceptable only on a per occurrence basis for property damage only.
 - c. "Claims Made" policies are not accepted.
 - d. Each insurance policy shall be endorsed to state that coverage shall not be suspended, voided, canceled, reduced in coverage or in limits except after thirty (30) days prior written notice by certified mail, return receipt requested, has been given to the City of South Padre Island.
 - e. Upon request, certified copies of all insurance policies shall be furnished to the City of South Padre Island.
 - f. The City of South Padre Island, its officials, employees and volunteers, are to be named as "Additional Insured" to the Commercial General, Umbrella and Business Automobile Liability policies. The coverage shall contain no special limitations on the scope of protection afforded to the City, its officials, employees or volunteers.
- III. Commercial General Liability
 - a. General Liability insurance shall be written by a carrier with a "A:VIII" or better rating in accordance with the current Best Key Rating Guide.
 - b. Limit of \$1,000,000.00 per occurrence for bodily injury and property damage with an annual aggregate limit of \$2,000,000.00 which limits shall be endorsed to be per Project.
 - c. Coverage shall be at least as broad as ISO form GC 00 01.
 - d. No coverage shall be excluded from the standard policy without notification of individual exclusions being attached for review and acceptance.
 - e. The coverage shall include but not be limited to the following: premises/operations with separate aggregate; independent contracts; products/completed operations; contractual liability (insuring the indemnity provided herein) Host Liquor Liability, Personal & Advertising Liability; and Explosion, Collapse, and Underground coverage.
- IV. Business Automobile Liability
 - a. Business Automobile Liability insurance shall be written by a carrier with a "A:VIII" or better rating in accordance with the current Best Key Rating Guide.
 - b. Minimum Combined Single Limit of \$1,000,000.00 per occurrence for bodily injury and property damage.
 - c. Coverage shall be at least as broad as Insurance Service's Office Number CA 00 01.
 - d. The Business Auto Policy must show Symbol 1 in the Covered Autos Portion of the liability section in Item 2 of the declarations page.
 - e. The coverage shall include owned autos, leased or rented autos, non-owned autos, any autos and hired autos.

- f. Pollution Liability coverage shall be provided by endorsement MCS-90, with a limit of \$1,000,000.00.
- V. Excess Liability
 - a. Umbrella form excess liability coverage following the form of the underlying coverage with a minimum limit of \$5,000,000.00 or the total value of the contract, whichever is greater, per occurrence/aggregate when combined with the lowest primary liability coverage, is required for contracts exceeding \$1,000,000 in total value.
- VI. Those policies set forth in Paragraphs III, IV, and V shall contain an endorsement naming the City as Additional Insured and further providing that the Contractor's policies are primary to any self-insurance or insurance policies procured by the City. The additional insured endorsement shall be in a form at least as broad as ISO form GC 2026. Waiver of subrogation in a form at least as broad as ISO form 2404 shall be provided in favor of the City on all policies obtained by the Contractor in compliance with the terms of this Agreement. Contractor shall be responsible for all deductibles which may exist on any policies obtained in compliance with the terms of this Agreement. All coverage for subcontractors shall be subject to the requirements stated herein. All Certificates of Insurance and endorsements shall be furnished to the City's Representative at the time of execution of this Agreement, attached hereto as Exhibit D, and approved by the City before work commences.
- VII. Workers Compensation Insurance
 - a. Pursuant to the requirements set forth in Title 28, Section 110.110 of the Texas Administrative Code, all employees of the Contractor, all employees of any and all subcontractors, and all other persons providing services on the Project must be covered by a workers compensation insurance policy: either directly through their employer's policy (the Contractor's or subcontractor's policy) or through an executed coverage agreement on an approved Texas Department of Insurance Division of Workers Compensation (DWC) form. Accordingly, if a subcontractor does not have his or her own policy and a coverage agreement is used, contractors and subcontractors must use that portion of the form whereby the hiring contractor agrees to provide coverage to the employees of the subcontractor. The portion of the form that would otherwise allow them not to provide coverage for the employees of an independent contractor may not be used.
 - b. Workers compensation insurance shall include the following terms:
 - i. Employer's Liability minimum limits of \$1,000,000.00 for each accident/each disease/each employee are required.
 - ii. "Texas Waiver of Our Right to Recover From Others Endorsement, WC 42 03 04" shall be included in this policy.
 - iii. Texas must appear in Item 3A of the Workers Compensation coverage or Item 3C must contain the following: All States except those listed in Item 3A and the States of NV, ND, OH, WA, WV, and WY.
 - c. Pursuant to the explicit terms of Title 28, Section 110.110(c) (7) of the Texas Administrative Code, the bid specifications, this Agreement, and all subcontracts on this Project must include the following terms and conditions in the following language, without any additional words or changes, except those required to accommodate the specific document in which they are contained or to impose stricter standards of documentation:
 - i. *Definitions:*
 - 1. *Certificate of coverage ("certificate") – An original certificate of insurance, a certificate of authority to self-insure issued by the Division of Workers Compensation, or a coverage agreement (DWC-81, DWC-83, or DWC-84), showing statutory workers' compensation insurance coverage*

- for the person's or entity's employees providing services on a project, for the duration of the project.*
- 2. Duration of the project - includes the time from the beginning of the work on the project until the Contractor's/person's work on the project has been completed and accepted by the governmental entity.*
 - 3. Persons providing services on the project ("subcontractors" in § 406.096 [of the Texas Labor Code]) - includes all persons or entities performing all or part of the services the Contractor has undertaken to perform on the project, regardless of whether that person contracted directly with the Contractor and regardless of whether that person 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 service related to a project. "Services" does not include activities unrelated to the project, such as food/beverage vendors, office supply deliveries, and delivery of portable toilets.*
- ii. The Contractor shall provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, that meets the statutory requirements of Texas Labor Code, Section 401.011(44) for all employees of the Contractor providing services on the project, for the duration of the project.*
 - iii. The Contractor must provide a certificate of coverage to the governmental entity prior to being awarded the contract.*
 - iv. If the coverage period shown on the Contractor's current certificate of coverage ends during the duration of the project, the Contractor must, prior to the end of the coverage period, file a new certificate of coverage with the governmental entity showing that coverage has been extended.*
 - v. The Contractor shall obtain from each person providing services on a project, and provide to the governmental entity:*
 - 1. A certificate of coverage, prior to that person beginning work on the project, so the governmental entity will have on file certificates of coverage showing coverage for all persons providing services on the project; and*
 - 2. no later than seven calendar days after receipt by the Contractor, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project.*
 - vi. The Contractor shall retain all required certificates of coverage for the duration of the project and for one year thereafter.*
 - vii. The Contractor shall notify the governmental entity in writing by certified mail or personal delivery, within 10 calendar days after the Contractor knew or should have known, or any change that materially affects the provision of coverage of any person providing services on the project.*
 - viii. The Contractor shall post on each project site a notice, in the text, form and manner prescribed by the Division of Workers Compensation, informing all persons providing services on the project that they are required to be covered, and stating how a person may verify coverage and report lack of coverage.*
 - ix. The Contractor shall contractually require each person with whom it contracts to provide services on a project, to:*
 - 1. Provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, that meets the*

statutory requirements of Texas Labor Code, Section 401.011(44) for all of its employees providing services on the project, for the duration of the project;

2. *Provide to the Contractor, prior to that person beginning work on the project, a certificate of coverage showing that coverage is being provided for all employees of the person providing services on the project, for the duration of the project;*
3. *Provide the Contractor, prior to the end of the coverage period, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project;*
4. *Obtain from each other person with whom it contracts, and provide to the Contractor:*
 - a. *A certificate of coverage, prior to the other person beginning work on the project; and*
 - b. *A new certificate of coverage showing extension of coverage, prior to the end of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;*
5. *Retain all required certificates of coverage on file for the duration of the project and for one year thereafter;*
6. *Notify the governmental entity in writing by certified mail or personal delivery, within 10 calendar days after the person knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project; and*
7. *Contractually require each person with whom it contracts to perform as required by paragraphs (a) - (g), with the certificates of coverage to be provided to the person for whom they are providing services.*
- x. *By signing this contract, or providing, or causing to be provided a certificate of coverage, the Contractor is representing to the governmental entity that all employees of the Contractor who will provide services on the project will be covered by workers' compensation coverage for the duration of the project; that the coverage will be based on proper reporting of classification codes and payroll amounts; and that all 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. Providing false or misleading information may subject the Contractor to administrative penalties, criminal penalties, civil penalties, or other civil actions.*
- xi. *The Contractor's failure to comply with any of these provisions is a breach of contract by the Contractor that entitles the governmental entity to declare the contract void if the Contractor does not remedy the breach within ten calendar days after receipt of notice of breach from the governmental entity."*

VIII. Certificates of Insurance shall be prepared and executed by the insurance company or its authorized agent, and shall contain the following provisions and warranties:

- a. The company is licensed and admitted to do business in the State of Texas.
- b. The insurance policies provided by the insurance company are underwritten on forms that have been provided by the Texas State Board of Insurance or ISO.
- c. All endorsements and insurance coverages according to requirements and instructions contained herein.
- d. The form of the notice of cancellation, termination, or change in coverage provisions to the City of South Padre Island.
- e. Original endorsements affecting coverage required by this section shall be furnished with the certificates of insurance.

that such changes, if made, shall not in any way vitiate the obligation in this bond and undertaking or release the Surety therefrom.

It is further expressly agreed and understood that the Contractor and Surety will fully indemnify and hold harmless the City of South Padre Island from any liability, loss, cost, expense, or damage arising out of or in connection with the work done by the Contractor under the Contract. In the event that the City of South Padre Island shall bring any suit or other proceeding at law on the Contract or this bond or both, the Contractor and Surety agree to pay to the City the actual amounts of attorneys' fees incurred by the city in connection with such suit.

This bond and all obligations created hereunder shall be performable in Cameron County, Texas. This bond is given in compliance with the provisions of Chapter 2253 of the Texas Government Code, as amended, which is incorporated herein by this reference. However, all of the express provisions hereof shall be applicable whether or not within the scope of said statute.

Notices required or permitted hereunder shall be in writing and shall be deemed delivered when actually received or, if earlier, on the third day following deposit in a United State Postal Service post office or receptacle, with proper postage affixed (certified mail, return receipt requested), addressed to the respective other party at the address prescribed in the Contract Documents, or at such other address as the receiving party may hereafter prescribe by written notice to the sending party.

IN WITNESS THEREOF, the said Contractor and Surety have signed and sealed this instrument on the respective dates written below their signatures and have attached current Power of Attorney.

ATTEST and SEAL: (if a corporation)

(Name of Contractor)

WITNESS: (if not a corporation)

By: _____

By: _____

Name: _____

Name: _____

Title: _____

Title: _____

Date: _____

Date: _____

ATTEST/WITNESS

(SEAL)

(Full Name of Surety)

By: _____

(Address of Surety for Notice)

Name: _____

Title: _____

Date: _____

By: _____

Name: _____

Title: _____

Date: _____

REVIEWED:

THE FOREGOING BOND IS ACCEPTED ON BEHALF OF
THE CITY OF SOUTH PADRE ISLAND, TEXAS:

City Attorney's Office

City Manager

NOTE: Date of bonds must be equal to or after the date of execution by City.

TEXAS STATUTORY PAYMENT BOND

Project No. _____

THE STATE OF TEXAS §

§

KNOW ALL MEN BY THESE PRESENTS:

THE COUNTY OF CAMERON §

THAT WE, _____, as Principal, hereinafter called "Principal" and the other subscriber hereto _____, a corporation organized and existing under the laws of the State of _____, licensed to business in the State of Texas and admitted to write bonds, as Surety, herein after called "Surety", do hereby acknowledge ourselves to be held and firmly bound to the City of South Padre Island, a municipal corporation, in the sum of _____ (\$_____) for payment whereof, the said Principal and Surety bind themselves, and their heirs, administrators, executors, successors and assigns jointly and severally.

THE CONDITIONS OF THIS OBLIGATION ARE SUCH THAT:

WHEREAS, Principal has entered into a certain contract with the City of South Padre Island, dated the ____ day of _____, 200__, for _____, which contract is hereby referred to and made a 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 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 null and 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, conditions and limitations of said Code to the same extent as if it were copied at length herein.

IN WITNESS THEREOF, the said Principal and Surety have signed and sealed this instrument on the respective dates written below their signatures.

ATTEST and SEAL: (if a corporation)

(Name of Contractor)

WITNESS: (if not a corporation)

By: _____
Name:
Title:
Date:

By: _____
Name:
Title:
Date:

ATTEST/WITNESS (SEAL)

(Full Name of Surety)

By: _____
Name:
Title:
Date:

(Address of Surety for Notice)

By: _____
Name: _____
Title: _____
Date: _____

REVIEWED:

THE FOREGOING BOND IS ACCEPTED
ON BEHALF OF
THE CITY OF SOUTH PADRE ISLAND,
TEXAS:

City Attorney's Office

City Manager

NOTE: Date of bonds must be equal to or after the date of execution by City.

EXHIBIT D: CERTIFICATES OF INSURANCE AND ENDORSEMENTS

CERTIFICATES OF INSURANCE TO BE ADDED WITH SIGNED CONTRACT

EXHIBIT E: TECHNICAL SPECIFICATIONS AND PLANS

TO BE ADDED WITH SIGNED CONTRACT

EXHIBIT F: PROJECT PERMITTING

TO BE ADDED WITH SIGNED CONTRACT

EXHIBIT G: RESTORE ACT STANDARD TERMS AND CONDITIONS

EXHIBIT B: RESTORE ACT STANDARD TERMS & CONDITIONS

RESTORE ACT
FINANCIAL ASSISTANCE STANDARD TERMS
AND CONDITIONS AND PROGRAM-SPECIFIC
TERMS AND CONDITIONS

U.S. Department of the Treasury

October 1, 2024



TABLE OF CONTENTS

PREFACE	4
A Program-Specific Terms and Conditions - Awards Under the Direct Component.....	5
1. Administrative Costs	5
2. Oil Spill Liability Trust Fund	5
3. Remedies for Noncompliance	5
4. Required Use of American Iron, Steel, Manufactured Products, and Construction Materials	6
5. Buy America Preference Waivers	7
6. Buy America Preference Definitions	7
B Program-Specific Terms and Conditions - Awards Under the Centers Of Excellence Research Grants Program	8
1. Allowable Costs	8
2. Prior Approval for Changes in Centers of Excellence	8
3. Performance Reports.....	8
STANDARD TERMS AND CONDITIONS	10
C Applicable Laws, Regulations, and Program Requirements.....	10
D Use Of Funds and Financial Requirements	10
1. Scope of Work	10
2. Pre-Award Costs	10
3. Indirect Costs.....	11
4. Cost Sharing and Budget Limitations.....	11
5. Program Income	11
6. Incurring Costs or Obligating Federal Funds Beyond the Expiration Date.....	12
7. Tax Refunds	12
8. Requirement to Maintain a Conflict-of-Interest Policy	12
9. Prohibition on Use of Funds for Certain Telecommunications and Video Surveillance Services or Equipment.....	12
10. Limitation on Use of Funds for Research Involving Human Subjects	13
11. Limitation on Use of Funds for Foreign Travel	14
12. Subawards	15
E Effect of a Government Shutdown on Disbursements and the Availability of Treasury Personnel.....	16
F Recipient Reporting and Audit Requirements.....	16
1. Financial Reports	16
2. Performance Reports.....	17
3. Performance Measures	18
4. Interim Reporting on Significant Developments per 2 C.F.R. § 200.329(e).....	19

5.	Audit Requirements	19
6.	Operational Self-Assessment.....	19
7.	Reporting Requirements under the Federal Funding Accountability and Transparency Act (FFATA) of 2006, Pub. L. No. 109-282, as amended by the Digital Accountability and Transparency Act (DATA Act) of 2014, Pub. L. No. 113-101	20
8.	System for Award Management (SAM.gov) and Universal Identifier Requirements	20
9.	Reporting Requirements for Status of Real Property or Interest in Real Property	20
10.	Reporting on Lobbying	20
G	Financial Management System and Internal Control Requirements	22
H	Records Retention Requirements	23
I	The Federal Government’s Right To Inspect, Audit, and Investigate	24
1.	Access to Records.....	24
2.	Access to the Recipients, Subrecipient’s, and Contractor’s Sites	24
J	Award Disbursement	24
K	Notifications and Prior Approvals	26
1.	Notifications.....	26
2.	Prior Approvals	26
L	Amendments And Closeout	27
1.	Amendments	27
2.	Closeout	28
M	Termination And Remedies for Noncompliance	29
N	Debts	31
1.	Payment of Debts Owed the Federal Government.....	31
2.	Effect of Judgment Lien on Eligibility for Federal Grants, Loans, or Programs.....	31
O	Non-Discrimination Requirements	31
1.	Statutory Provisions	32
2.	Regulatory Provisions.....	32
3.	Executive Orders	32
4.	Title VII Exemption for Religious Organizations	33
5.	Protections for Whistleblowers.....	33
P	Requirement to Check Debarment and Suspension Status ff Subrecipients, Contractors, Subcontractors, and Vendors.....	33
Q	Procurement	34
1.	General Provisions	34
2.	Solid Waste Disposal	34
3.	Subawards	34
4.	Small Businesses, Minority, Women, and Veteran-Owned Business Enterprises	34
5.	Domestic Preference for Procurement	35

R	Environmental Requirements	35
S	Real Property, Construction, Equipment, and Supplies	36
1.	General Requirements	36
2.	Real Property and Acquisition of Land and Land Interests	36
3.	Compliance with State, Local and Federal Requirements	36
4.	Title	37
5.	Permitting Requirements	38
6.	Estimated Useful Life	38
7.	Recording the Federal Interest in the Real Property	38
8.	Use of Real Property	39
9.	Administration, Operation, and Maintenance	40
10.	Commencement of Construction	40
11.	Insurance	41
12.	Bonding	41
13.	Floodplain Requirements	41
14.	Goals for Women and Minorities in Construction	42
15.	Davis Bacon Act, as amended (40 U.S.C. §§ 3141–3148)	42
16.	Equal Opportunity Clause	44
17.	Revised Americans with Disabilities Act (ADA) Standards for Accessible Design for Construction Awards	45
18.	Supplies and Equipment	45
T	Miscellaneous Requirements And Provisions	46
1.	Prohibition Against Assignment by the Recipient	46
2.	Disclaimer Provisions	46
3.	Prohibited and Criminal Activities	46
4.	Limitations on Political Activities of Employees	46
5.	Drug-Free Workplace	47
6.	Increasing Seat Belt Use in the United States	47
7.	Reducing Text Messaging While Driving	47
8.	Minority Serving Institutions (MSIs) Initiative	47
9.	Research Misconduct	47
10.	Care and Use of Live Vertebrate Animals	48
11.	The Trafficking Victims Protection Act of 2000, as amended, (22 U.S.C. § 7104(g)), and the implementing regulations at 2 C.F.R. Part 175	48
12.	Publications and Signage	50
13.	Copyright	50
14.	Homeland Security Presidential Directive 12	50
15.	Export Control	51

Appendix I: 2 C.F.R. Part 170, Appendix A 53

Appendix li: 2 C.F.R. Part 25, Appendix A 56

Appendix lii: Davis-Bacon And Related Acts Requirements..... 57

**Appendix Iv: Contract Clauses Required for Contracts Subject to the Requirements of the Contract
Work Hours and Safety Standards Act..... 62**

Appendix V: 41 C.F.R. § 60-1.4..... 63

RESTORE ACT FINANCIAL ASSISTANCE STANDARD TERMS AND CONDITIONS AND PROGRAM-SPECIFIC TERMS AND CONDITIONS

PREFACE

A grant agreement is comprised of the following documents:

1. A Notice of Award from the Department of the Treasury (“Treasury”);
2. The RESTORE Act Financial Assistance Standard Terms and Conditions (“Standard Terms and Conditions”);
3. The RESTORE Act Financial Assistance Program-Specific Terms and Conditions (“Program-Specific Terms and Conditions”);
4. An approved application, including all documents, certifications, and assurances that are part of the approved application;
5. An approved scope of work;
6. Any approved budget; and,
7. Any special terms and conditions applied by Treasury to the award (“Special Award Conditions”).

The recipient must comply with—and require each of its subrecipients, contractors, and subcontractors employed in the completion of the activity, project, or program to comply with—the RESTORE Act, Treasury’s implementing regulations at 31 C.F.R. Part 34, all applicable federal statutes, regulations, executive orders (EOs), Office of Management and Budget (OMB) circulars, any program guidance issued by Treasury (including the RESTORE Act Frequently Asked Questions relating to the Direct Component Program), Standard Terms and Conditions, Program-Specific Terms and Conditions, and any Special Award Conditions of this federal financial assistance award (“Award”), as applicable, in addition to the certifications and assurances required at the time of application.

Any inconsistency or conflict in the Standard Terms and Conditions, Program-Specific Terms and Conditions, and any Special Award Conditions of this Award will be resolved according to the following order of precedence: federal laws, Executive Orders, federal regulations, applicable notices published in the Federal Register, OMB circulars, Treasury’s Standard Terms and Conditions, Program-Specific Terms and Conditions, and any Special Award Conditions.

Some of these Standard Terms and Conditions contain, by reference or substance, a summary of pertinent federal statutes, federal regulations published in the Federal Register (Fed. Reg.) or Code of Federal Regulations (C.F.R.), EOs, or OMB circulars. In particular, these Standard Terms and Conditions incorporate many of the provisions contained in OMB’s Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards (“Uniform Guidance,” 2 C.F.R. Part 200), which supersedes former OMB Circular A-102 (the former grants management common rule), OMB Circular A-133 (single audit requirements), and all former OMB circulars containing the cost principles for grants and cooperative agreements. To the extent that it is a summary, such a provision is not in derogation of, or an amendment to, any such statute, regulation, EO, or OMB circular. Unless a definition is provided here, definitions can be found in the RESTORE Act (Public Law No. 112-141 (July 6, 2012), Treasury’s implementing regulations (79 Fed. Reg. 48039 (Aug. 15, 2014) and 79 Fed. Reg. 61236 (Oct. 10, 2014), as codified at 31 C.F.R. Part 34), or 2 C.F.R. Part 200.

A PROGRAM-SPECIFIC TERMS AND CONDITIONS - AWARDS UNDER THE DIRECT COMPONENT

In addition to all the Standard Terms and Conditions described in Sections C through T of this document, all Treasury RESTORE Act awards made under the Direct Component include the following Program-Specific Terms and Conditions:

1. Administrative Costs

- a. Administrative costs are defined as indirect costs for administration incurred by the recipient that are allocable to activities authorized under the RESTORE Act, as specified in 31 C.F.R. § 34.2. Administrative costs do not include:
 - i. Direct costs that directly support the scope of work and are identified as direct costs in the approved award budget;
 - ii. Indirect costs that are identified specifically with, or readily assignable to facilities, as defined in 2 C.F.R. § 200.414; and,
 - iii. Indirect costs of subrecipients.
- b. Of the amounts received from Treasury under the Direct Component, not more than three percent may be used for administrative costs. See 31 C.F.R. § 34.204(a)(1). The three percent limit on administrative costs may be applied to the total amount of funds received by a recipient either on a grant-by-grant basis or on an aggregate basis. For the latter method, amounts used for administrative costs may not at any time exceed three percent of the aggregate of:
 - i. The amounts received under a component (i.e., Direct Component) by a recipient, beginning with the first grant through the most recent grant; and,
 - ii. The amounts in the Trust Fund that are allocated to, but not yet received by the recipient under 31 C.F.R. § 34.103, consistent with the definition of administrative costs in 31 C.F.R. § 34.2.
- c. Up to 100 percent of program income, as defined in 2 C.F.R. § 200.1 and elaborated in 2 C.F.R. § 200.307, may be used to pay for allowable administrative costs, subject to the three percent cap. Program income may also be used to defray other allowable costs under the award.

2. Oil Spill Liability Trust Fund

The recipient must not seek any compensation for the approved program or project from the Oil Spill Liability Trust Fund. If the recipient is authorized to make subawards, the recipient must not use Direct Component funds to make subawards to fund activities for which any claim for compensation was filed and paid out by the Oil Spill Liability Trust Fund after July 6, 2012.

3. Remedies for Noncompliance

- a. If Treasury determines that the recipient has expended Direct Component funds to cover the cost of any ineligible activities, in addition to the remedies available in Section M of these Standard Terms and Conditions, per 31 C.F.R. § 34.804, Treasury will make no additional payments to the recipient from the Gulf Coast Restoration Trust Fund (Trust Fund), including no payments from the Trust Fund for

activities, projects, or programs until the recipient has either (1) deposited an amount equal to the amount expended for the ineligible activities in the Trust Fund, or (2) Treasury has authorized the recipient to expend an equal amount from the recipient's own funds for an activity that meets the requirements of the RESTORE Act.

- b. If Treasury determines the recipient has materially violated the terms of this Award, Treasury will make no additional funds available to the recipient from any part of the Trust Fund until the recipient corrects the violation.

4. **Required Use of American Iron, Steel, Manufactured Products, and Construction Materials**

- a. Pursuant to section 70914 of the Build America, Buy America Act, included in the Infrastructure Investment and Jobs Act (IIJA), Pub. L. 117-58 (November 15, 2021), none of the funds provided under this award may be used for a project for infrastructure, as defined in paragraph (b) below unless:
 - i. All iron and steel used in the project are produced in the United States, which means that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States;
 - ii. All manufactured products used in the project are produced in the United States, which means that the manufactured product was manufactured in the United States; and the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product, unless another standard for determining the minimum amount of domestic content of the manufactured product has been established under applicable law or regulation; and,
 - iii. All construction materials are manufactured in the United States, which means that all manufacturing processes for the construction material occurred in the United States.
- b. For the purposes of this section, the term “infrastructure” means public infrastructure, including but not limited to the structures, facilities, and equipment for, in the United States, roads, highways, and bridges; public transportation; dams, ports, harbors, and other maritime facilities; intercity passenger and freight railroads; freight and intermodal facilities; airports; water systems, including drinking water and wastewater systems; electrical transmission facilities and systems; utilities; broadband infrastructure; and buildings and real property. Infrastructure includes facilities that generate, transport, and distribute energy.
- c. The requirement of paragraph (a) (the “Buy America preference”) only applies to articles, materials, and supplies that are consumed in, incorporated into, or affixed to an infrastructure project. As such, it does not apply to tools, equipment, and supplies, such as temporary scaffolding, brought to the construction site and removed at or before the completion of the infrastructure project. Nor does the Buy America preference apply to equipment and furnishings, such as movable chairs, desks, and portable computer equipment, that are used at or within the finished infrastructure project but are not an integral part of the structure or permanently affixed to the infrastructure project. See OMB Memorandum M-24-02.

5. **Buy America Preference Waivers**

- a. The Buy America Preference shall not apply if a waiver covering the project is in effect at the time that Treasury obligates the award funds for the new award or amendment to the existing award (provided as the “Date Issued” in the Notice of Award). All waivers will be posted on Treasury’s RESTORE Act, Buy America website at <https://home.treasury.gov/policy-issues/financial-markets-financial-institutions-and-fiscal-service/restore-act/restore-act-buy-america-preference>.
- b. Recipients may also apply for, and Treasury may grant, a waiver from these requirements on a project or product level. Treasury will provide information on the process for requesting a waiver from these requirements. For more information on the waiver request process see <https://home.treasury.gov/policy-issues/financial-markets-financial-institutions-and-fiscal-service/restore-act/restore-act-buy-america-preference>.
- c. In accordance with 2 C.F.R. § 184.7, Treasury may waive the application of the Buy America preference in any case in which Treasury determines that:
 - i. Applying the Buy America Preference would be inconsistent with the public interest;
 - ii. The types of iron, steel, manufactured products, or construction materials are not produced in the United States in sufficient and reasonably available quantities or of a satisfactory quality; or,
 - iii. The inclusion of iron, steel, manufactured products, or construction materials produced in the United States will increase the cost of the overall project by more than 25 percent.
- d. A request to waive the application of the Buy America preference must be submitted in writing. Treasury will provide instructions on the format, contents, and supporting materials required for any waiver request. Waiver requests are subject to public comment periods of no less than 15 days and must be reviewed by the Made in America Office within the Office of Management and Budget.

6. **Buy America Preference Definitions**

Definitions of terms related to the Buy America Preference requirement provided in this section are provided on Treasury’s RESTORE Act, Buy America website at <https://home.treasury.gov/policy-issues/financial-markets-financial-institutions-and-fiscal-service/restore-act/restore-act-buy-america-preference>.

B PROGRAM-SPECIFIC TERMS AND CONDITIONS - AWARDS UNDER THE CENTERS OF EXCELLENCE RESEARCH GRANTS PROGRAM

In addition to all the Standard Terms and Conditions described in Sections C through T of this document, all Treasury RESTORE Act awards under the Centers of Excellence Research Grants Program include the following Program-Specific Terms and Conditions:

1. **Allowable Costs**

In addition to the prohibitions contained in 2 C.F.R. Part 200, Subpart E (*Cost Principles*), the following costs are unallowable unless approved in writing by Treasury:

- a. Construction, including the alteration, repair, or rehabilitation of existing structures;
- b. Facilities costs that are allowable as indirect costs in a federally approved negotiated indirect cost rate; and,
- c. Acquisition of land or interests in land.

2. **Prior Approval for Changes in Centers of Excellence**

- a. The recipient must immediately notify Treasury if it anticipates selecting a new entity or consortium to serve as a Center of Excellence or making other changes to the initial selection of Center(s) of Excellence described in the scope of work.
- b. After the recipient notifies Treasury pursuant to (a) and finalizes the selection, the recipient must promptly inform Treasury of the following:
 - i. Name of the Center of Excellence and the entity selected to administer it, including the names of member organizations if the entity is a consortium;
 - ii. Unique Entity Identifier (UEI) Number;
 - iii. Location of the entity;
 - iv. The discipline or disciplines, as set forth in Section 1605(d) of the RESTORE Act and Treasury's implementing regulations at 31 C.F.R. § 34.704(b), that will serve as a focus of research for the selected Center or Centers of Excellence;
 - v. Documentation of the competitive process used to select the Center or Centers of Excellence, including all documentation to demonstrate the recipient complied with the selection requirements set forth in Section 1605 of the RESTORE Act and Treasury's implementing regulations at 31 C.F.R. § 34.704(b); and,
 - vi. The estimated budget for the Center, including the total allocation of funded dollars for the Center.

3. **Performance Reports**

In addition to the reporting requirements in Section F, pursuant to 31 C.F.R. § 34.706, the recipient must submit an annual report to the Gulf Coast Ecosystem Restoration Council ("Council"), in a form prescribed by the Council that includes information on subrecipients, subaward amounts, disciplines addressed, and any other information required by the Council. When the subrecipient is a consortium, the annual report must also identify the

consortium members. This information will be included in the Council's annual report to Congress. The recipient must provide a copy of this report to Treasury when it submits the report to the Council.

STANDARD TERMS AND CONDITIONS
AWARDS UNDER THE DIRECT COMPONENT AND THE CENTERS OF EXCELLENCE RESEARCH
GRANTS PROGRAM

C APPLICABLE LAWS, REGULATIONS, AND PROGRAM REQUIREMENTS

This Award is subject to the following federal laws, regulations, and requirements. This list is not exclusive:

1. The RESTORE Act, Pub. L. No. 112-141 (July 6, 2012);
2. Treasury's implementing regulations, 31 C.F.R. Part 34;
3. Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards, 2 C.F.R. Part 200, Subparts A through F, and any Treasury regulations incorporating these requirements;
4. OMB Guidelines to Agencies on Governmentwide Debarment and Suspension (Nonprocurement), 2 C.F.R. Part 180 including the requirement to include a term or condition in all lower-tier covered transactions (contracts and subcontracts described in 2 C.F.R. Part 180, subpart B) that the award is subject to 2 C.F.R. Part 180 and Treasury's implementing regulations at 31 C.F.R. Part 19;
5. Governmentwide Requirements for Drug-Free Workplace (Financial Assistance), 31 C.F.R. Part 20;
6. New Restrictions on Lobbying, 31 C.F.R. Part 21;
7. Reporting Subaward and Executive Compensation Information, 2 C.F.R. Part 170;
8. Universal Identifier and System for Award Management (SAM), 2 C.F.R. Part 25;
9. Recipient Integrity and Performance Matters, Appendix XII to 2 C.F.R. Part 200;
10. Award Term related to Trafficking in Persons, 2 C.F.R. Part 175;
11. Treasury's RESTORE Act Frequently Asked Questions (FAQs) related to the Direct Component program and other program guidance; and,
12. Any special award conditions included in the award.

D USE OF FUNDS AND FINANCIAL REQUIREMENTS

1. **Scope of Work**

The recipient must only use funds obligated and disbursed under this Award for the purpose of carrying out activities described in the attached approved scope of work. The recipient must not incur or pay any expenses under this Award for activities not related to the attached approved scope of work unless Treasury first approves an Award amendment explicitly modifying the approved scope of work to include those activities.

2. **Pre-Award Costs**

The recipient may obligate funds under this Award only during the period of performance specified in the Notice of Award, which is the time period during which the recipient may incur new obligations and costs to carry out the work authorized under this Award. The only exception is for costs related to award reporting and closeout after the end of the period of performance, or costs incurred prior to the effective date of this Award, which are allowable only if:

- a. Treasury specifically authorized these costs in writing on or after the issuance date of this Award;
- b. Incurring these costs was necessary for the efficient and timely performance of the scope of work; and,
- c. These costs would have been allowable if incurred after the date of the award.

3. **Indirect Costs**

- a. The recipient may only charge indirect costs to this Award if these costs are allowable under 2 C.F.R. Part 200, Subpart E (*Cost Principles*). For Direct Component awards, there is a three percent limit on indirect costs per 31 C.F.R. § 34.204(a)(1). Please see the RESTORE Act Frequently Asked Questions (FAQs) related to the Direct Component Program for more information on the limitations on indirect costs (administrative costs) at <https://home.treasury.gov/policy-issues/financial-markets-financial-institutions-and-fiscal-service/restore-act/direct-component/direct-component-resources>. Indirect costs charged to the award must be consistent with an accepted de minimis rate or the indirect cost rate agreement negotiated between the recipient and its cognizant agency (defined as the federal agency that is responsible for reviewing, negotiating, and approving cost allocation plans or indirect cost proposals, see 2 C.F.R. § 200.1) and must be included in the recipient's budget.
- b. Unallowable direct costs are not recoverable as indirect costs.
- c. The maximum dollar amount of allocable indirect costs charged to this Award shall be the lesser of:
 - i. The line item amount for the indirect costs contained in the approved budget, including all budget revisions approved in writing by the Treasury; or,
 - ii. The total indirect costs allocable to this Award based on the indirect cost rate approved by a cognizant or oversight federal agency and applicable to the period in which the cost was incurred, provided that the rate is approved on or before the Award end date.

4. **Cost Sharing and Budget Limitations**

- a. There is no requirement for cost sharing for grants under the Direct Component and the Centers of Excellence Research Grants programs. However, if cost share funds are included in the approved award budget, the recipient must obtain and use these cost share funds for the purposes of the award.
- b. The recipient shall not request or receive additional funding beyond what was included in the approved application for the attached approved scope of work from any federal or non-federal source without first notifying Treasury.

5. **Program Income**

Program Income is defined in 2 C.F.R. § 200.1 as gross income earned by the recipient or subrecipient that is directly generated by a supported activity or earned as a result of the federal award during the period of performance except as provided by 2 C.F.R. § 200.307(c). As permitted by 2 C.F.R. § 307(d), Treasury authorizes costs incidental to the generation of program income that have not been charged to the award to be deducted from the gross income to determine program income for this award (i.e., net program income). Any program income generated by the recipient or the subrecipient during the period of performance of the award or period of performance of the subrecipient's subaward, as applicable, must be included in the approved budget and be used for the purposes of the Award and under the

conditions of these Standard Terms and Conditions and any Special Award Conditions, i.e., solely to accomplish the approved scope of work. All program income determinations are project scope-specific and should be determined prior to award or at the earliest point possible post-award.

6. **Incurring Costs or Obligating Federal Funds Beyond the Expiration Date**

The recipient must not incur costs or obligate funds under this Award for any purpose pertaining to the operation of the activity, project, or program beyond the end of the period of performance. The only costs that are authorized for a period up to 120 days following the end of the period of performance are those strictly associated with closeout activities. Closeout activities are normally limited to the preparation of final progress, financial, and required audit reports unless otherwise approved in writing by Treasury. Under extraordinary circumstances, and at Treasury's sole discretion, Treasury may approve the recipient's request for an extension of the 120-day closeout period.

7. **Tax Refunds**

Refunds of taxes paid under the Federal Insurance Contributions Act (FICA) and the Federal Unemployment Tax Act (FUTA) that are received by the recipient during or after the period of performance must be refunded or credited to Treasury if these taxes were paid out of RESTORE Act funds in accordance with 2 C.F.R. Part 200, Subpart E (*Cost Principles*). The recipient agrees to contact Treasury immediately upon receipt of these refunds.

8. **Requirement to Maintain a Conflict-of-Interest Policy**

Recipient understands and agrees it must maintain a conflict-of-interest policy consistent with 2 C.F.R. § 200.318(c), and that such conflict-of-interest policy is applicable to each activity funded under this award. Recipients and subrecipients must disclose in writing to Treasury or the pass-through agency, as appropriate, any potential conflict of interest affecting the awarded funds in accordance with 2 C.F.R. § 200.112.

9. **Prohibition on Use of Funds for Certain Telecommunications and Video Surveillance Services or Equipment**

- a. Recipients must comply with 2 C.F.R. § 200.216 with respect to obligations and expenditures of Treasury's RESTORE Act grants funded on or after 8/13/2020. As required by 2 C.F.R. § 200.216, Treasury's RESTORE Act recipients and subrecipients are prohibited from obligating or expending grant funds to procure or obtain covered telecommunications equipment or services; extend or renew a contract to procure or obtain covered telecommunications equipment or services; or enter into a contract (or extend or renew a contract) to procure or obtain covered telecommunications equipment or services.
- b. As described in Public Law 115–232, section 889, covered telecommunications equipment or services are defined as follows:
 - i. Telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities);
 - ii. For the purpose of public safety, security of government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities);
 - iii. Telecommunications or video surveillance services provided by such entities or using such equipment; or,

- iv. Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of the National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of the People's Republic of China.
- c. For the purposes of this section, "covered telecommunications equipment or services" also include systems that use covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system.
- d. Whenever procuring, contracting for, or obtaining telecommunications or video surveillance services or equipment, the recipient must make a good-faith effort to ascertain that none of the equipment or services are from a prohibited source. The recipient must review the list of excluded parties in the System for Award Management (SAM) (<https://www.sam.gov>) for entities excluded from receiving federal awards for "covered telecommunications equipment or services."
- e. The recipient must ensure that the prohibition on covered telecommunications and video surveillance services and equipment flows down to all lower-tier transactions, to include all subawards and contracts.
- f. When the recipient or subrecipient accepts a RESTORE Act grant, it is certifying that it will comply with the prohibition on covered telecommunications equipment and services in this section. The recipient or subrecipient is not required to certify that funds will not be expended on covered telecommunications equipment or services beyond the certification provided upon accepting the grant and those provided upon submitting payment requests and financial reports.
- g. For additional information, see section 889 of Public Law 115-232 and 2 C.F.R. § 200.471.

10. **Limitation on Use of Funds for Research Involving Human Subjects**

- a. No work involving human subjects may be undertaken, conducted, or costs incurred and/or charged to this Award for human subject's research, until the appropriate documentation is approved in writing by Treasury.
- b. The Federal policy for the protection of human subjects (the "Common Rule") as codified in 45 C.F.R. Part 46, Subpart A, defines a human subject as a living individual about whom an investigator conducting research obtains (1) information or biospecimens through intervention or interaction with the individual (e.g., surveys and focus groups), and uses, studies, or analyzes the information or biospecimens or (2) uses, studies, analyzes, or generates identifiable private information or identifiable biospecimens. Research means a systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge.
- c. The recipient and subrecipient, as appropriate, must maintain appropriate policies and procedures for the protection of human subjects. In the event it becomes evident that human subjects may be involved in this project, the recipient must submit appropriate documentation to Treasury for approval by the appropriate Treasury officials. This documentation may include:
 - i. Documentation establishing approval of the project by an institutional review board (IRB) approved for federal-wide use under Department of Health and Human Services guidelines;

- ii. Documentation to support an exemption for the project;
- iii. Documentation to support deferral for an exemption or IRB review; or,
- iv. Documentation of IRB approval of any modification to a prior approved protocol or to an informed consent form.

11. **Limitation on Use of Funds for Foreign Travel**

- a. The recipient and subrecipient may not use funds from this Award for travel outside of the United States unless Treasury provides prior written approval.
- b. The recipient and subrecipient must comply with the provisions of the Fly America Act, as amended, (49 U.S.C. § 40118). The implementing regulations of the Fly America Act are found at 41 C.F.R. § 301-10.131 through 301-10.143.
- c. The Fly America Act requires that federal travelers and others performing U.S. Government-financed air travel must use U.S. flag air carriers, to the extent that service by such carriers is available. Foreign air carriers may be used only in specific instances, such as when a U.S. flag air carrier is unavailable, or use of U.S. flag air carrier service will not accomplish the agency's mission.
- d. One exception to the requirement to fly U.S. flag carriers is transportation provided under a bilateral or multilateral air transport agreement, to which the United States Government and the government of a foreign country are parties, and which the Department of Transportation has determined meets the requirements of the Fly America Act pursuant to 49 U.S.C. § 40118(b). The United States Government has entered into bilateral/multilateral "Open Skies Agreements" (U.S. Government Procured Transportation) that allow federal funded transportation services for travel and cargo movements to use foreign air carriers under certain circumstances. There are multiple "Open Skies Agreements" currently in effect. For more information about the current bilateral and multilateral agreements, visit the GSA website <http://www.gsa.gov/portal/content/103191>. Information on the Open Skies agreements (U.S. Government Procured Transportation) and other specific country agreements may be accessed via the Department of State's website <http://www.state.gov/e/eeb/tra/>.
- e. If a foreign air carrier is anticipated to be used for any portion of travel funded under this Award, the recipient must receive prior approval from Treasury. When requesting such approval, the recipient must provide a justification in accordance with guidance provided by 41 C.F.R. § 301-10.142, which requires the recipient to provide Treasury with the following: name; dates of travel; origin and destination of travel; detailed itinerary of travel; name of the air carrier and flight number for each leg of the trip; and a statement explaining why the recipient meets one of the exceptions to the regulations. If the use of a foreign air carrier is pursuant to a bilateral agreement, the recipient must provide Treasury with a copy of the agreement or a citation to the official agreement available on the GSA website. Treasury shall make the final determination and notify the recipient in writing. Failure to adhere to the provisions of the Fly America Act will result in the recipient not being reimbursed for any transportation costs for which the recipient improperly used a foreign air carrier.

12. **Subawards**

- a. Recipients that enter into subawards under this award must execute a legally binding written agreement with the subrecipient which includes a budget by federal object class categories or fixed amount (2 C.F.R. § 200.332). This agreement must incorporate all the terms and conditions of this Award, including any applicable Special Award Conditions, and must include the information at 2 C.F.R. § 200.332(b). The recipient must perform all responsibilities required of a pass-through entity, as specified in 2 C.F.R. § 200.332, including but not limited to monitoring use of RESTORE Act grant funds and compliance with all terms and conditions; following up on any deficiencies identified as a result of onsite or desk reviews and/or audits; and reviewing and correcting as necessary all subrecipient performance and financial reporting before including this information on the recipients' required RESTORE Act grant program's Performance Progress Reports (PPR) and Federal Financial Report (SF-425) reports.
- b. Recipients must verify that a proposed subrecipient is not excluded or disqualified from receiving or participating in Federal awards prior to making a subaward to the proposed subrecipient. Recipients may use the verification methods provided at 2 C.F.R. § 180.300 and Treasury's implementing regulations at 31 C.F.R. § 19.300, which include confirming in SAM.gov that a potential subrecipient is not suspended, debarred, or otherwise excluded from receiving Federal funds.
- c. The recipient must evaluate and document each subrecipient's risk of noncompliance with federal statutes, regulations, and the terms and conditions of the subaward for purposes of determining the appropriate subrecipient monitoring strategy, as described in 2 C.F.R. § 200.332(c).
- d. The recipient must monitor the subrecipient's use of federal funds through reporting, site visits, regular contact, or other means to provide reasonable assurance that the subrecipient is administering the subaward in compliance with the RESTORE Act, Treasury's implementing regulations, these Standard Terms and Conditions, Program-Specific Terms and Conditions, and any applicable Special Award Conditions, and to ensure that the scope of work is being appropriately carried out and milestones are achieved.
- e. The recipient must provide training and technical guidance to the subrecipient as necessary.
- f. The recipient must, if necessary, take appropriate enforcement actions against noncompliant subrecipients.
- g. If lower-tier subawards are authorized by Treasury, the recipient must ensure that a subrecipient who makes a subaward applies the terms and conditions of this Award, including any Special Award Conditions, to all lower-tier subawards through a legally binding written agreement, and that a subrecipient who makes a subaward carries out all the responsibilities of a pass-through entity described at 2 C.F.R. § 200.332.
- h. The recipient must verify that no subrecipient appears on the excluded party list on sam.gov. If lower-tier subawards are authorized by Treasury, the recipient must ensure that a subrecipient who makes a subaward verifies that this lower-tier subrecipient does not appear on the excluded parties list in sam.gov prior to issuing the subaward.
- i. The recipient or subrecipient must maintain written standards of

conduct covering conflicts of interest and governing the actions of its employees engaged in the selection, award, and administration of contracts consistent with 2 C.F.R. § 200.318(c)(1).

- j. No employee, officer, agent, or board member with real or apparent conflict of interest may participate in the selection, award, or administration of a contract supported by the Federal award. A conflict of interest includes when the employee, officer, agent, or board member, any member of their immediate family, their partner, or an organization that employs or is about to employ any of the parties indicated mentioned in this section, has a financial or other interest in or a tangible personal benefit from an entity considered for a contract.
- ii. An employee, officer, agent, and board member of the recipient or subrecipient may neither solicit nor accept gratuities, favors, or anything of monetary value from contractors.
- iii. A recipient or subrecipient may set standards for situations where the financial interest is not substantial, or a gift is an unsolicited item of nominal value. The recipient's or subrecipient's standards of conduct must also provide for disciplinary actions to be applied for violations by its employees, officers, agents, or board members. A financial interest may include employment, stock ownership, a creditor or debtor relationship, or prospective employment with the organization selected or to be selected for a contract.
- iv. The standards of conduct must provide for disciplinary actions to be applied for violations of such standards by officers, employees, or agents of the recipient or subrecipient.

E EFFECT OF A GOVERNMENT SHUTDOWN ON DISBURSEMENTS AND THE AVAILABILITY OF TREASURY PERSONNEL

In the event of a federal government shutdown, Treasury will issue guidance to the recipient concerning the expected effects on this Award.

F RECIPIENT REPORTING AND AUDIT REQUIREMENTS

1. Financial Reports

- a. The recipient must submit a "Federal Financial Report" (SF-425) on a semi-annual basis for the periods ending March 31 and September 30, or any portion thereof, unless otherwise specified in a Special Award Condition. Reports are due no later than 30 days following the end of each reporting period. A final SF-425 must be submitted within 120 days after the end of the period of performance.
- b. In the remarks section of each SF-425 submitted, the recipient must describe by federal budget cost category (e.g., Personnel: Provide Dollar Amount Expended; Fringe: Provide Dollar Amount Expended; Equipment: Provide Dollar Amount Expended; Construction: Provide Dollar Amount Expended, etc.) the use of all funds received by the recipient and subrecipient (if applicable).
- c. There is no requirement for cost sharing for grants under Treasury's RESTORE Act grant programs. However, if cost share funds are included in the approved award budget, the SF-425 must reflect the cumulative status of federal and non-federal funds to capture the financial status of the grant award as of the end of the reporting period. The cost share must be reported in the Recipient Share

section of the SF-425.

- d. The report must be signed by an authorized certifying official who is the employee authorized by the recipient organization to submit financial data on its behalf.
- e. The recipient must submit all financial reports via the RESTORE Grants Management System (<https://portal.treasury.gov/RGMS>) unless otherwise specified by Treasury in writing.

2. **Performance Reports**

- a. The recipient must submit an SF-PPR ("Performance Progress Report"), a "RESTORE Act Status of Performance Report," (standard format provided by Treasury, OMB Approval No. 1505-0250) and an updated "RESTORE Act Milestones Report," (standard format provided by Treasury, OMB Approval No. 1505-0250) on a semi-annual basis for the periods ending March 31 and September 30, or any portion thereof, unless otherwise specified in a Special Award Condition. Reports are due no later than 30 days following the end of each reporting period, except the final report, which is due 120 days following the end of the period of performance.
- b. The recipient must submit all performance reports in (a) above, via the RESTORE Grants Management System (<https://portal.treasury.gov/RGMS>), unless otherwise specified in writing by Treasury, and the recipient must complete these reports according to the following instructions:
 - i. SF-PPR: In the "performance narrative" attachment (section B of the SF-PPR), the recipient must provide the following information:
 - a) In Section B-1:
 - 1) Summarize activities undertaken during the reporting period by the recipient and any subrecipients (if applicable);
 - 2) Summarize cumulative activities undertaken since the award period of performance start date by the recipient and any subrecipients (if applicable);
 - 3) Summarize any key accomplishments, including milestones completed for the reporting period;
 - 4) List any contracts awarded during the reporting period, along with the name of the contractor and its principal, the DUNS number of the contractor, the value of the contract, the date of award, a brief description of the services to be provided, and whether or not local preference was used in the selection of the contractor; and,
 - 5) If the recipient or any subrecipient is authorized to make subawards, list any subawards executed during the reporting period, along with the name of the entity and its principal, the DUNS number of the entity, the value of the agreement, the date of award, and a brief description of the scope of work.
 - b) In Section B-2:
 - 1) Indicate if any operational, legal, regulatory, budgetary, and/or ecological risks, and/or any public controversies, have materialized. If so, indicate what mitigation strategies have been undertaken to attenuate these risks or

controversies; and,

- 2) Summarize any challenges that have impeded the recipient's ability to accomplish the approved scope of work on schedule and on budget. If the scope of work is not on schedule, the recipient should propose a revised schedule and update its milestone report.

c) In Section B-3:

Summarize any significant findings or events, including any data compiled, collected, or created, if applicable.

d) In Section B-4:

Describe any activities to disseminate or publicize results of the activity, project, or program, including data and its repository and citations for publications resulting from this Award.

e) In Section B-5:

- 1) Describe all efforts taken to monitor contractor and/or subrecipient performance, including site visits, during the reporting period;
- 2) For subawards, indicate whether the subrecipient(s) submitted an audit to the recipient, and if so, whether the recipient issued a management decision on any findings;
- 3) For awards where Davis-Bacon Act provisions are applicable, indicate whether the recipient and/or subrecipient(s) received and reviewed certified weekly payroll records and/or whether the recipient or subrecipient(s) conducted labor interviews; and,
- 4) Describe any other activities or relevant information not already provided.

f) In Section B-6:

Summarize the activities planned for the next reporting period.

- ii. "RESTORE Act Status of Performance Report": Instructions are provided on the report form.
- iii. "RESTORE Act Milestones Report": Instructions are provided on the report form.

3. **Performance Measures**

- a. In accordance with 2 C.F.R. § 200.301, Treasury is required to measure the recipient's performance under its RESTORE Act grants to show achievement of the programs' goals and objectives, share lessons learned, improve programs' outcomes, and foster adoption of promising practices.
- b. As of May 16, 2024, Treasury has adopted the standardized performance metrics set forth in the Direct Component Performance Metrics Guidance listed on the Resources webpage at <https://home.treasury.gov/policy-issues/financial-markets-financial-institutions-and-fiscal-service/restore-act/direct-component/direct-component-resources> for RESTORE Act, Direct Component awards. Treasury will require recipients to report on these metrics for all new awards issued on or after May 16, 2024, as well as for

existing awards that receive monetary amendments on or after May 16, 2024, to fund an additional project phase or effect a material change in the project scope of work. The requirement will not apply retroactively to awards made prior to May 16, 2024, amendments to existing grants for no-cost time extensions, or monetary amendments to existing grants that are solely for the purpose of funding cost overruns at bid opening, provided that the originally approved application contained an opinion of probable cost or equivalent documentation. Recipients must report on the performance metrics for their Direct Component awards on their Performance Progress Report (PPR) via RGMS. Recipients should retain the raw data supporting any calculations or estimates used to collect and report the performance data via RGMS and make this data available upon request. Recipients have the opportunity to provide any necessary context, as desired, in the narrative responses on the recipient's Performance Progress Report.

4. **Interim Reporting on Significant Developments per 2 C.F.R. § 200.329(e)**

- a. Events may occur between the scheduled performance reporting dates that have significant impact upon the activity, project, or program. In such cases, the recipient must inform Treasury as soon as the following types of conditions become known:
 - i. Problems, delays, or adverse conditions which will materially impair the recipient's or subrecipient's ability to meet the milestones, measures, or the objectives of this Award. This disclosure must include information on the recipient's plan for corrective action taken, or contemplated, and any assistance needed to resolve the situation; and,
 - ii. Favorable developments, which enable meeting time schedules and objectives sooner or at less cost than anticipated or that produce different beneficial results than originally planned.
- b. The recipient must:
 - i. Promptly provide to Treasury and the Treasury Inspector General a copy of all state or local inspector general reports, audit reports other than those prepared under the Single Audit Act or OMB's implementing regulation at 2 C.F.R. Part 200, Subpart F - Audit Requirements, and reports of any other oversight body, if such report pertains to an award under any RESTORE Act program, including the Comprehensive Plan Component and Spill Impact Component;
 - ii. Immediately notify Treasury and the Treasury Inspector General of any indication of fraud, waste, abuse, or potentially criminal activity pertaining to grant funds; and,
 - iii. Promptly notify Treasury upon the selection of a contractor or subrecipient performing work under this Award and include the name and DUNS/UEI number for the subrecipient or contractor, and the total amount of the contract or subaward.

5. **Audit Requirements**

The recipient is responsible for complying, and ensuring all subrecipients comply, with all audit requirements set forth at 2 C.F.R. Part 200 Subpart F – Audit Requirements.

6. **Operational Self-Assessment**

The recipient must submit a revised *Operational Self-Assessment* form no later than June

30 of each calendar year for the duration of this Award. Only one *Operational Self-Assessment* must be submitted per recipient per year in the RGMS using the [RGMS Portal \(https://portal.treasury.gov/RGMS\)](https://portal.treasury.gov/RGMS). The recipient must note controls or activities that have changed from its previous submission. The PDF form of the *Operational Self-Assessment* can be found on Treasury's Direct Component Resources webpage for reference at <https://home.treasury.gov/policy-issues/financial-markets-financial-institutions-and-fiscal-service/restore-act/direct-component/direct-component-resources>.

7. **Reporting Requirements under the Federal Funding Accountability and Transparency Act (FFATA) of 2006, Pub. L. No. 109-282, as amended by the Digital Accountability and Transparency Act (DATA Act) of 2014, Pub. L. No. 113-101**

The award term set forth in Appendix A to 2 C.F.R. Part 170 applies and is set forth in Appendix I to this document.

8. **System for Award Management (SAM.gov) and Universal Identifier Requirements**

The award term set forth in Appendix A to 2 C.F.R. Part 25 applies and is as set forth in Appendix II to this document.

9. **Reporting Requirements for Status of Real Property or Interest in Real Property**

The recipient must complete and submit to Treasury a report on the status of the real property or interest in real property in which the federal government retains an interest, using a *SF-429 Real Property Status Report* form annually for the first three years after real property acquisition or completion of construction, and thereafter every five years until the end of the Estimated Useful Life or time of disposition, whichever is less. See also Section Q.

10. **Reporting on Lobbying**

- a. Solely for the purposes of reporting on lobbying, "recipient" is used as defined at 31 C.F.R. § 21.105(0), as including all contractors, subcontractors at any tier, and subgrantees at any tier of the recipient of funds received in connection with a Federal contract, grant, loan, or cooperative agreement. The term excludes an Indian Tribe, tribal organization, or any other Indian organization with respect to expenditures specifically permitted by other Federal law. Solely for the purposes of reporting on lobbying, "award recipient" refers to the recipient of this RESTORE Act award from Treasury.
- b. All recipients must comply with the provisions of 31 U.S.C. § 1352, and Treasury's implementing regulations at 31 C.F.R. Part 21. No appropriated funds may be expended by the recipient of a Federal grant to pay any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the making of any Federal grant or the extension, continuation, renewal, amendment, or modification of any Federal grant.
- c. The award recipient must include a statement in all subawards, contracts and subcontracts exceeding \$100,000 in federal funds, that the subaward, contract, or subcontract is subject to 31 U.S.C. § 1352.
- d. Each "person" who requests or receives from Treasury a RESTORE Act grant shall file with Treasury a certification, set forth in Appendix A of 31 C.F.R. Part 21, that the person has not made, and will not make, any payment prohibited under 31 U.S.C. § 1352, as amended.

- i. As defined in 31 U.S.C. § 1352(g)(3), the term "person"—includes an

individual, corporation, company, association, authority, firm, partnership, society, [State](#), and [local government](#), regardless of whether such entity is operated for profit or not for profit; but does not include an [Indian Tribe, tribal organization](#), or any other Indian organization eligible to receive Federal contracts, grants, cooperative agreements, or loans from an [agency](#) but only with respect to expenditures by such tribe or organization that are made for purposes specified in subsection (a) and are permitted by other Federal law.

- ii. The certification shall be filed pursuant to 31 C.F.R. § 21.110.
- iii. Any subrecipient, at any tier, who receives a subaward exceeding \$100,000 under this award, shall file with the tier above them a certification, set forth in appendix A of 31 C.F.R. Part 21, that the subrecipient as not made, and will not make, any payment prohibited by 31 C.F.R. § 21.100(a). Pursuant to 31 C.F.R. 21.110(d), the certification shall be filed to the next tier above.
- iv. Any contractor or subcontractor, at any tier, who receives a contract or subcontract exceeding \$100,000 under this award, shall file with the tier above them a certification, set forth in Appendix A of 31 C.F.R. Part 21, that the contractor or subcontractor has not made, and will not make, any payment prohibited by 31 U.S.C. § 1352, as amended. Pursuant to 31 C.F.R. 21.110(d), the certification shall be filed to the next tier above.
- v. Every certification filed shall be treated as a material representation of fact upon which all receiving tiers shall rely. All liability arising from an erroneous representation shall be borne solely by the tier filing that representation and shall not be shared with any tier to which the erroneous representation if forwarded. Submitting an erroneous certification or disclosure constitutes a failure to file the required certification. If a person fails to file a required certification, the United States may pursue all available remedies, including those authorized by 31 U.S.C. § 1352.
- vi. Pursuant to 31 C.F.R. § 21.110(c), every recipient must file a new disclosure form at the end of each calendar quarter in which a payment, or an agreement to make a payment, is made which would have otherwise required reporting at the time of application. Moreover, if an event occurs during the calendar quarter which materially affects the accuracy of information reported on the disclosure form previously submitted, the submitter must file a new disclosure form. Events which “materially affect” the accuracy of information already reported include:
 - a) A cumulative increase of \$25,000 or more in the amount paid or expected to be paid for influencing or attempting to influence a covered Federal action;
 - b) A change in the persons(s) influencing or attempting to influence; and/or,
 - c) A change in the Federal official(s) contacted to influence or attempt to influence a covered Federal action.
- vii. The award recipient must submit its form SF-LLLs, as well as those received from subrecipients, contractors and subcontractors, to Treasury within 30 calendar days following the end of the calendar quarter in which there occurs any event that requires disclosure or that materially affects the accuracy of the information contained in any disclosure form previously filed.
- viii. The award recipient must require subrecipients, contractors and subcontractors to submit form SF-LLL to the award recipient within 15 calendar days following the end of the calendar quarter in which there occurs any event that requires disclosure or that materially affects the

accuracy of the information contained in any disclosure from previously filed.

G FINANCIAL MANAGEMENT SYSTEM AND INTERNAL CONTROL REQUIREMENTS

1. Pursuant to 2 C.F.R. § 200.302, Recipients that are states must expend and account for Award funds in accordance with the applicable state laws and procedures for expending and accounting for the state's own funds. All other recipients must expend and account for Award funds in accordance with federal laws and procedures. In addition, all recipients' financial management systems must be sufficient to:
 - a. Permit the preparation of accurate, current, and complete SF-425, SF-PPR, RESTORE Act Milestones Report, and RESTORE Act Status of Performance Reports, as well as reporting on subawards, if applicable, and any additional reports required by any Special Award Conditions;
 - b. Permit the tracing of funds to a level of expenditures adequate to establish that such funds have been used in accordance with all applicable federal, state, and local requirements, including the RESTORE Act, Treasury implementing regulations, these Standard Terms and Conditions, Program-Specific Terms and Conditions, and any Special Award Conditions, and retain all supporting documentation to allow this tracing of funds;
 - c. Allow for the comparison of actual expenditures with the amount budgeted for each Award made to the recipient by Treasury under the RESTORE Act grant programs;
 - d. Identify and track all RESTORE Act awards received and expended by the assigned grant number, which is the Universal Award ID (as provided by Treasury), the year the Award was made, the Federal agency (Treasury), and the program's Assistance Listing number (21.015);
 - e. Record the source and application of funds for all activities funded by this Award, as well as all awards, authorizations, obligations, unobligated balances, assets, expenditures, program income, and interest earned on federal advances, and allow users to tie these records to source documentation such as cancelled checks, paid bills, payroll and attendance records, contract and subaward agreements, etc.; and,
 - f. Ensure effective control over, and accountability for, all federal funds, and all property and assets acquired with federal funds. The recipient must adequately safeguard all assets and ensure that they are used solely for authorized purposes.
2. The recipient must establish written procedures to implement the requirements set forth in section H below (Award Disbursement), as well as written procedures to determine the allowability of costs in accordance with 2 C.F.R. Part 200, Subpart E (*Cost Principles*) and the terms and conditions of this Award.
3. Pursuant to 2 C.F.R. § 200.303, the recipient must establish and maintain effective internal controls over this Award in a manner that provides reasonable assurance that the recipient is managing this Award in compliance with the RESTORE Act, Treasury's implementing regulations, these Standard Terms and Conditions, Program-Specific Terms and Conditions, and any Special Award Conditions. These internal controls should be in compliance with guidance in "Standards for Internal Control in the Federal Government" issued by the Comptroller General of the United States or the "Internal Control Integrated Framework", issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). The recipient must evaluate and monitor its compliance, and the compliance of any subrecipients, with the RESTORE Act, Treasury's implementing regulations, these Standard Terms and Conditions, Program-Specific Terms and

Conditions, and any Special Award Conditions, and promptly remedy any identified instances of noncompliance. When and if an instance of noncompliance cannot be remedied by the recipient, the recipient must promptly report the instance of noncompliance to Treasury and Treasury's Inspector General, followed by submitting a proposed mitigation plan to Treasury.

4. The recipient must take reasonable cybersecurity and other measures to safeguard information including protected personally identifiable information (PII), as defined in 2 C.F.R 200.1, and other types of information. This also includes information Treasury designates as sensitive or other information the recipient or subrecipient considers sensitive and is consistent with applicable federal, state, local and Tribal laws regarding privacy and responsibility over confidentiality.

H RECORDS RETENTION REQUIREMENTS

1. The recipient must retain all records pertinent to this Award for a period of three years from the date of submission of their final financial report (final SF-425) in accordance with 2 C.F.R. § 200.334. While electronic storage of records (backed up as appropriate) is preferable, the recipient has the option to store records in hardcopy (paper) format. For the purposes of this section, the term "records" includes but is not limited to:
 - a. Copies of all contracts and all documents related to a contract, including the Request for Proposal (RFP), all proposals/bids received, all meeting minutes or other documentation of the evaluation and selection of contractors, any disclosed conflicts of interest regarding a contract, all signed conflict of interest forms, all conflict of interest and other procurement rules governing a particular contract, and any bid protests;
 - b. Copies of all subawards and all documents related to a subaward. For competitively selected subawards, documents may include those relevant to and required by the recipient's or subrecipient's selection process such as the funding opportunity announcement or equivalent, all applications received, all meeting minutes or other documentation of the evaluation and selection of subrecipients, any disclosed conflicts of interest regarding a subaward, and all signed conflict of interest forms;
 - c. All documentation of site visits, reports, audits, and other monitoring of contractors (vendors) and subrecipients;
 - d. All financial and accounting records, including records of disbursements to contractors (vendors) and subrecipients, and documentation of the allowability of costs charged to this Award;
 - e. All supporting documentation for the performance outcome and other information reported on the recipient's SF-425s, SF-PPRs, RESTORE Act Milestones Reports, and RESTORE Act Status of Performance Reports; and,
 - f. Any reports, publications, and data sets from any research conducted under this Award.
2. If any litigation, claim, investigation, or audit relating to this Award or an activity funded with Award funds is started before the expiration of the three-year period following submission of the final financial report, the records must be retained until all litigation, claims, investigations, or audit findings involving the records have been resolved and a final action is taken.
3. If the recipient is authorized to enter into contracts to complete the approved scope of work, the recipient must include in its legal agreement with the contractor, a requirement that the contractor retain all records in compliance with 2 C.F.R. § 200.334.

4. If the recipient is authorized to make subawards, the recipient must include in its legal agreement with the subrecipient, a requirement that the subrecipient retain all records in compliance with 2 C.F.R. § 200.334.

I THE FEDERAL GOVERNMENT’S RIGHT TO INSPECT, AUDIT, AND INVESTIGATE

1. Access to Records

- a. Treasury, Treasury’s Office of Inspector General, the Government Accountability Office, or any of their authorized representatives have the right of timely and unrestricted access to any documents, papers or other records, including electronic records, of the recipient, that are pertinent to this Award, in order to perform audits, execute site visits, or for any other official use in accordance with 2 C.F.R. § 200.337. This right also includes timely and reasonable access to the recipient’s, personnel for the purpose of interview and discussion related to such documents and the Award in general. This right of access shall continue as long as records are required to be retained.
- b. If the recipient is authorized to make subawards, the recipient must include in its legal agreement or contract with the subrecipient a requirement that the subrecipient make available to Treasury, Treasury’s Office of Inspector General, the Government Accountability Office, or any of their authorized representatives any documents, papers or other records, including electronic records of the subrecipient(s), that are pertinent to this Award, in order to make audits, investigations, examinations, excerpts, transcripts, and copies of such documents. This right also includes timely and reasonable access to the subrecipient’s personnel for the purpose of interview and discussion related to such documents. This right of access shall continue as long as records are required to be retained (see Section F above).
- c. If the recipient is authorized to enter into contracts to complete the approved scope of work, the recipient must include in its contract a requirement that the contractor make available to Treasury, Treasury’s Office of Inspector General, the Government Accountability Office, or any of their authorized representatives any documents, papers or other records, including electronic records, of the contractor that are pertinent to this Award, in order to make audits, investigations, examinations, excerpts, transcripts, and copies of such documents. This right also includes timely and reasonable access to the contractor’s personnel for the purpose of interview and discussion related to such documents. This right of access shall continue as long as records are retained (see Section H above).

2. Access to the Recipients, Subrecipient’s, and Contractor’s Sites

- a. The Treasury, Treasury’s Office of Inspector General, and the Government Accountability Office shall have the right during normal business hours to conduct announced and unannounced onsite and offsite physical visits of recipients’, their subrecipients’, and contractors’ offices and project sites corresponding to the duration of their records retention obligation for this Award.

J AWARD DISBURSEMENT

1. Unless otherwise specified in a Special Award Condition, Treasury will make advance payments under this Award upon request. However, if one of the following occurs, Treasury will require Award funds to be disbursed on a reimbursement basis either with or without pre-approval of drawdown requests: (1) Treasury determines that the recipient does not meet the financial management system standards (see Section G) included in these Standard Terms and Conditions, (2) Treasury determines that the recipient has not established procedures that will minimize the time elapsing between the transfer of funds and disbursement, or (3)

Treasury determines that the recipient is in noncompliance with the RESTORE Act, Treasury's implementing regulations, other pertinent federal statutes, these Standard Terms and Conditions, Program-Specific Terms and Conditions, and/or any Special Award Conditions, and determines that the appropriate remedy is to require payment on a reimbursement basis.

2. If reimbursement is used, Treasury may require pre-approval of drawdown requests. If Treasury requires pre-approval of drawdown requests, Treasury will provide the recipient with instructions on what billing to submit. Treasury will make payment within 30 calendar days after receipt of the billing, unless Treasury determines the request to be improper, in which case payment will not be made.
3. To the extent available, the recipient must disburse funds available from program income, rebates, refunds, contract settlements, audit recoveries, and interest earned on such funds before requesting additional cash payments of Award funds.
4. Treasury will use the Department of the Treasury's Automated Standard Application for Payment (ASAP) system to disburse payments of Award funds. In order to receive payments, the recipient must first enroll in ASAP.gov. Treasury creates and funds account(s) for recipients in ASAP.gov, and recipients access their account(s) online to request funds. All Award funds will be disbursed electronically using the Automated Clearing House (ACH) for next day or future-day payments only. Awards paid through ASAP.gov may contain controls or withdrawal limits set by Treasury.
5. Requirements applicable to recipients that are states: Payment methods of state agencies or instrumentalities must be consistent with Treasury-State agreements under the Cash Management Improvement Act, Rules and Procedures for Efficient Federal-State Funds Transfers at 31 C.F.R. Part 205, and Treasury Financial Manual (TFM) 4A-2000 Overall Disbursing Rules for All Federal Agencies.
6. Requirements applicable to recipients that are not states: In accordance with 2 C.F.R. § 200.305(b), the recipient must minimize the time between the transfer of funds from Treasury and the use of the funds by the recipient. Advance payments to the recipient must be limited to the minimum amounts needed and be timed to be in accordance with the actual, immediate cash requirements of the recipient in carrying out the purpose of the approved activity, project, or program. The timing and amount of advance payments must be as close as is administratively feasible to the actual disbursements by the parish or county for activity, project, or program costs and the proportionate share of any allowable indirect costs. Advances should not be drawn down more than three business days before expenditure. Advanced funds not disbursed in a timely manner must be promptly returned to Treasury. The recipient must make timely payment to contractors (vendors) in accordance with the contract provisions.
7. Advances of federal funds must be deposited and maintained in United States Government-insured interest-bearing accounts whenever possible. The recipient is not required to maintain a separate depository account for receiving Award funds. If the recipient maintains a single depository account where advances are commingled with funds from other sources, the recipient must maintain on its books a separate subaccount for the Award funds. Consistent with the national goal of expanding opportunities for women-owned and minority-owned business enterprises, the recipient is encouraged to ensure fair consideration of women-owned and minority-owned banks (a bank which is owned at least 50 percent by women or minority group members).
8. The recipient must maintain advances of federal funds in interest-bearing accounts, unless one of the following conditions applies:
 - a. The recipient receives less than \$250,000 in federal awards per year;
 - b. The best reasonably available interest-bearing account would not be expected to earn interest in excess of \$500 per year on federal cash balances; or,

- c. The depository would require an average or minimum balance so high that it would not be feasible within the expected federal and non-federal cash resources.
- 9. Interest earned amounts up to \$500 per year may be retained by the non-federal entity for administrative expense. Any additional interest earned on federal advance payments deposited in interest-bearing accounts must be remitted annually to the Department of Health and Human Services, Payment Management System, (PMS) through an electronic medium using either Automated Clearing House (ACH) network or a Fedwire Funds Service payment.

K NOTIFICATIONS AND PRIOR APPROVALS

1. Notifications

- a. In addition to other notifications required under these Standard Terms and Conditions, the recipient must promptly notify Treasury in writing whenever a vacancy or change to key personnel listed in the award application occurs or is anticipated.
- b. Except for changes described in (2) below, the recipient may revise the budget without prior approval. If the recipient alters the budget, the recipient must provide a revised budget form (SF-424A or SF-424C, as applicable) to Treasury as an attachment to the SF-PPR, reflecting all budget revisions from the same period covered by the SF-PPR. Acceptance of such budget information does not constitute Treasury's approval of the revised budget.
- c. The recipient must notify Treasury when it increases or decreases the amount of the non-federal share of funds supporting to the project in order for Treasury to amend the approved project budget to reflect such change in the non-federal share supporting the projected funded by the Direct Component grant. The recipient must also revise the Covenant of Purpose, Use and Ownership (Covenant) to reflect Treasury's accurate percentage of participation in the project and record the executed Covenant, and submit a copy of the recorded Covenant to Treasury prior to award closeout.
- d. The recipient must notify Treasury of non-material modifications to an accepted multiyear plan with the next amended multiyear plan submitted for Treasury's review and acceptance. Modifications to a multiyear plan that would not be material modifications are: 1) changes that do not affect the overall scope or objective of the multiyear plan activity, and 2) changes that do not increase funding for an accepted multiyear plan in order to add new activities or increase the scope of an existing activity or activities. If non-material modifications to an activity in an accepted multiyear plan are included in a grant application, Treasury will evaluate the application to determine if the modified activity continues to be a Direct Component eligible activity and does not exceed the recipient's Direct Component allocation.

2. Prior Approvals

- a. The recipient must obtain prior written approval from Treasury whenever any of the following actions is anticipated:
 - i. A change in the scope or the objective of the project or program (even if there is no associated budget revision requiring prior written approval);
 - ii. A need to extend the period of performance;
 - iii. A need for additional federal funds to complete the activity, project, or program;
 - iv. The transfer of funds among direct cost categories if this Award exceeds

the Simplified Acquisition Threshold (defined at 2 C.F.R. § 200.1) and the cumulative amount of such transfers exceeds or is expected to exceed 10 percent of the total budget as last approved by Treasury;

- v. Any transfer between the non-construction and construction budget lines;
- vi. The use of funds to reimburse the recipient for pre-award costs;
- vii. The inclusion of costs that require prior approval in accordance with 2 C.F.R. Part 200, Subpart E—Cost Principles, unless described in the application and approved in this Award, including but not limited to costs related to foreign travel and research on human subjects (which includes surveys and focus groups);
- viii. The subawarding, transferring or contracting out of any work under this Award (this provision does not apply to the acquisition of supplies, material, equipment or general support services), unless described in the application and approved in this Award;
- ix. Termination of a subaward prior to the expiration of the agreement with the subrecipient;
- x. The commencement of any construction under the award;
- xi. The purchase of equipment under the award;
- xii. The use of real property in which there is a recorded federal interest for purposes other than purposes of award;
- xiii. The disposition of real property or equipment with a fair market value exceeding \$10,000; and,
- xiv. The acquisition of land unless described in the grant application and approved in this award.

L AMENDMENTS AND CLOSEOUT

1. Amendments

- a. The terms of this Award may be amended with the written approval of the recipient and Treasury.
- b. Treasury reserves the right to unilaterally amend the terms of this Award if required by federal law or regulation.
- c. An amendment is required whenever Treasury and the recipient wish to:
 - i. Make a material change to the award scope of work;
 - ii. Extend the award period of performance;
 - iii. Increase or decrease the amount of funds on a RESTORE Act grant;
 - iv. Unless described in the application and funded in the approved federal awards, the subawarding, transferring or contracting out of any work under a federal award, to include the selection of a Center or Centers of Excellence not specified in the approved scope of work, or the termination of a subaward included in the approved scope of work prior to the expiration of the agreement with the subrecipient. This provision does not apply to the acquisition of supplies, material, equipment or general support services;
 - v. Change the approved cost share provided by the recipient; or,

- vi. Transfer funds between the construction and nonconstruction budget line items.
- d. Requests for amendments must be submitted via RGMS, unless Treasury specifically waives this requirement, and must be signed by the recipient's Authorized Official;
- e. Request for amendments must contain the following information, unless otherwise indicated by Treasury:
 - i. A revised change in scope, whenever a material change in scope is requested or whenever the recipient intends to subaward, transfer or contract out of any work under a federal award, include the selection of a Center or Centers of Excellence not specified in the approved scope of work, or termination of a subaward included in the approved scope of work prior to the expiration of the agreement with the subrecipient. This scope of work should be in redline format to clearly identify the changes from the original scope of work and must include revised performance measures and a justification for the proposed revision to the scope of work;
 - ii. A revised detailed budget, whenever the recipient intends to make changes to the original approved budget to reflect a request for increased or decreased federal funding, a change in cost share funds, or transfers between line items. This detailed budget should show the original budget for each line item, the requested change for each line item, and an explanation or justification for each requested line item change;
 - iii. A revised period of performance and revised milestone chart, whenever a time extension is requested, as well as a justification for the time extension request, an explanation of how the recipient will accomplish the scope of work in the revised timeframe, and a discussion of risks that could further impact the schedule, and a risk mitigation strategy to reduce the likelihood of these schedule risks or their impact if they do occur; and,
 - iv. Any other supporting documentation as appropriate and as requested by Treasury.

2. **Closeout**

- a. Treasury will closeout this Award when it determines that all applicable administrative actions and all required work of this Award have been completed.
- b. Within 120 calendar days after the end of the award period of performance, unless the recipient requests, and Treasury approves, an extension, the recipient must submit any outstanding SF-PPR and RESTORE Act Status of Performance reports, as well as the required reporting on subawards, if applicable, plus a final SF-425 report. In the remarks section of the final SF-425 report, the recipient must describe by federal budget class category the final use of all funds received by the recipient and subrecipient (if applicable). The subrecipient must submit to the recipient, no later than 90 calendar days (or an earlier date as agreed upon by the pass-through entity and subrecipient) after the end date of the period of performance, all financial, performance, and other reports as required by the terms and conditions of the federal award. The recipient may approve an extension when requested and justified by the subrecipient.

- c. The recipient must liquidate all obligations incurred under this Award not later than 120 calendar days after the end of the award period of performance, or at closeout of the Award by Treasury.
- d. The recipient must promptly refund any balances of unobligated cash that Treasury paid. If the recipient is required to refund any balances, the recipient should contact Treasury for instructions.
- e. Following receipt of reports in paragraph (a) of this section, Treasury will make upward or downward adjustments to the allowable costs, and then make prompt payment to the recipient for allowable, unreimbursed costs.
- f. The recipient must account for any real and personal property acquired with Federal funds or received from the Federal Government in accordance with 2 C.F.R. § § 200.310 through 200.316 and § 200.330 and Section Q of these terms and conditions.
- g. If the recipient does not submit all reports in accordance with 2 C.F.R. § 200.344, and the terms and conditions of this Award within one year of the period of performance end date, Treasury will proceed to close out the Award without the missing reports. Treasury will also report the recipient's material failure to comply with the terms and conditions of this Award with the OMB-designated integrity and performance system (currently FAPIIS which is in SAM.gov) and may pursue other remedies for noncompliance, as listed in Section M.
- h. The closeout of this Award does not affect any of the following:
 - i. The right of Treasury or pass-through entity to disallow costs and recover funds on the basis of a later audit or other review. Treasury or pass-through entity must make any cost disallowance determination and notify the non-Federal entity within the record retention period;
 - ii. The requirement for the recipient to return any funds due as a result of later refunds, corrections, or other transactions including final indirect cost rate adjustments;
 - iii. The ability of Treasury to make financial adjustments to a previously closed award such as resolving indirect cost payments and making final payments;
 - iv. Compliance with the audit requirements set forth in 2 C.F.R. Part 200, Subpart F;
 - v. Compliance with the Property management and disposition requirements set forth in 2 C.F.R. § 200.310 through 200.316; and,
 - vi. Compliance with the Records retention requirements set forth in 2 C.F.R. § 200.334 through 200.337.
- i. After closeout of the Federal award, a relationship created under the Federal award may be modified or ended in whole or in part with the consent of the Federal agency or pass-through entity and the non-Federal entity, provided the responsibilities of the non-Federal entity referred to in 2 C.F.R. § 200.344(a), including those for property management as applicable, are considered and provisions made for continuing responsibilities of the non-Federal entity, as appropriate.

M TERMINATION AND REMEDIES FOR NONCOMPLIANCE

1. If Treasury determines that the recipient has failed to comply with the RESTORE Act, Treasury's implementing regulations, the Uniform Guidance, these Standard Terms and

Conditions, Program-Specific Terms and Conditions, or any Special Award Conditions, Treasury may take any of the following actions (in addition to the remedies in Section A.3, above, applicable to Direct Component awards):

- a. Impose additional Special Award Conditions such as:
 - i. Allowing payment only on a reimbursement basis, with pre-approval of drawdown requests;
 - ii. Requiring additional reporting or more frequent submission of the SF-425, SF-PPR, or RESTORE Act Status of Performance Report;
 - iii. Requiring additional activity, project, or program monitoring;
 - iv. Requiring the recipient or one or more of its subrecipients to obtain technical or management assistance; and/or,
 - v. Establishing additional actions that require prior approval;
 - b. Temporarily withhold payments pending correction of the noncompliance;
 - c. Disallow from this Award all or part of the cost of the activity or action not in compliance;
 - d. Wholly or partly suspend or terminate this Award;
 - e. Withhold additional Awards;
 - f. Initiate suspension or debarment proceedings as authorized under 2 C.F.R. Part 180 and Treasury's implementing regulations at 31 C.F.R. Part 19; and/or,
 - g. Take any other remedies that may be legally available.
2. Treasury will notify the recipient in writing of Treasury's proposed determination that an instance of noncompliance has occurred, provide details regarding the instance of noncompliance, and indicate the remedy that Treasury proposes to pursue. The recipient will have 30 calendar days to respond and provide information and documentation contesting Treasury's proposed determination or suggesting an alternative remedy.
 3. Treasury will consider any and all information provided by the recipient and issue a final determination in writing, which will state Treasury's final findings regarding noncompliance and the remedy to be imposed.
 4. In extraordinary circumstances, Treasury may require that any of the remedies above take effect immediately upon notice in writing to the recipient. In such cases, the recipient may contest Treasury's determination or suggest an alternative remedy in writing to Treasury, and Treasury will issue a final determination.
 5. Instead of, or in addition to, the remedies listed above, Treasury may refer the noncompliance to Treasury's Office of Inspector General for investigation or audit. Treasury will refer all allegations of fraud, waste, or abuse related to grants made under the Direct Component and Centers of Excellence Research Grants programs to Treasury's Inspector General.
 6. Treasury may terminate this Award in accordance with 2 C.F.R. § 200.340. Requests for termination by the recipient must also be in accordance with 2 C.F.R. § 200.340. Such requests must be in writing and must include the reasons for such termination, the effective date, and in the case of partial termination, the portion to be terminated. If Treasury determines that the remaining portion of this Award will not accomplish the purpose of this Award, Treasury may terminate this Award in its entirety.
 7. If this Award is terminated, Treasury will update or notify any relevant government-wide

systems or entities of any indications of poor performance as required by 2 C.F.R. Part 180, and Treasury's implementing regulation at 31 C.F.R. Part 19.

8. Costs that result from obligations incurred by the recipient during a suspension or after termination are not allowable unless Treasury expressly authorizes them in the notice of suspension or termination or subsequently. However, costs during suspension or after termination are allowable if: (1) the costs result from obligations which were properly incurred by the recipient before the effective date of suspension or termination and are not in anticipation of it; and (2) the costs would be allowable if the Award was not suspended or expired normally at the end of the period of performance in which the termination takes effect.
9. Notwithstanding the foregoing, consistent with 2 C.F.R. 200.340, Treasury may also **unilaterally terminate this award in whole or in part** if the award no longer effectuates the program goals or agency priorities.

N DEBTS

1. **Payment of Debts Owed the Federal Government**

- a. Any funds paid to the recipient in excess of the amount to which the recipient is finally determined to be authorized to retain under the terms of this Award constitute a debt to the federal government.
- b. Any debts determined to be owed the federal government must be paid promptly by the recipient. A debt is delinquent if it has not been paid by the date specified in Treasury's initial written demand for payment, unless other satisfactory arrangements have been made. Interest, penalties, and administrative charges (see paragraphs c, d, and e below) shall be charged on delinquent debts in accordance with 31 U.S.C. § 3717 and 31 C.F.R. § 901.9. Treasury will refer any debt that is more than 120 days delinquent to Treasury's Bureau of the Fiscal Service for debt collection services.
- c. The minimum annual interest rate to be assessed on any debts is the Department of the Treasury's Current Value of Funds Rate (CVFR). The CVFR is available online at https://www.fiscal.treasury.gov/fsreports/rpt/cvfr/cvfr_home.htm. The assessed rate shall remain fixed for the duration of the indebtedness, based on the beginning date in Treasury's written demand for payment.
- d. Penalties on any debts shall accrue at a rate of not more than 6 percent per year or such other higher rate as authorized by law.
- e. Administrative charges, that is, the costs of processing and handling a delinquent debt, shall be determined by Treasury.
- f. Funds for payment of a debt must not come from other federally sponsored programs. Verification that other federal funds have not been used will be made, e.g., during on-site visits and audits.

2. **Effect of Judgment Lien on Eligibility for Federal Grants, Loans, or Programs**

Pursuant to 28 U.S.C. § 3201(e), unless waived in writing by Treasury, a debtor who has a judgment lien against the debtor's property for a debt to the United States shall not be eligible to receive any grant or loan that is made, insured, guaranteed, or financed directly or indirectly by the United States or to receive funds directly from the federal government in any program, except funds to which the debtor is entitled as beneficiary, until the judgment is paid in full or otherwise satisfied.

O NON-DISCRIMINATION REQUIREMENTS

No person in the United States shall, on the ground of race, color, national origin, handicap, age, religion, or sex, be excluded from participation in, be denied the benefits of, or be subject to discrimination under any program or activity receiving federal financial assistance. The recipient is required to comply with all non-discrimination requirements summarized in this section, and to ensure that all subawards and contracts contain these nondiscrimination requirements.

1. **Statutory Provisions**

- a. Title VI of the Civil Rights Act of 1964 (42 U.S.C. §§ 2000d et seq.) prohibits discrimination on the grounds of race, color, or national origin under programs or activities receiving federal financial assistance;
- b. Title IX of the Education Amendments of 1972 (20 U.S.C. §§ 1681 et seq.) prohibits discrimination on the basis of sex under federally assisted education programs or activities;
- c. Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. § 794) prohibits discrimination on the basis of handicap under any program or activity receiving or benefitting from federal assistance;
- d. The Age Discrimination Act of 1975, as amended (42 U.S.C. §§ 6101 et seq.), prohibits discrimination on the basis of age in programs or activities receiving federal financial assistance;
- e. Title II of the Americans with Disabilities Act of 1990, as amended (42 U.S.C. §§ 12101 et seq.) (“ADA”), including the ADA Amendments Act of 2008 (Public Law 110-325), (“ADAAA”), prohibits discrimination on the basis of disability under programs, activities, and services provided or made available by state and local governments or instrumentalities or agencies thereto, as well as public or private entities that provide public transportation; and,
- f. Any other applicable non-discrimination law(s).

2. **Regulatory Provisions**

- a. Treasury’s Title VI regulations, 31 C.F.R. Part 22, implement Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. §§ 2000d, et seq.) which prohibits discrimination on the grounds of race, color, or national origin under programs or activities receiving federal financial assistance;
- b. Treasury’s Title IX regulations, 31 C.F.R. Part 28, implement Title IX of the Education Amendments of 1972 (20 U.S.C. §§ 1681 et seq.) which prohibits discrimination on the basis of sex under federally-assisted education programs or activities;
- c. Treasury’s Age Discrimination regulations, 31 C.F.R. Part 23, implement the Age Discrimination Act of 1975, which prohibits discrimination on the basis of age in programs and activities receiving federal financial assistance.

3. **Executive Orders**

- a. Parts II and III of EO 11246 (30 Fed. Reg. 12319, 1965), “Equal Employment Opportunity,” as amended by EO 11375 (32 Fed. Reg. 14303, 1967) and 12086 (43 Fed. Reg. 46501, 1978), require federally assisted construction contracts to include the nondiscrimination provisions of §§ 202 and 203 of EO 11246 and Department of Labor regulations implementing EO 11246 (41 C.F.R. § 60-1.4(b), 1991).
- b. EO 13166 (August 11, 2000), “Improving Access to Services for Persons With

Limited English Proficiency,” requires federal agencies to examine the services provided, identify any need for services to those with limited English proficiency (LEP), and develop and implement a system to provide those services so LEP persons can have meaningful access to them.

4. **Title VII Exemption for Religious Organizations**

Generally, Title VII of the Civil Rights Act of 1964, 42 U.S.C. §§ 2000e et seq., provides that it shall be an unlawful employment practice for an employer to discharge any individual or otherwise to discriminate against an individual with respect to compensation, terms, conditions, or privileges of employment because of such individual's race, color, religion, sex, or national origin. However, Title VII, 42 U.S.C. § 2000e-1(a), expressly exempts from the prohibition against discrimination on the basis of religion, a religious corporation, association, educational institution, or society with respect to the employment of individuals of a particular religion to perform work connected with the carrying on by such corporation, association, educational institution, or society of its activities.

5. **Protections for Whistleblowers**

In accordance with 41 U.S.C. § 4712, neither the recipient nor any of its subrecipients, contractors (vendors), or subcontractors may discharge, demote, or otherwise discriminate against an employee as a reprisal for disclosing information to a person or entity listed below that the employee reasonably believes is evidence of gross mismanagement of a federal contract or grant, a gross waste of federal funds, an abuse of authority relating to a federal contract or grant, a substantial and specific danger to public health or safety, or a violation of law, rule, or regulation related to a federal contract (including the competition for or negotiation of a contract) or grant.

The list of persons and entities referenced in the paragraph above includes the following:

- a. A Member of Congress or a representative of a committee of Congress;
- b. An Inspector General;
- c. The Government Accountability Office;
- d. A Treasury employee responsible for contract or grant oversight or management;
- e. An authorized official of the Department of Justice or other law enforcement agency;
- f. A court or grand jury; and/or,
- g. A management official or other employee of the recipient, subrecipient, vendor, contractor (vendor), or subcontractor who has the responsibility to investigate, discover, or address misconduct.

Recipients, subrecipients, and contractors shall inform its employees in writing of the rights and remedies provided under this section, in the predominant native language of the workforce.

P REQUIREMENT TO CHECK DEBARMENT AND SUSPENSION STATUS OF SUBRECIPIENTS, CONTRACTORS, SUBCONTRACTORS, AND VENDORS

- 1. Recipients that are authorized to enter into subawards or contracts to accomplish all or a portion of the approved scope of work must verify that a proposed subrecipient or contractor (if the contract is expected to equal or exceed \$25,000) or its principals does not appear on the federal government's Excluded Parties List System (EPLS) as debarred, suspended, or otherwise excluded from receiving or participating in Federal

awards prior to executing a subaward agreement or contract with that entity. Recipients may not enter into a subaward or contract with an entity that appears on the EPLS. The EPLS is accessible at <http://www.sam.gov>. See also 2 C.F.R. § 200.214.

2. The recipient must ensure that any agreements or contracts with subrecipients or contractors (vendors) require that they verify that their contractors (for contracts expected to equal or exceed \$25,000), subcontractors (for subcontracts expected to equal or exceed \$25,000), or principals that the subrecipients or contractors engage to accomplish the scope of work, if applicable, do not appear on the federal government's EPLS. Subrecipients and contractors may not enter into a contract or subcontract with an entity, or that entity's principals, if that entity or its principals appear on the EPLS.
3. The recipient must include a term or condition in all lower-tier covered transactions (subawards, contracts, and subcontracts described in 31 C.F.R. Part 19, subpart B) that the award is subject to 31 C.F.R. Part 19.

Q PROCUREMENT

1. General Provisions

- a. When procuring property and services under a Federal award, a State must follow the same policies and procedures it uses for procurements from its non-Federal funds. The State will comply with 2 C.F.R. § 200.321, 200.322, and 200.323 and ensure that every purchase order or other contract includes any clauses required by 2 C.F.R. § 200.327.
- b. All other recipients and subrecipients must follow the procurement standards in 2 C.F.R. § 200.318 through 200.327.

2. Solid Waste Disposal

The recipient must comply with Section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. The requirements of Section 6002 include procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at 40 C.F.R. Part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds \$10,000 or the value of the quantity acquired by the preceding fiscal year exceeded \$10,000; procuring solid waste management services in a manner that maximizes energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

3. Subawards

- a. When the recipient makes a subaward to a subrecipient that is authorized to enter into contracts for the purpose of completing the subaward scope of work, the recipient must require the subrecipient to comply with the requirements contained in this section.
- b. The recipient, subrecipient, contractor, and/or subcontractor must not sub-grant or sub-contract any part of the approved project to any agency or employee of Treasury and/or other federal department, agency, or instrumentality without the prior written approval of Treasury. Treasury will notify the recipient in writing of the final determination.

4. Small Businesses, Minority, Women, and Veteran-Owned Business Enterprises

Pursuant to 2 C.F.R. § 200.321, recipients and subrecipients must take all necessary

affirmative steps to assure that small businesses, minority businesses, women's business enterprises, veteran-owned businesses, and labor surplus area firms are used when possible. Such consideration means:

- a. These business types are included on solicitation lists;
- b. These business types are solicited whenever they are deemed eligible as potential sources;
- c. Dividing procurement transactions into separate procurements to permit maximum participation by these business types;
- d. Establishing delivery schedules (for example, the percentage of an order to be delivered by a given date of each month) that encourage participation by these business types;
- e. Utilizing organizations such as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce; and ,
- f. Requiring contractor, under a Federal award to apply this section to subcontracts.

5. **Domestic Preference for Procurement**

Recipients are encouraged, to the greatest extent practicable, to provide a preference for the purchase, acquisition, or use of goods, products, or material produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products).

See 2 C.F.R. § 200.322 for definitions of "manufactured products" and "produced in the United States." This requirement must be included in all subawards including all contracts and purchase orders for work or products under this award pursuant to 2 C.F.R. § 200.322 and Executive Order 14005 Ensuring the Future is Made in All of America by All of America's Worker (January 25, 2021). For infrastructure projects, recipients must comply with the Buy America preference set forth in 2 C.F.R. Part 184.

R ENVIRONMENTAL REQUIREMENTS

The recipient must comply with all environmental standards, and provide information requested by Treasury relating to compliance with environmental standards, including but not limited to the following federal statutes, regulations, and EOs. If the recipient is permitted to make any subawards, the recipient must include the environmental statutes, regulations, and executive orders listed below in any agreement or contract with a subrecipient, and require the subrecipient to comply with all of these and to notify the recipient if the subrecipient becomes aware of any impact on the environment that was not noted in the recipient's approved application package:

1. National Historic Preservation Act, as amended (54 U.S.C. § 300101 et seq.) and Archeological and Historic Preservation Act, as amended (54 U.S.C. § 312501 et seq.)
2. The National Environmental Policy Act of 1969, as amended (42 U.S.C. § 4321 et seq.)
3. Clean Air Act, as amended (42 U.S.C. § 7401 et seq.), Clean Water Act, as amended (33 U.S.C. § 1251 et seq.), and EO 11738
4. The Flood Disaster Protection Act of 1973, as amended (42 U.S.C. § 4002 et seq.)
5. The Endangered Species Act of 1973, as amended, (16 U.S.C. § 1531 et seq.)
6. The Coastal Zone Management Act, as amended, (16 U.S.C. § 1451 et seq.)
7. The Coastal Barriers Resources Act, as amended, (16 U.S.C. § 3501 et seq.)
8. The Wild and Scenic Rivers Act, as amended, (16 U.S.C. § 1271 et seq.)
9. The Safe Drinking Water Act of 1974, as amended, (42 U.S.C. § 300f-j)
10. The Resource Conservation and Recovery Act of 1976, as amended, (42 U.S.C. §

6901 et seq.)

11. The Comprehensive Environmental Response, Compensation, and Liability Act (Superfund) (42 U.S.C. § 9601 et seq.) and the Community Environmental Response Facilitation Act (42 U.S.C. § 9601 note)
12. Magnuson-Stevens Fishery Conservation and Management Act, as amended (16 U.S.C. §1801)
13. Marine Mammal Protection Act, as amended (16 U.S.C § 31)
14. Migratory Bird Treaty Act, as amended (16 U.S.C. §§ 703-712)
15. Responsibilities of Federal Agencies to Protect Migratory Birds, EO 13186
16. Bald and Golden Eagle Protection Act, as amended (16 U.S.C. § 668-668d)
17. Marine Protection, Research and Sanctuaries Act (33 U.S.C. §§ 1401-1445 and 16 U.S.C. § 1431—1445)
18. National Marine Sanctuaries Act, as amended (16 U.S.C. § 1431 et seq.)
19. Rivers and Harbors Act of 1899 (33 U.S.C § 407)
20. Environmental Justice in Minority Populations and Low-Income Populations, EO 12898, as amended
21. Flood Management, EO 11988, as amended by EO 13690, which was revoked by EO 13807 on August 15, 2017 and reinstated by EO 14030 on May 20, 2021, reestablishing the Federal Flood Risk Management Standard (FFRMS)
22. Protection of Wetland, EO11990, May 24, 177, as amended by EO 12608
23. Farmland Protection Policy Act, as amended (7 U.S.C. § 4201 et. seq.)
24. Coral Reef Protection, EO 13089
25. Invasive Species, EO 13112

S REAL PROPERTY, CONSTRUCTION, EQUIPMENT, AND SUPPLIES

1. **General Requirements**
 - a. The recipient must comply with the property standards at 2 C.F.R. § 200.310 through 200.316 for real property, equipment, supplies, and intangible property.
2. **Real Property and Acquisition of Land and Land Interests**
 - a. No real property or interest in real property may be acquired under this Award unless authorized in the approved scope of work.
 - b. In accordance with 31 C.F.R. § 34.803(f), no land or interests in land, such as easements, or right of ways, may be acquired under this Award unless the recipient can provide documentation satisfactory to Treasury that the land or interest in land was acquired by purchase, exchange, or donation from a willing seller.
3. **Compliance with State, Local and Federal Requirements**

The project must comply with all applicable federal laws and regulations, and with all requirements for state, and local laws and ordinances to the extent that such requirements do not conflict with federal laws. The recipient is also responsible for supervising the design, bidding, construction, and operation of construction projects in compliance with all

award requirements. The recipient must comply with, and must require all contractors and subcontractors, to comply with all federal, state, and local laws and regulations. The recipient must ensure compliance with special award conditions which may contain conditions that must be satisfied prior to advertisement of bids, start of construction, or another critical event.

4. **Title**

- a. Prior to receiving Treasury authorization to start construction, the recipient must furnish evidence, satisfactory to Treasury, that the recipient has acquired good and merchantable title free of all mortgages, foreclosable liens, or encumbrances, to all land, rights of way, and easements necessary for the completion of the project.
- b. When property has been newly acquired for the project, the recipient must provide the following as evidence of clear title to the property:
 - i. A copy of the recorded deed or equivalent conveyance document showing the recipient acquired title to the property; and,
 - ii. A copy of the title insurance (also known as title policy), title report, or title opinion (by attorney(s) licensed in the jurisdiction where the property is located) completed after the real estate acquisition showing the recipient obtained title to the property free of any encumbrances (i.e., foreclosable liens, easements, or any other limitations on use that interferes with the recipient's intended use, operation, construction, maintenance of the property, or Treasury's federal interest). The title insurance, title report, or title opinion should include the legal description of the property.
- c. When the property to be used for the project has not been newly acquired, the recipient must provide evidence of clear title to the property, which includes both of the items listed in (b) above, provided that the copy of the title insurance, title report, title opinion, or equivalent must be completed within a year of the recipient requesting Treasury's approval of its request to proceed with construction on a project. If such evidence is more than one year old, the recipient must provide Treasury with an explanation, which Treasury may in its discretion decline to accept.
- d. When easements, rights-of-way, or other rights are required for the completion of the project, the recipient must provide the following documentation:
 - i. A copy of the easement deed or equivalent conveyance document; and
 - ii. A copy of the title insurance, title report, or title opinion (by attorney(s) licensed in the jurisdiction where the property is located).
- e. When use of or access to leased property is required for the project, the recipient must provide the following evidence of control of the leased property:
 - i. A copy of the lease signed by the lessor and recipient that provides a lease term equivalent to the estimated useful life (EUL) of the project or renewable for that period; and,
 - ii. A certification from the recipient that it has control of all project property or improvements to the property and is not aware of any material restrictions or encumbrances that could interfere with any award purpose for the duration of the EUL. If this changes within the course of the EUL, the recipient must provide timely notice to Treasury. The federal interest may be waived, if it is decided that recording the federal interest is not feasible, then Treasury may include a special award condition on the award that the recipient will repay the federal interest if the lessor terminates the lease before the EUL of the project expires or if the recipient or lessor uses the property in a manner

inconsistent with the public purpose(s) of the award during the EUL of the improvements or construction, as applicable.

- f. When the project involves linear construction/improvement, road construction, or other less common types of construction, recipients should contact Treasury for guidance on the types of evidence of title required.
- g. Notwithstanding (a)-(f), Treasury may in its discretion accept only a copy of the title insurance, title report, title opinion, or equivalent as evidence of title (or easement or other rights) if the recipient is unable to produce the relevant conveyance document.
- h. In all cases, recipients must disclose any ongoing litigation concerning the project property prior to seeking Treasury's permission to proceed with construction.

5. **Permitting Requirements**

Prior to receiving Treasury permission to proceed with construction, the recipient must furnish evidence, satisfactory to Treasury, that recipient has received all federal, state and local permits necessary for the completion of the project. In extraordinary circumstances and at Treasury's sole discretion, Treasury may accept alternate documentation such as, draft permits, which must be finalized within a specified time as determined by Treasury after approval of a request for notice to proceed with construction.

6. **Estimated Useful Life**

- a. Property that is acquired or improved, in whole or in part, with federal assistance is held in trust by the recipient for the purpose(s) for which the award was made for the Estimated Useful Life. Estimated Useful Life means the period of years that constitutes the expected useful lifespan of a project, as determined by Treasury. The recipient must propose an Estimated Useful Life from the date of construction completion either prior to award or initiation of construction. If the Estimated Useful Life is provided in the application, Treasury's issuance of the grant agreement represents its concurrence with the recipient's proposed Estimated Useful Life.
- b. The recipient's obligation to the federal government continues for the Estimated Useful Life of the project, as determined by Treasury, during which Treasury retains an undivided equitable reversionary interest (the "federal interest") in the property acquired or improved, in whole or in part, with Treasury's investment.
- c. If Treasury determines that the recipient has failed or fails to meet its obligations under the terms and conditions of this award, Treasury may exercise its rights or remedies with respect to its federal interest in the project. However, Treasury's forbearance in exercising any right or remedy in connection with the federal interest does not constitute a waiver thereof.
- d. At its discretion, Treasury may waive the requirement to establish an Estimated Useful Life for environmental restoration projects.

7. **Recording the Federal Interest in the Real Property**

Pursuant to 2 C.F.R. § 200.316, Treasury retains an undivided equitable reversionary interest in real property (a "federal interest") that is acquired or improved, in whole or in part with RESTORE Act Direct Component funds, which must be held in trust by the recipient for the benefit of the project for the Estimated Useful Life of the project.

To document the federal interest, the recipient must prepare and properly record a "Covenant of Purpose, Use and Ownership" (Covenant), or, where a subrecipient is the title owner, the recipient must ensure that the subrecipient prepares and properly records a "Covenant of Purpose, Use and Ownership" (Covenant) on the property acquired or

improved with RESTORE Act Direct Component funds. This Covenant does not establish a traditional mortgage lien in that it does not establish a traditional creditor relationship requiring the periodic repayment of principal and interest, or the ability of Treasury to foreclose on the real property at any time. Rather, pursuant to the Covenant, the recipient and/or the subrecipient, as applicable, acknowledges that it holds title to the real property in trust for the public purposes of the financial assistance award and agrees, among other commitments, that it will repay the federal interest if it disposes of or alienates its interest in the real property, or uses it in a manner inconsistent with the public purposes of the award, during the Estimated Useful Life of the property.

- a. The Covenant must be satisfactory in form and substance to Treasury and must include the name and current address of the recipient and/or subrecipient (if applicable), the award number, amount, date of award, subrecipient agreement (if applicable), date of the purchase of property (if applicable), and the Estimated Useful Life of the project. It must also include statements that the real property will only be used for purposes consistent with the RESTORE Act and Treasury's implementing regulations, 31 C.F.R. Part 34; that it will not be mortgaged or used as collateral, sold, or otherwise transferred to another party without the written permission of Treasury; and that the federal interest cannot be subordinated, diminished, nullified, or released through encumbrance of the property, transfer of the property to another party, or any other action the recipient/subrecipient takes without the written permission of Treasury.
- b. The recipient agrees to provide to Treasury a title insurance (also known as title policy), title report, or title opinion as to the title owner of the property, and to properly record the Covenant, in accordance with applicable law in the real property records in the jurisdiction in which the real property is located in order to provide public record notice to interested parties that there are certain restrictions on the use and disposition of the real property during its Estimated Useful Life, and that Treasury retains an undivided equitable reversionary interest in the real property to the extent of its participation in the project for which funds have been awarded.
- c. Treasury requires title insurance, a title report, or a title opinion from the recipient to substantiate that the Covenant has been properly recorded.
- d. Failure to properly and timely file and maintain documentation of the federal interest may result in appropriate enforcement action, including, but not limited to, disallowance of the cost of the acquisition or improvement by Treasury.
- e. The Federal Interest must be perfected and recorded/filed in accordance with state and/or local law concurrent with the acquisition of the real property, where an award includes real property acquisition, and for construction of buildings and projects to improve the real property, no later than the date construction and/or improvement work commences.
- f. When the Estimated Useful Life of the project is ended, the federal interest is extinguished, and Treasury has no further interest in the real property.
- g. Exclusions from the requirement that the federal interest on real property be recorded will be at Treasury's sole discretion. The types of projects for which Treasury may agree to this exclusion include, but are not limited to, the following: work which involves no above grade structures, work within utility easements, work on leased property, improvements to state parks, water and sewer lateral line projects affecting private properties, and shoreline stabilization projects and other restoration projects.

8. **Use of Real Property**

Encumbering real property on which there is a federal interest without prior Treasury approval is an unauthorized use of the property and of project trust funds under this award. See 2 C.F.R. § 200.316. Real property or interest in real property may not be used for purposes other than the authorized purpose of the award without the express, prior written approval of Treasury, for as long as Treasury retains an interest in the property. The property must not be sold, conveyed, transferred, assigned, mortgaged, or in any other manner encumbered except as expressly authorized in writing by Treasury. The recipient must maintain facilities constructed or renovated with grant funds in a manner consistent with the purposes for which the funds were provided for the duration of the Estimated Useful Life.

In the event that the real property or interest in real property is no longer needed for the originally authorized purpose, the recipient must obtain disposition instructions from Treasury consistent with 2 C.F.R. § 200.311(d).

9. **Administration, Operation, and Maintenance**

The recipient agrees to administer, operate, and maintain the project for its Estimated Useful Life in the same manner in which it operates and maintains similar facilities and equipment owned by it, and in accordance with state and local standards, laws and regulations. The recipient must not be in breach of its obligations under this award except to the extent the failure to fulfill any obligation is due to an Uncontrollable Force.

“Uncontrollable Force” means an event beyond the reasonable control of, and without the fault or negligence of, the party claiming the Uncontrollable Force that prevents the recipient from honoring its contractual obligations under this Agreement and which, by exercise of the recipient’s reasonable care, diligence and foresight, such recipient was unable to avoid. Uncontrollable Forces include, but are not limited to:

- a. Strikes or work stoppage;
- b. Floods, earthquakes, or other natural disasters;
- c. Terrorist acts; and,
- d. Final orders or injunctions issued by a court or regulatory body having competent subject matter jurisdiction which the recipient, claiming the Uncontrollable Force, after diligent efforts, was unable to have stayed, suspended, or set aside pending review by a court of competent subject matter jurisdiction. Neither the unavailability of funds or financing, nor conditions of national or local economies or markets must be considered an Uncontrollable Force.

10. **Commencement of Construction**

The recipient must not commence construction prior to the date of the Award. The recipient must make a written request to Treasury for permission to commence with construction after the construction contractor has been selected and at least 30 days prior to construction. For project costs to be eligible for Treasury reimbursement, Treasury must determine that the award of all contracts with associated costs are in compliance with the scope of the project and all terms and conditions of this award, and that all necessary permits have been or will be obtained, all Special Award Conditions tied to the commencement of construction have been satisfied, and the federal interest is secure. No construction funds may be drawn from ASAP without Treasury’s written permission. If the recipient commences construction prior to Treasury’s determination, the recipient proceeds at its own risk.

Treasury will only review contract amendments or change orders which change the scope of a contract.

11. **Insurance**

The recipient must, at a minimum, provide the equivalent insurance coverage for real property improved with federal funds as provided to property owned by the recipient state, county or parish, in compliance with 2 C.F.R. § 200.310.

12. **Bonding**

For construction or facility improvement contracts or subcontracts exceeding the simplified acquisition threshold, the recipient or pass-through entity may request in writing that Treasury accept its bonding policy and requirements. If Treasury determines that the federal interest in the project is adequately protected, the recipient or pass-through entity need not comply with the following three bonding requirements. In accordance with 2 C.F.R. § 200.326, for all other recipients and pass-through entities, the minimum requirements for construction or facility improvement contracts or subcontracts exceeding the simplified acquisition threshold are as follows:

- a. A bid guarantee from each bidder equivalent to five percent of the bid price. The bid guarantee must consist of a firm commitment such as a bid bond, certified check, or other negotiable instrument accompanying a bid as assurance that the bidder will, upon acceptance of the bid, execute any required contractual documents within the specified timeframe.
- b. A performance bond on the part of the contractor's part for 100 percent of the contract price. A performance bond is a bond executed in connection with a contract to secure the fulfillment of all the contractor's requirements under a contract.
- c. A payment bond on the part of the contractor's part for 100 percent of the contract price. A "payment bond" is a bond executed in connection with a contract to assure payment as required by law of all persons supplying labor and material in the execution of the work provided for under a contract.

13. **Floodplain Requirements**

In accordance with 44 C.F.R. Part 9, prior to Treasury's permission to commence construction in a designated 100-year floodplain, the recipient must provide evidence satisfactory to Treasury of a Floodplain Notice, that the 30-day period established for receipt of comments from the public in response to public notice published regarding the potential for adverse project impact on the values and functions of a designated 100-year floodplain has expired and that identified concerns (if any) have been addressed to Treasury's satisfaction. This notice may be satisfied through a federal/state environmental assessment process used as the vehicle for public notice, involvement, and explanation per 44 C.F.R. § 9.8(2).

In addition, prior to Treasury's authorization to commence construction of structures and/or buildings within a designated 100-year floodplain, the recipient must provide evidence satisfactory to Treasury of the following:

- a. Floodplain Protection: That the project engineer/architect has certified that the project facility will be adequately protected from damage by floods in this area of apparent potential flood hazard. The evidence must include adequate justification for the Base Flood Elevation designation for the financial assistance award site.
- b. Floodplain Insurance: That the community is participating in the National Flood Insurance Program, and that as required, the recipient will purchase flood insurance.

14. **Goals for Women and Minorities in Construction**

Department of Labor regulations set forth in 41 C.F.R. § 60-4 establish goals and timetables for participation of minorities and women in the construction industry. These regulations apply to all federally assisted construction contracts in excess of \$10,000. The recipient must comply with these regulations and must obtain compliance with 41 C.F.R. § 60-4 from contractors and subcontractors employed in the completion of the project by including such notices, clauses and provisions in the Solicitations for Offers or Bids as required by 41 C.F.R. § 60-4.

- a. The goal for participation of women in each trade area must be as follows: From April 1, 1981, until further notice: 6.9 percent;
- b. All changes to this goal, as published in the Federal Register in accordance with the Office of Federal Contract Compliance Programs regulations at 41 C.F.R. § 60-4.6, or any successor regulations, must hereafter be incorporated by reference into these Special Award Conditions; and,
- c. Goals for minority participation must be as prescribed by Appendix B-80, Federal Register, Volume 45, No. 194, October 3, 1980, or subsequent publications. The recipient must include the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" (or cause them to be included, if appropriate) in all federally assisted contracts and subcontracts. The goals and timetables for minority and female participation may not be less than those published pursuant to 41 C.F.R. § 60-4.6.

15. **Davis Bacon Act, as amended (40 U.S.C. §§ 3141–3148)**

Davis-Bacon Act-related provisions outlined in 33 U.S.C. § 1372 are applicable to RESTORE Act grants that fund a construction project that is a "treatment works" project as defined in 33 U.S.C. § 1292; or a construction project regardless of whether it is a "treatment works" project when RESTORE Act Direct Component grant funds are used on a construction project in conjunction with federal assistance from another federal agency operating under an authority that requires the enforcement of Davis-Bacon Act-related provisions.

- a. "Treatment works" is defined in 33 U.S.C. § 1292, and means any:
 - i. Devices and systems:
 - 1) Used in the storage, treatment, recycling, and reclamation of municipal sewage or industrial wastes of a liquid nature to implement 33 U.S.C. § 1281; or,
 - 2) Necessary to recycle or reuse water at the most economical cost over the estimated life of the works, including intercepting sewers, outfall ewers, sewage collection systems, pumping, power, and other equipment, and their appurtenances; extensions, improvements, remodeling, additions, and alterations to those devices and system; and,
 - ii. Elements essential to provide a reliable recycled supply of water such as standby treatment units and clear well facilities;
 - iii. Acquisition of the land that will be an integral part of the treatment process (including land used for the storage of treated wastewater in land treatment systems prior to land application) or will be used for ultimate disposal of residues resulting from such treatment and acquisition of other land, and interests in land, that are necessary for construction; or,

- iv. Any other method or system for preventing, abating, reducing, storing, treating, separating, or disposing of municipal waste, including storm water runoff, or industrial waste, including waste in combined storm water and sanitary sewer systems.
- b. When Davis-Bacon Act-related provisions applies, the recipient must include a provision for compliance with the Davis-Bacon Act (40 U.S.C. §§ 3141–3144, and §§ 3146–3148) as supplemented by Department of Labor regulations (29 C.F.R. Part 5, “Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction”) in all prime construction contracts in excess of \$2,000 which is entered into for the actual construction, alteration and/or repair, including painting and decorating, of a public building or public work, or building or work financed in whole or in part from Federal funds. The recipient must place a copy of the current prevailing wage determination issued by the Department of Labor in each solicitation. For information on the current prevailing wage rate determination for a specific locality go to <https://sam.gov/content/wage-determinations>. If there is no prevailing wage rate determination for your locality, recipients should contact the U.S. Department of Labor at 1-866-487-2365 on how to obtain a prevailing wage rate determination.
- c. The decision to award a contract or subcontract must be conditioned upon the acceptance of the wage determination. In accordance with the statute and regulations, contractors are required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor and required to pay wages not less than once a week. The contractor shall submit weekly for each week in which any contract work is performed, a copy of all payrolls to the recipient. The required weekly payroll information may be submitted in any form desired. A contractor may use Form WH–347 which is available at <https://www.dol.gov/agencies/whd/government-contracts/construction/payroll-certification>.
- d. The prime contractor shall be responsible for compliance by any subcontractor or lower-tier subcontractor. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. The recipient must report all suspected or reported violations to Treasury.
- e. The wage determination (including any additional classification and wage rates) and the Davis-Bacon poster (WH–1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers. The posters can be found at <https://www.dol.gov/whd/programs/dbra/wh1321.htm>.
- f. The recipient must include all the following contract clauses outlined in 29 C.F.R. § 5.5(a) in all construction contracts subject to the Davis-Bacon and Related Acts requirements, which are in excess of \$2,000 and entered into for the actual construction, alteration and/or repair, including painting and decorating, of a public building or public work, or building or work financed in whole or in part from RESTORE Act Direct Component grant funds, and ensure that any subrecipient also includes these contract clauses in all construction contracts subject to the Davis-Bacon Act requirements (see Appendix III of this document).
- g. **Contract Provision for Contracts in Excess of \$100,000: Contract Work Hours and Safety Standards Act.** All contracts awarded by the recipient or subrecipient in excess of \$100,000 that involve the employment of mechanics or laborers must include a provision for compliance with 40 U.S.C. §§ 3702 and 3704, as

supplemented by Department of Labor regulations at 29 C.F.R. § 5.5(b). Under 40 U.S.C. § 3702, each contractor must be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. § 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. **These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.** The recipient or subrecipient shall insert the clauses set forth in 29 C.F.R. § 5.5(b)(1) through (4) in full in any contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 C.F.R. § 5.5(a). As used in this paragraph, the terms laborers and mechanics include watchmen and guards. See Appendix IV of this document for the Contract Clauses Required for Contracts Subject to the Requirements of the Contract Work Hours and Safety Standards Act.

- h. In addition to the clauses contained in 29 C.F.R. § 5.5(b), in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in 29 C.F.R. § 5.1, the recipient or subrecipient shall insert a clause requiring that the contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, the recipient or subrecipient shall insert in any such contract a clause providing that the records to be maintained under this paragraph shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the recipient, Department of Treasury, and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.
- i. **Enforcement:** In accordance with 29 C.F.R. § 5.6(a)(1), Treasury has the responsibility to ascertain whether the clauses required by 29 C.F.R. § 5.5 have been inserted in the contracts subject to the labor standards provisions of the Acts contained in 29 C.F.R. § 5.1. Pursuant to 29 C.F.R. § 5.6(a)(3), Treasury may cause investigations to be made by the recipient as may be necessary to ensure compliance with the labor standards clauses required by 29 C.F.R. § 5.5 and the applicable statutes listed in 29 C.F.R. § 5.1. Investigations shall be made of all contracts with such frequency as may be necessary to ensure compliance. Such investigations shall include interviews with employees, which shall be taken in confidence, and examinations of payroll data and evidence of registration and certification with respect to apprenticeship and training plans. In making such examinations, particular care shall be taken to determine the correctness of classifications and to determine whether there is a disproportionate employment of laborers and of apprentices or trainees registered in approved programs. Such investigations shall also include evidence of fringe benefit plans and payments thereunder. Complaints of alleged violations shall be given priority.

16. **Equal Opportunity Clause**

Pursuant to 41 C.F.R. § 60-1.4(b), federally-assisted construction contracts, for construction which is not exempt from the requirements of the equal opportunity clause, 41 C.F.R. Part 60-1—Obligations of Contractors and Subcontractors, the recipient hereby agrees that it will incorporate or cause to be incorporated into any contract for construction work, or modification thereof, as defined in the regulations of the Secretary of Labor at 41 C.F.R. Chapter 60, which is paid for in whole or in part with funds obtained from the federal government or borrowed on the credit of the federal government pursuant to a grant, contract, loan, insurance, or guarantee, or undertaken pursuant to any federal program involving such grant, contract, loan, insurance, or guarantee, the following equal opportunity clause: See Appendix V for the full text of 41 C.F.R. § 60-1.4.

17. **Revised Americans with Disabilities Act (ADA) Standards for Accessible Design for Construction Awards**

The U.S. Department of Justice has issued revised regulations implementing Title II of the ADA (28 C.F.R. Part 35) and Title III of the ADA (28 C.F.R. Part 36). The revised regulations adopted new enforceable accessibility standards called the “2010 ADA Standards for Accessible Design” (2010 Standards). The 2010 Standards are an acceptable alternative to the Uniform Federal Accessibility Standards (UFAS). Treasury deems compliance with the 2010 Standards to be an acceptable means of complying with the Section 504 accessibility requirements for new construction and alteration projects. All new construction and alteration projects must comply with the 2010 Standards.

18. **Supplies and Equipment**

a. Requirements that are applicable to recipients that are states:

- i. Equipment: The recipient must use, manage, and dispose of equipment acquired under this Award in accordance with state laws and procedures.
- ii. Supplies: If the recipient has a residual inventory of unused supplies exceeding \$10,000 in total aggregate value upon termination or completion of the activity, project, or program and the supplies are not needed for any other federal award, the recipient must report the value and the retention or sale of such supplies by submitting to Treasury a completed *SF-428 Tangible Personal Property Report* and *SF-428-B Final Report Form* no later than 60 days after the end of the Period of Performance.

b. Requirements that are applicable to recipients that are not states:

- i. Equipment and Supplies: During the period of performance, the recipient must seek disposition instructions from Treasury for equipment and/or unused or residual supplies acquired under this Award if the current fair market value of the equipment and/or unused or residual supplies is greater than \$10,000 per unit. The recipient must seek disposition instructions before disposing of the property by submitting a completed *SF-428 Tangible Personal Property Report* and *SF-428-C Disposition Request/Report*. Not later than 60 days after the end of the period of performance, the recipient must submit to Treasury a completed *SF-428 Tangible Personal Property Report* and *SF-428-B Final Report Form* if the recipient retains any equipment with a current fair market value greater than \$10,000 per unit or a residual inventory of unused supplies exceeding \$10,000 in total aggregate value upon termination

or completion of the activity, project, or program and the equipment and/or supplies are not needed for any other federal award.

T MISCELLANEOUS REQUIREMENTS AND PROVISIONS

The recipient must comply with all miscellaneous requirements and provisions described in this section and, when applicable, require its subrecipients, contractors, and subcontractors to comply. This list is not exclusive:

1. Prohibition Against Assignment by the Recipient

Notwithstanding any other provision of this Award, the recipient must not transfer, pledge, mortgage, or otherwise assign this Award, or any interest therein, or any claim arising thereunder, to any party or parties, banks, trust companies, or other financing or financial institutions without the express written approval of Treasury.

2. Disclaimer Provisions

- a. The United States expressly disclaims any and all responsibility or liability to the recipient or third persons for the actions of the recipient or third persons resulting in death, bodily injury, property damages, or any other losses resulting in any way from the performance of this Award or any other losses resulting in any way from the performance of this Award or any subaward, contract, or subcontract under this Award.
- b. The acceptance of this Award by the recipient does not in any way constitute an agency relationship between the United States and the recipient.

3. Prohibited and Criminal Activities

- a. The Program Fraud Civil Remedies Act of 1986 (31 U.S.C. §§ 3801-3812), provides for the imposition of civil penalties against persons who make false, fictitious, or fraudulent claims to the federal government for money (including money representing grants, loans or other benefits).
- b. False Statements, as amended (18 U.S.C. § 1001) provides that whoever makes or presents any materially false, fictitious, or fraudulent statements to the United States shall be subject to imprisonment of not more than five years.
- c. False, Fictitious, or Fraudulent Claims, as amended (18 U.S.C. § 287) provides that whoever makes or presents a false, fictitious, or fraudulent claim against or to the United States shall be subject to imprisonment of not more than five years and shall be subject to a fine in the amount provided in 18 U.S.C. § 287.
- d. False Claims Act (31 U.S.C. §§ 3729-3732), provides that suits under this act can be brought by the federal government, or a person on behalf of the federal government, for false claims under federal assistance programs.
- e. Copeland "Anti-Kickback" Act (41 U.S.C §§ 1320a-7b(b)) prohibits a person or organization engaged in a federally supported project from enticing an employee working on the project from giving up a part of his compensation under an employment contract. The Copeland "Anti-Kickback" Act also applies to contractors and subcontractors pursuant to 40 U.S.C. § 3145.

4. Limitations on Political Activities of Employees

The recipient must comply, as applicable, with provisions of the Hatch Act, as amended (5 U.S.C. §§ 1501-1508 and §§ 7321-7326) which limit the political activities of employees whose principal employment activities are funded in whole or in part with federal funds.

5. **Drug-Free Workplace**

The recipient must comply with the provisions of the Drug-Free Workplace Act of 1988 (Public Law 100-690, Title V, Sec. 5153, as amended by Public Law 105-85, Div. A, Title VIII, Sec. 809, as codified at 41 U.S.C. § 8102), and Treasury implementing regulations at 31 C.F.R. Part 20, which require that the recipient take steps to provide a drug-free workplace.

6. **Increasing Seat Belt Use in the United States**

Pursuant to Executive Order 13043, 62 FR 19217 (Apr. 8, 1997), Recipient should encourage its employees and should encourage contractors to adopt and enforce on-the-job seat belt policies and programs for their employees when operating company-owned, rented or personally owned vehicles.

7. **Reducing Text Messaging While Driving**

Pursuant to Executive Order 13513, 74 FR 51225 (Oct. 1, 2009), recipient should encourage its employees, subrecipients, and contractors to adopt and enforce policies that ban text messaging while driving, and recipient should establish workplace safety policies to decrease accidents caused by distracted drivers.

8. **Minority Serving Institutions (MSIs) Initiative**

Pursuant to EOs 13555 and 13270, as amended, Treasury is strongly committed to broadening the participation of MSIs in its financial assistance programs. Treasury's goals include achieving full participation of MSIs in order to advance the development of human potential, strengthen the nation's capacity to provide high-quality education, and increase opportunities for MSIs to participate in and benefit from federal financial assistance programs. Treasury encourages recipients to include meaningful participation of MSIs. Institutions eligible to be considered MSIs are listed on the Department of Education website at <http://www2.ed.gov/about/offices/list/ocr/edlite-minorityinst.html>.

9. **Research Misconduct**

Treasury adopts, and applies to Awards for research, the Federal Policy on Research Misconduct (Federal Policy) issued by the EO of the President's Office of Science and Technology Policy on December 6, 2000 (65 Fed. Reg. 76260 (2000)). As provided for in the Federal Policy, research misconduct refers to the fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results. Research misconduct does not include honest errors or differences of opinion. Recipients that conduct research funded by Treasury must foster an atmosphere conducive to the responsible conduct of sponsored research by safeguarding against and resolving allegations of research misconduct. Recipients also have the primary responsibility to prevent, detect, and investigate allegations of research misconduct and, for this purpose, may rely on their internal policies and procedures, as appropriate, to do so. Award funds expended on an activity that is determined to be invalid or unreliable because of research misconduct may result in appropriate enforcement action under the Award, up to and including Award termination and possible suspension or debarment. Treasury requires that any allegation that contains sufficient information to proceed with an inquiry be submitted to Treasury, which will also notify Treasury's Office of Inspector General of such allegation. Once the recipient has investigated the allegation, it will submit its findings to Treasury. Treasury may accept the recipient's findings or proceed with its own investigation; Treasury

shall inform the recipient of Treasury's final determination.

10. **Care and Use of Live Vertebrate Animals**

Recipients must comply with the Laboratory Animal Welfare Act of 1966 (Public Law 89-544), as amended, (7 U.S.C. § 2131 et seq.) (animal acquisition, transport, care, handling, and use in projects), and implementing regulations, 9 C.F.R. Parts 1, 2, and 3; the Endangered Species Act, as amended, (16 U.S.C. § 1531 et seq.); Marine Mammal Protection Act, as amended, (16 U.S.C. § 1361 et seq.) (taking possession, transport, purchase, sale, export or import of wildlife and plants); the Nonindigenous Aquatic Nuisance Prevention and Control Act, as amended, (16 U.S.C. § 4701 et seq.) (ensure preventive measures are taken or that probable harm of using species is minimal if there is an escape or release); and all other applicable statutes pertaining to the care, handling, and treatment of warm blooded animals held for research, teaching, or other activities supported by federal financial assistance.

11. **The Trafficking Victims Protection Act of 2000, as amended. (22 U.S.C. § 7104(g)), and the implementing regulations at 2 C.F.R. Part 175**

The Trafficking Victims Protection Act of 2000 authorizes termination of financial assistance provided to a private entity, as defined in 2 C.F.R. §175.25(d), without penalty to the federal government, if the recipient or subrecipient engages in certain activities related to trafficking in persons.

- a. Provisions applicable to a recipient that is a private entity:
 - i. You as the recipient, your employees, subrecipients under this Award, and subrecipients' employees may not—
 - a) Engage in severe forms of trafficking in persons during the period of time that this Award is in effect;
 - b) Procure a commercial sex act during the period of time that this Award is in effect; or,
 - c) Use forced labor in the performance of this Award or subawards under this Award.
 - ii. We as the federal agency may unilaterally terminate this Award, without penalty, if you or a subrecipient that is a private entity —
 - a) Is determined to have violated a prohibition in paragraph a.1 of this Section V.10; or,
 - b) Has an employee who is determined by the agency official authorized to terminate this Award to have violated a prohibition in paragraph a.1 of this Section V.10 through conduct that is either—
 - 1) Associated with performance under this Award; or,
 - 2) Imputed to you or the subrecipient using the standards and due process for imputing the conduct of an individual to an organization that are provided in 2 C.F.R. Part 180, "OMB Guidelines to Agencies on Governmentwide Debarment and Suspension (Nonprocurement)," as implemented by our agency at 31 C.F.R. Part 19.
- b. Provision applicable to a recipient other than a private entity. We as the federal agency may unilaterally terminate this Award, without penalty, if a subrecipient that is a private entity—
 - i. Is determined to have violated an applicable prohibition in paragraph a.1

of this Section V.10; or,

- ii. Has an employee who is determined by the agency official authorized to terminate this Award to have violated an applicable prohibition in paragraph (a) of this Section through conduct that is either:
 - a) Associated with performance under this Award; or,
 - b) Imputed to the subrecipient using the standards and due process for imputing the conduct of an individual to an organization that are provided in 2 C.F.R. Part 180, “OMB Guidelines to Agencies on Governmentwide Debarment and Suspension (Nonprocurement),” as implemented by our agency at 31 C.F.R. Part 19.
- c. Provisions applicable to any recipient:
 - i. You must inform us immediately of any information you receive from any source alleging a violation of a prohibition of this section.
 - ii. Our right to terminate unilaterally that is described in paragraph a.2 or b of this section:
 - a) Implements section 106(g) of the Trafficking Victims Protection Act of 2000 (TVPA), as amended (22 U.S.C. § 7104(g)), and,
 - b) Is in addition to all other remedies for noncompliance that are available to us under this Award.
 - iii. You must include the requirements of this section in any subaward you make to a private entity.
- d. *Definitions.* For purposes of this award term:
 - i. “Employee” means either:
 - a) An individual employed by you or a subrecipient who is engaged in the performance of the project or program under this Award; or,
 - b) Another person engaged in the performance of the project or program under this Award and not compensated by you including, but not limited to, a volunteer or individual whose services are contributed by a third party as an in-kind contribution toward cost sharing or matching requirements.
 - ii. “Forced labor” means labor obtained by any of the following methods: the recruitment, harboring, transportation, provision, or obtaining of a person for labor or services, through the use of force, fraud, or coercion for the purpose of subjection to involuntary servitude, peonage, debt bondage, or slavery.
 - iii. “Private entity”:
 - a) Means any entity other than a state, local government, Indian Tribe, or foreign public entity, as those terms are defined in 2 C.F.R. § 175.25.
 - b) Includes:
 - 1) A nonprofit organization, including any nonprofit institution of higher education, hospital, or tribal organization other than one included in the definition of Indian Tribe at 2 C.F.R. § 175.25(b); or,
 - 2) A for-profit organization.

- iv. “Severe forms of trafficking in persons,” “commercial sex act,” and “coercion” have the meanings given at § 103 of the TVPA, as amended (22 U.S.C. § 7102).

12. **Publications and Signage**

Any publications (written, curricula, visual, sound, reports, or websites) except scientific articles or papers appearing in scientific, technical, or professional journals or signage, produced with funds from this Award, or informing the public about the activities funded in whole or in part by this Award, must clearly display the following language:

Publications:

“This project was funded in whole or in part by a RESTORE Act [Direct Component or Centers of Excellence Research] grant, [insert grant number] awarded to [insert the Recipient’s Name] by the U.S. Department of the Treasury (Treasury). The opinions, statements, findings, conclusions, and recommendations contained herein are those of the author(s) or contributor(s) and do not necessarily represent the official position, views, or policies of Treasury. References to specific individuals, agencies, companies, products, or services should not be considered an endorsement by Treasury. Rather, the references are illustrations to supplement discussion of the issues.

The internet references cited in this publication were valid as of the date of publication. Given that URLs and websites are in constant flux, neither the author(s) nor Treasury can vouch for their current validity.”

Signage:

This project was funded by a RESTORE Act [Direct Component or Centers of Excellence Research] grant, [insert grant number] awarded to [insert the Recipient’s Name] by the U.S. Department of the Treasury.”

13. **Copyright**

If applicable, Recipient may copyright any work that is subject to copyright and was developed, or for which ownership was acquired, under this award in accordance with 2 C.F.R. § 200.315(b). The U.S. Department of the Treasury reserves a royalty-free, nonexclusive, and irrevocable license to reproduce, publish, or otherwise use the work, in whole or in part (including create derivative works), for Federal Government purposes, and to authorize others to do so. Treasury also reserves the right, at its discretion, not to publish deliverables and other materials developed under this award as a Treasury resource.

Products and deliverables developed with award funds and published as a U.S. Department of the Treasury resource will contain the following copyright notice:

“This resource was developed under a federal award and may be subject to copyright. The U.S. Department of the Treasury reserves a royalty-free, nonexclusive, and irrevocable license to reproduce, publish, or otherwise use the work for Federal Government purposes and to authorize others to do so. This resource may be freely distributed and used for noncommercial and educational purposes only.”

14. **Homeland Security Presidential Directive 12**

If the performance of this Award requires the recipient's personnel to have routine access to Treasury-controlled facilities and/or Treasury-controlled information systems (for purpose of this term "routine access" is defined as more than 180 days), such personnel must undergo the personal identity verification credential process. In the case of foreign nationals, Treasury will conduct a check with U.S. Citizenship and Immigration Services' (USCIS) Verification Division, a component of the Department of Homeland Security (DHS), to ensure the individual is in a lawful immigration status and that he or she is eligible for employment within the United States. Any items or services delivered under this Award must comply with Treasury personal identity verification procedures that implement Homeland Security Presidential Directive 12, "Policy for a Common Identification Standard for Federal Employees and Contractors", FIPS PUB 201, as amended, and OMB Memorandum M-05-24, as amended. The recipient must ensure that its subrecipients and contractors (at all tiers) performing work under this Award comply with the requirements contained in this section. Treasury may delay final payment under this Award if the subrecipient or contractor fails to comply with the requirements listed in this section. The recipient must insert the following term in all subawards and contracts when the subrecipient or contractor is required to have routine physical access to a Treasury-controlled facility or routine access to a Treasury-controlled information system:

- a. The subrecipient or contractor must comply with Treasury personal identity verification procedures identified in the subaward or contract that implement Homeland Security Presidential Directive 12 (HSPD-12), Office of Management and Budget (OMB) Guidance M-05-24, as amended, and Federal Information Processing Standards Publication, FIPS PUB 140-2, as amended, for all employees under this subaward or contract who require routine physical access to a federally controlled facility or routine access to a federally controlled information system.
- b. The subrecipient or contractor must account for all forms of government-provided identification issued to the subrecipient or contractor employees in connection with performance under this subaward or contract. The subrecipient or contractor must return such identification to the issuing agency at the earliest of any of the following, unless otherwise determined by Treasury:
 - i. When no longer needed for subaward or contract performance;
 - ii. Upon completion of the subrecipient or contractor employee's employment; or,
 - iii. Upon subaward or contract completion or termination.

15. **Export Control**

- a. This clause applies to the extent that this Award involves access to export-controlled items.
- b. In performing this financial assistance Award, the recipient may gain access to items subject to export control (export-controlled items) under the Export Administration Regulations (EAR) issued by the Department of Commerce (DOC). The recipient is responsible for compliance with all applicable laws and regulations regarding export-controlled items, including the EAR's deemed exports and re-exports provisions. The recipient shall establish and maintain effective export compliance procedures throughout performance of the Award. At a minimum, these export compliance procedures must include adequate controls of physical, verbal, visual, and electronic access to export-controlled items, including by foreign nationals.
- c. Definitions:
 - i. Export-controlled items. Items (commodities, software, or technology), that are subject to the EAR (15 C.F.R. §§ 730–774), implemented by the

DOC's Bureau of Industry and Security. These are generally known as "dual-use" items, items with a military and commercial application.

- ii. Deemed Export/Re-export. The EAR defines a deemed export as a release of export-controlled items (specifically, technology or source code) to a foreign national in the U.S. Such release is "deemed" to be an export to the home country of the foreign national. 15 C.F.R. § 734.2(b)(2)(ii). A release may take the form of visual inspection, oral exchange of information, or the application abroad of knowledge or technical experience acquired in the United States. If such a release occurs abroad, it is considered a deemed re-export to the foreign national's home country. Licenses from DOC may be required for deemed exports or re-exports.
- d. The recipient shall control access to all export-controlled items that it possesses or that comes into its possession in performance of this Award, to ensure that access to, or release of, such items are restricted, or licensed, as required by applicable federal statutes, EOs, and/or regulations, including the EAR.
- e. To the extent the recipient wishes to provide foreign nationals with access to export-controlled items, the recipient shall be responsible for obtaining any necessary licenses, including licenses required under the EAR for deemed exports or deemed re-exports.
- f. Nothing in the terms of this Award is intended to change, supersede, or waive the requirements of applicable federal statutes, EOs, and/or regulations.
- g. Compliance with this section will not satisfy any legal obligations the recipient may have regarding items that may be subject to export controls administered by other agencies such as the Department of State, which has jurisdiction over exports of munitions items subject to the International Traffic in Arms Regulations (ITAR) (22 C.F.R. § 120–130), including releases of such items to foreign nationals.
- h. The recipient shall include this clause, including this paragraph (i), in all lower-tie transactions (subawards, contracts, and subcontracts) under this Award that may involve access to export-controlled items.

APPENDIX I: 2 C.F.R. PART 170, APPENDIX A

I. Reporting Subawards and Executive Compensation

(a) Reporting of first-tier subawards —

(1) Applicability. Unless the recipient is exempt as provided in paragraph (d) of this award term, the recipient must report each subaward that equals or exceeds \$30,000 in Federal funds for a subaward to an entity or Federal agency. The recipient must also report a subaward if a modification increases the Federal funding to an amount that equals or exceeds \$30,000. All reported subawards should reflect the total amount of the subaward.

(2) Reporting Requirements. (i) The entity or Federal agency must report each subaward described in paragraph (a)(1) of this award term to the Federal Funding Accountability and Transparency Act Subaward Reporting System (FSRS) at <http://www.fsrs.gov>.

(ii) For subaward information, report no later than the end of the month following the month in which the subaward was issued. (For example, if the subaward was made on November 7, 2025, the subaward must be reported by no later than December 31, 2025).

(b) Reporting total compensation of recipient executives for entities —(1) Applicability. The recipient must report the total compensation for each of the recipient's five most highly compensated executives for the preceding completed fiscal year if:

(i) The total Federal funding authorized to date under this Federal award equals or exceeds \$30,000;

(ii) in the preceding fiscal year, the recipient received:

(A) 80 percent or more of the recipient's annual gross revenues from Federal procurement contracts (and subcontracts) and Federal awards (and subawards) subject to the Transparency Act; and

(B) \$25,000,000 or more in annual gross revenues from Federal procurement contracts (and subcontracts) and Federal awards (and subawards) subject to the Transparency Act; and,

(iii) The public does not have access to information about the compensation of the executives through periodic reports filed under section 13(a) or 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. 78m(a), 78o(d)) or section 6104 of the Internal Revenue Code of 1986 after receiving this subaward. (To determine if the public has access to the compensation information, see the U.S. Security and Exchange Commission total compensation filings at <http://www.sec.gov/answers/execomp.htm>).

(2) Reporting Requirements. The recipient must report executive total compensation described in paragraph (b)(1) of this appendix:

(i) As part of the recipient's registration profile at <https://www.sam.gov>.

(ii) No later than the month following the month in which this Federal award is made, and annually after that. (For example, if this Federal award was made on November 7, 2025, the executive total compensation must be reported by no later than December 31, 2025.)

(c) Reporting of total compensation of subrecipient executives— (1) Applicability. Unless a first-tier subrecipient is exempt as provided in paragraph (d) of this appendix, the recipient must report the executive total compensation of each of the subrecipient's five most highly compensated executives for the subrecipient's preceding completed fiscal year, if:

(i) The total Federal funding authorized to date under the subaward equals or exceeds \$30,000;

(ii) In the subrecipient's preceding fiscal year, the subrecipient received:

(A) 80 percent or more of its annual gross revenues from Federal procurement contracts (and subcontracts) and Federal awards (and subawards) subject to the Transparency Act; and,

(B) \$25,000,000 or more in annual gross revenues from Federal procurement contracts (and subcontracts), and Federal awards (and subawards) subject to the Transparency Act; and

(iii) The public does not have access to information about the compensation of the executives through periodic reports filed under section 13(a) or 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. 78m(a), 78o(d)) or section 6104 of the Internal Revenue Code of 1986 after receiving this subaward. (To determine if the public has access to the compensation information, see the U.S. Security and Exchange Commission total compensation filings at <http://www.sec.gov/answers/excomp.htm>).

(2) Reporting Requirements. Subrecipients must report to the recipient their executive total compensation described in paragraph (c)(1) of this appendix. The recipient is required to submit this information to the Federal Funding Accountability and Transparency Act Subaward Reporting System (FSRS) at <http://www.fsrs.gov> no later than the end of the month following the month in which the subaward was made. (For example, if the subaward was made on November 7, 2025, the subaward must be reported by no later than December 31, 2025).

(d) Exemptions. (1) A recipient with gross income under \$300,000 in the previous tax year is exempt from the requirements to report:

(i) Subawards, and

(ii) The total compensation of the five most highly compensated executives of any subrecipient.

(e) Definitions.

For purposes of this award term:

Entity includes:

(1) Whether for profit or nonprofit:

(i) A corporation;

(ii) An association;

(iii) A partnership;

(iv) A limited liability company;

(v) A limited liability partnership;

(vi) A sole proprietorship;

(vii) Any other legal business entity;

(viii) Another grantee or contractor that is not excluded by subparagraph (2); and

(ix) Any State or locality;

(2) Does not include:

(i) An individual recipient of Federal financial assistance; or

(ii) A Federal employee.

Executive means an officer, managing partner, or any other employee holding a management position.

Subaward has the meaning given in 2 C.F.R. 200.1.

Subrecipient has the meaning given in 2 C.F.R. 200.1.

Total Compensation means the cash and noncash dollar value an executive earns during an entity's preceding fiscal year. This includes all items of compensation as prescribed in 17 C.F.R. 229.402(c)(2).

APPENDIX II: 2 C.F.R. PART 25, APPENDIX A

A. Requirement for System for Award Management

Unless recipients are exempted from this requirement under [2 C.F.R. 25.110](#), the recipient must maintain current information in the SAM. This includes information on the recipient's immediate and highest level owner and subsidiaries, as well as on all of the recipient's predecessors that have been awarded a Federal contract or Federal financial assistance within the last three years, if applicable, until the recipient submits the final financial report required under this Federal award or receive the final payment, whichever is later. This requires that the recipient review and update the information at least annually after the initial registration, and more frequently if required by changes in the recipient's information or another Federal award term.

B. Requirement for Unique Entity Identifier

If recipients are authorized to make subawards under this Federal award, recipients:

1. Must notify potential subrecipients that no entity (see definition in paragraph C of this award term) may receive a subaward from the recipient until the entity has provided its Unique Entity Identifier to the recipient.
2. May not make a subaward to an entity unless the entity has provided its Unique Entity Identifier to the recipient. Subrecipients are not required to obtain an active SAM registration, but must obtain a Unique Entity Identifier.

C. Definitions

For purposes of this term:

1. System for Award Management (SAM) means the Federal repository into which a recipient must provide information required for the conduct of business as a recipient. Additional information about registration procedures may be found at the SAM internet site (currently at <https://www.sam.gov/>).
2. Unique Entity Identifier means the identifier assigned by SAM to uniquely identify business entities.
3. Entity includes non-Federal entities as defined at [2 C.F.R. 200.1](#) and also includes all of the following, for purposes of this part:
 - a. A foreign organization;
 - b. A foreign public entity;
 - c. A domestic for-profit organization; and
 - d. A Federal agency.
4. Subaward has the meaning given in [2 C.F.R. 200.1](#).
5. Subrecipient has the meaning given in [2 C.F.R. 200.1](#).

APPENDIX III: DAVIS-BACON AND RELATED ACTS REQUIREMENTS

1. Minimum wages.

(i) All laborers and mechanics employed or working upon the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act ([29 C.F.R. part 3](#))), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 C.F.R. § 5.5(a)(1)(iv); also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in [§ 5.5\(a\)\(4\)](#). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under [paragraph \(a\)\(1\)\(ii\)](#) of 29 C.F.R. § 5.1 and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

(ii)

(A) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

- (1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and
- (2) The classification is utilized in the area by the construction industry; and
- (3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the

contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to [paragraphs \(a\)\(1\)\(ii\) \(B\) or \(C\)](#) of 29 C.F.R. . § 5.5, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding.

The Department of Treasury or recipient shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), all or part of the wages required by the contract, Treasury or the recipient may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and basic records.

(i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work (or under the United States Housing Act of 1937, or under the Housing Act of 1949, in the construction or development of the project). Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under [29 C.F.R. 5.5\(a\)\(1\)\(iv\)](#) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii)

(A) The contractor shall submit weekly for each week in which any contract work is performed a copy

of all payrolls to the recipient. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under [29 C.F.R. 5.5\(a\)\(3\)\(i\)](#), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <https://www.dol.gov/agencies/whd/government-contracts/construction/payroll-certification> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the recipient, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of 29 C.F.R. § 5.5 for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the sponsoring government agency (or the applicant, sponsor, or owner).

(B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under [§ 5.5 \(a\)\(3\)\(ii\)](#) of Regulations, [29 C.F.R. part 5](#), the appropriate information is being maintained under [§ 5.5 \(a\)\(3\)\(i\)](#) of Regulations, [29 C.F.R. part 5](#), and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, [29 C.F.R. part 3](#);

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by [paragraph \(a\)\(3\)\(ii\)\(B\)](#) of this 29 C.F.R. . § 5.5.

(D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under [paragraph \(a\)\(3\)\(i\)](#) of 29 C.F.R. § 5.5 available for inspection, copying, or transcription by authorized representatives of the recipient, Department of Treasury, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to [29 C.F.R. 5.12](#).

4. Apprentices and trainees -

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they 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, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, 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 Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in [29 C.F.R. 5.16](#), trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and [29 C.F.R. part 30](#).

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of [29 C.F.R. part 3](#), which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses contained in [29](#)

[C.F.R. 5.5\(a\)\(1\)](#) through [\(10\)](#), and also a clause requiring the subcontractors to include these clauses in any lower-tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower-tier subcontractor with all the contract clauses in [29 C.F.R. 5.5](#).

7. Contract termination: debarment. A breach of the contract clauses in [29 C.F.R. 5.5](#) may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in [29 C.F.R. 5.12](#).

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in [29 C.F.R. parts 1, 3, and 5](#) are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in [29 C.F.R. parts 5, 6, and 7](#). Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

(i) By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or [29 C.F.R. 5.12\(a\)\(1\)](#).

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or [29 C.F.R. 5.12\(a\)\(1\)](#).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, [18 U.S.C. 1001](#).

APPENDIX IV: CONTRACT CLAUSES REQUIRED FOR CONTRACTS SUBJECT TO THE REQUIREMENTS OF THE CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph 1 of 29 C.F.R. § 5.5(b), the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph 1 of 29 C.F.R. § 5.5(b), in the sum of \$27 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph 1 of 29 C.F.R. § 5.5(b).

(3) Withholding for unpaid wages and liquidated damages. The Department of Treasury or recipient shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 2 of 29 C.F.R. § 5.5(b).

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph 1 through 4 of 29 C.F.R. § 5.5(b) and also a clause requiring the subcontractors to include these clauses in any lower-tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower-tier subcontractor with the clauses set forth in paragraph 1 through 4 of 29 C.F.R. § 5.5(b).

APPENDIX V: 41 C.F.R. § 60-1.4

During the performance of this contract, the contractor agrees as follows:

- 1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:

Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
- 2) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
- 3) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.
- 4) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- 5) The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- 6) The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- 7) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

- 8) The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance:

Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

The [recipient] further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: Provided, That if the [recipient] so participating is a State or local government, the above equal opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract.

The [recipient] agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance.

The [recipient] further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the [recipient] agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

EXHIBIT C: TECHNICAL SPECIFICATIONS



Yesenia Singleton
12/22/2023

SECTION 011100 SUMMARY OF WORK

PART 1 GENERAL

1.1 SUMMARY

- A. The scope of work for **MARISOL BOAT RAMP PROJECT (2025-SL01)** consists of clearing & grubbing, removal and disposal of a section of existing bulkhead and pavement section to allow for construction of proposed boat ramp and adjacent bulkhead, reinforced concrete pavement and paver parking stalls, header curbs, pavement striping, ADA ramp and parking stall, attendant boat dock, and fish cleaning station improvements, as well as installation of water, wastewater, landscape, and electrical utilities. All work shall be completed in accordance with the construction plans, specifications, and contract documents.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification: **Marisol Boat Ramp Project (2025-SL01)**
- B. Owner:
City of South Padre Island
4601 Padre Blvd
South Padre Island, TX 78597
- C. Engineer:
LJA Engineering, Inc.
5350 S. Staples St., Ste. 425
Corpus Christi, TX 78411
Contact: Yesenia Singleton, PE
T: 361-991-8550
Email: ysingleton@lja.com

1.3 TYPE OF CONTRACT

- A. Reference Owner for General, Supplementary and Special Conditions, and Proposal, Bonding, Insurance and Contracting Requirements.

1.4 QUALITY ASSURANCE RESPONSIBILITIES TO BE PROVIDED BY CONTRACTOR

- A. Keep at the project site, during the period when work is being installed, an Owner approved competent superintendent/working foreman who is qualified to direct technical and logistical aspects of the project.
- B. The approved working foreman shall not be removed from the project without prior approval from Owner. If removal is for acceptable cause, Contractor shall submit justification in writing within 48 hours prior to the removal. A new foreman will be onsite prior to removal of existing foreman to ensure work will not cease and continuity of work is maintained.
- C. Work is to be installed by skilled workers with a minimum of five (5) years of experience doing work of similar scope and detail. Provide documentation of experience to the Owner.
- D. Work is to be done in accordance with contract documents and drawings. Deviation from such will be at the discretion of the Engineer and Owner, and will be authorized in writing.
- E. Exercise caution in installing the work so as not to damage adjacent building elements and existing site improvements not in the scope of work. Be responsible to protect the adjacent materials from damage due to work or scaffolding, other materials, and equipment.
- F. If adjacent elements are damaged due to Contractor's work process during the execution of the work, the Contractor shall be responsible for repairing or replacing the damaged units at no additional cost to the Owner and to the Engineer and Owner's satisfaction.
- G. Material and field testing will be required and shall be provided by the Owner, as specified in Section 014529 Testing Laboratory Services, and will require coordination by the Contractor.

1.5 PROJECT CONDITIONS

- A. Survey of Existing Condition
 - 1. Contractor is to survey the property and document existing conditions prior to commencing work. Contractor is to physically and visually inspect and video document the existing condition of areas such as landscaping, irrigation system, pavement, auxiliary structures not included in the scope of work and other items on the property not included in the scope of work. All significant conditions as determined by the Contractor and Owner are also to be documented in writing. All video and written documentation is to be provided to Owner's Representative prior to commencing work.
- B. Existing Underground Utilities
 - 1. It is the General Contractor's responsibility to locate all underground utilities, including storm sewer system lines, wastewater lines, irrigation lines, etc., prior to mobilization and commencement of Work. Contact all utility providers as required to located underground utilities. Any costs to repair damages if utilities are not properly identified, are the sole responsibility of the Contractor.

1.6 USE OF PREMISES & WORK HOURS

- A. General: Contractor shall have limited use of premises for construction operations as indicated on Drawings and by the Contract limits.

- B. Use of Site: Limit use of premises to the project site and areas indicated by the Owner. Do not disturb portions of Project site beyond areas in which the Work is indicated.
 - 1. Limits: Confine construction operations to areas designated by the Owner.
 - 2. Access ways: Keep access ways serving the premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - 3. Owner needs to maintain full use of the facility. Coordinate site access requirements with Owner.
 - 4. Equipment access to be scheduled with Owner's representative forty-eight (48) hours in advance.
- C. Contractor shall limit use of the premises for work to 7:00 AM - 7:00 PM, Monday-Sunday, except as designated by Owner, to allow for the continuous operation of the facilities.
- D. Coordinate use of premises under direction of the Owner. This includes on-site storage of materials and equipment. Limited on-site storage is available at the site and is subject to coordination with and authorization by the Owner.
- E. Contractor shall assume full responsibility for the protection and safekeeping of products stored on premises, and for their proper use.

1.7 OWNER'S OCCUPANCY REQUIREMENTS

- A. Full Owner Occupancy: Personnel will continuously occupy and access the adjacent buildings and grounds. Perform the Work so as not to interfere with day-to-day operations.
 - 1. Provide not less than seventy-two (72) hours notice to Owner of activities that will affect Owner's operations.

1.8 WORK RESTRICTIONS

- A. Existing Utility Interruptions: Do not interrupt utilities serving the adjacent buildings without written authorization from Owner.

1.9 JOB CONDITIONS

- A. Confine operations at site to areas permitted by laws, permits, contract, and the Owner.
- B. Access shall be provided for random observation of work in progress.

1.10 PROJECT SCHEDULE

- A. Time of completion of the proposed Contract is of importance to the Owner. Costs caused by ill-timed or defective work, or work not conforming to the contract documents, are the responsibility of the Contractor.

1.11 FIELD MEASUREMENTS

- A. Verify the accuracy of drawings, dimensions, locations, and site conditions relating to existing or other work. Errors due to failure to verify such information shall be promptly rectified without additional cost to the Owner.

1.12 SITE CLEANUP

- A. Execute cleanup to ensure that the buildings, grounds, and adjacent sites are maintained free of waste, debris, and rubbish. Remove waste materials from site on a daily basis.
- B. Handle materials in a controlled, responsible manner.
- C. Any landscaping, including soft and hard landscape elements, irrigation systems, etc., damaged during construction shall be restored to its original condition at no additional cost to the Owner.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 012000

PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Schedule of Values.
 - 2. Applications for Payment.

1.2 SCHEDULE OF VALUES

- A. General:
 - 1. Submit a Schedule of Values to Project Engineer at least 20 days prior to submitting first Application for Payment.
 - 2. Schedule of Values is a required submittal and must be approved prior to review of Applications for Payment.
 - 3. Upon request of Engineer, furnish additional data to support values given that will substantiate their correctness.
 - 4. Approved Schedule of Values will be used as basis for reviewing Contractor's Applications for Payment.
- B. Form and Content:
 - 1. Format: Contractor's standard electronic media printout will be considered.
 - 2. List installed value of component parts of Work in sufficient detail to serve as basis for computing values for progress payments.
 - 3. Include separate line items for:
 - a. Site mobilization.
 - b. Insurance.
 - c. Contractor's general conditions such as scaffolding, overhead and profit.
 - d. Demolition equipment and labor
 - e. Disposal Costs
 - 4. For items on which payment will be requested for stored materials, break down value into:
 - a. Cost of materials, delivered and unloaded.
 - b. Total installed value.
 - 5. For each line item that has a value of more than \$25,000.00, break down costs to list major products or operations under each item.
 - 6. Total of costs listed in Schedule shall equal Contract Sum.
- C. Review and Resubmittal:
 - 1. After initial review by Project Engineer, revise and resubmit if required.
 - 2. Schedule revision: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.3 APPLICATIONS FOR PAYMENT

A. Preparation:

1. Format: AIA Document G702 - Application and Certification for Payment, supported by AIA Document G703 - Continuation Sheet. Contractor's standard electronic media printout will be considered.
2. Prepare required information in typewritten format or on electronic media printout.
3. Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Project Manager will return incomplete applications without action.
 - a. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
 - b. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
4. Use data from reviewed Schedule of Values. Provide dollar value in each column for each line item representing portion of work performed.
5. List each authorized Change Order as a separate line item, listing Change Order number and dollar value.
6. Prepare Application for Final Payment as specified in Section 017700.

B. Waivers of Lien:

1. Along with the each Application for Payment, submit waivers of lien from each Subcontractor or Sub-subcontractor included on the current month's Application for Payment.
2. Submit partial waivers on each item for amount requested, prior to deduction of retainage.
3. For completed items, submit full or final waiver.

C. Substantiating Data:

1. When Project Manager or Engineer requires substantiating information, submit data justifying dollar amounts in question.
2. Provide one copy of data with cover letter showing Application number and date, and line item number and description.

D. Submittal:

1. Submit 3 signed and notarized original copies of each Application for Payment to Project Manager by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
 - a. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
2. Payment period: Submit at intervals stipulated in Agreement.

- E. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. Schedule of Values.
 3. Contractor's Construction Schedule (preliminary if not final).
 4. Schedule of unit prices.
 5. Submittals Schedule (preliminary if not final).
 6. List of Contractor's staff assignments.
 7. List of Contractor's principal consultants.
 8. Copies of building permits.
 9. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 10. Initial progress report.
 11. Report of preconstruction conference.
 12. Certificates of insurance and insurance policies.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 012100

ALLOWANCES

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements governing allowances.
 - 1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. If necessary, additional requirements will be issued by Change Order.
- B. Types of allowances include the following:
 - 1. Contingency allowances.

1.2 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Engineer of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
- B. At Engineer's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Engineer from the designated supplier.

1.3 SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.
- B. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.4 COORDINATION

- A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.5 CONTINGENCY ALLOWANCES

- A. Use the contingency allowance only as directed by Engineer for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.
- B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract

Sum. These costs include delivery, installation, taxes, insurance, equipment rental, and similar costs.

- C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit margins.
- D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

PART 2 PRODUCTS

(NOT USED) PART 3

EXECUTION

3.1 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

- A. Allowance No. 1: Owner's Contingency = \$100,000.00

END OF SECTION

SECTION 012500

SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - ~~1. Document 002600 "Procurement Substitution Procedures" for requirements for substitution requests prior to award of Contract.~~
 - 2. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.2 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.3 ACTION SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use form acceptable to Architect.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
 - b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size,

durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.

- d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES
 - j. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.4 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.5 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

1.6 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Substitution request is fully documented and properly submitted.
 - c. Requested substitution will not adversely affect Contractor's construction schedule.
 - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - e. Requested substitution is compatible with other portions of the Work.
 - f. Requested substitution has been coordinated with other portions of the Work.
 - g. Requested substitution provides specified warranty.
 - h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- B. Substitutions for Convenience: Architect will consider requests for substitution if received within 60 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.
1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
 - b. Requested substitution does not require extensive revisions to the Contract Documents.
 - c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - d. Substitution request is fully documented and properly submitted.
 - e. Requested substitution will not adversely affect Contractor's construction schedule.
 - f. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - g. Requested substitution is compatible with other portions of the Work.
 - h. Requested substitution has been coordinated with other portions of the Work.
 - i. Requested substitution provides specified warranty.

- j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 013119

PROJECT MEETINGS

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes scheduling and administering progress meetings, and providing minutes of meetings.

1.2 PRECONSTRUCTION MEETING

- A. Schedule within ten (10) days after Date of Notice to Proceed and prior to starting the project.
- B. Attendance: Contractor, Subcontractors, Engineer, and Owner's representative.
- C. Agenda to Include:
 - 1. Safety and first aid procedures.
 - 2. Construction schedule.
 - 3. Relation and coordination of Subcontractors.
 - 4. Designation of responsible personnel.
 - 5. Processing of field decisions and change orders.
 - 6. Submittal of shop drawings, project data, and samples.
 - 7. Procedures for maintaining record documents.
 - 8. Use of premises.
 - 9. Major equipment deliveries and priorities.
 - 10. Security procedures.
 - 11. Housekeeping procedures.
 - 12. Setting progress meeting intervals and schedules.

1.3 PROGRESS MEETINGS

- A. Hold regular meetings at intervals agreed upon at Preconstruction Meeting.
- B. Attendance: Contractor, Subcontractors as pertinent to agenda, Engineer, and Owner's Representatives.
- C. Minimum Agenda (to be developed by Contractor for each meeting):
 - 1. Review work progress since last meeting.
 - 2. Note field observations, problems, and decisions.
 - 3. Identify problems that impede planned progress.
 - 4. Review supplier problems.
 - 5. Develop corrective measures and procedures to regain schedule.
 - 6. Coordinate projected progress with building use needs.
 - 7. Review submittal schedules; expedite as required to maintain schedule.
- D. Contractor shall take Meeting Minutes during progress meetings and issue them to Engineer and Owner's Representatives no later than one (1) week after meeting.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 013200

CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Contractor's Construction Schedule.
 - 2. Submittals Schedule.
 - 3. Daily Construction Reports.
 - 4. Field Condition Reports.

1.2 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
 - 1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.
- B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.
- C. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration.

1.3 SUBMITTALS

- A. Submittals Schedule: Submit four copies of schedule. Arrange the following information in a tabular format:
 - 1. Scheduled date for submittals.
 - 2. Specification Section number and title.
 - 3. Submittal category (action or informational).
 - 4. Name of Subcontractor.
 - 5. Description of the Work covered.
 - 6. Scheduled date for final release or approval.
- B. Preliminary Network Diagram: Submit four copies, large enough to show entire network for entire construction period. Show logic ties for activities.
- C. Contractor's Construction Schedule: Submit four copies of initial schedule, large enough to show entire schedule for entire construction period.

- D. Daily Construction Reports: Submit four copies at weekly intervals.
- E. Field Condition Reports: Submit four copies at time of discovery of differing conditions.

1.4 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from parties involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 PRODUCTS

2.1 SUBMITTALS SCHEDULE

- A. Must be submitted and approved within two weeks of Notice to Proceed.
- B. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.
 - 1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
 - 2. Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Timeframe: Extend schedule from date established for the Notice to Proceed to date of Final Completion.
 - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. Activities: Treat each separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
 - 1. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than sixty days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
 - 2. Schedule shall include Application for Payment dates.
 - 3. Submittal Review Time: Include review and resubmittal times indicated in Section 01330 - "Submittal Procedures," in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
 - 4. Startup Time: Include time for startup.

5. Substantial Completion: Indicate completion in advance of date established for substantial completion, and allow time for administrative procedures necessary for certification of substantial completion.
- C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
1. Phasing: Arrange list of activities on schedule by phase.
 2. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Uninterruptible services.
 - c. Use of premises restrictions.
 - d. Seasonal variations.
 - e. Environmental control.
 3. Work Stages: Indicate important stages of construction for each major portion of the Work.
 4. Milestones: Include milestones indicated in the Contract Documents in schedule including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.
- D. Contract Modifications: For each proposed contract modification, and concurrent with its submission, prepare a time-impact analysis to demonstrate the effect of the proposed change on the overall project schedule.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Construction Schedule: Submit a comprehensive, fully developed construction schedule at the Preconstruction Meeting. Base schedule on the Preliminary Construction Schedule and whatever updating and feedback was received since the start of Project.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

2.4 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
1. List of Subcontractors at Project site.
 2. Equipment at Project site.
 3. Material deliveries.
 4. High and low temperatures and general weather conditions.
 5. Accidents.
 6. Stoppages, delays, shortages, and losses.
 7. Orders and requests of authorities having jurisdiction.
 8. Services connected and disconnected.
 9. Equipment or system tests and startups.
 10. Work completed.
- B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report.

Describe the differing conditions and recommendation for changing Contract Documents.

PART 3 EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule Updating: At bi-weekly intervals, update schedule to reflect actual construction progress and activities. Distribute schedule one week before each regularly scheduled progress meeting.
 - 1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 - 2. Include a report with updated schedule that indicates every change including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 - 3. As the work progresses, indicate actual completion percentage for each activity.
- B. Updated Construction Schedule must be submitted with Periodic Pay Applications or Owner has no obligation to approve payments.
- C. Distribution: Distribute copies of approved schedule to Engineer and Owner, other parties identified by Contractor with a need-to-know schedule responsibility.

END OF SECTION

SECTION 013300

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. See Section 013200 - Construction Progress Documentation for submitting schedules and reports, including Contractor's Construction Schedule.
- C. See Section 014500 - Project Quality Controls and Procedures for submitting test and inspection reports and for mock-up requirements.
- D. See Section 017700 - Closeout Procedures for submitting close out documents.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information that requires Engineer's responsive action.
- B. Informational Submittals: Written information that does not require Engineer's responsive action. Submittals may be rejected for not complying with requirements.

1.3 SUBMITTAL PROCEDURES

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- B. Submittals Schedule: Comply with requirements in Section 013200 -Construction Progress Documentation for list of submittals and time requirements for scheduled performance of related construction activities.
- C. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer's receipt of hardcopy submittal. Complete electronic (PDF) copies will be accepted; electronic submittals shall one (1) file with all required information in sequence for review. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow 14 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 3. Resubmittal Review: Allow 14 days for review of each resubmittal.
- D. Identification: Place a permanent label or title block on each submittal for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
 2. Provide a space on label or beside title block to record Contractor's review and approval markings and action taken by Engineer.
 3. Include the following information on label for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name and address of Engineer.
 - d. Name and address of Contractor.
 - e. Name and address of subcontractor.
 - f. Name and address of supplier.
 - g. Name of manufacturer.
 - h. Submittal number or other unique identifier, including revision identifier.
 - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 06100.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 06100.01.A).
 - i. Number and title of appropriate Specification Section.
 - j. Drawing number and detail references, as appropriate.
 - k. Location(s) where product is to be installed, as appropriate.
 - l. Other necessary identification.
- E. Deviations: Highlight, encircle, or otherwise specifically identify deviations from the Contract Documents on submittals.
- F. Additional Copies: Unless additional copies are required for final submittal, and unless Engineer observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
1. Additional copies submitted for maintenance manuals will not be marked with action taken and will be returned.
- G. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Engineer will discard submittals received from sources other than Contractor.
- H. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
1. Note date and content of previous submittal.
 2. Note date and content of revision in label or title block and clearly indicate extent of revision.

3. Resubmit submittals until they are approved by the Engineer.
- I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- J. Use for Construction: Use only final Engineer approved submittals.

PART 2 PRODUCTS

2.1 SUBMITTALS

- A. General: Prepare and submit Submittals required by individual Specification Sections.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
 2. Mark each copy of each submittal to show which products and options are applicable.
 3. Include the following information, as applicable:
 - a. Manufacturer's written recommendations.
 - b. Manufacturer's product specifications.
 - c. Manufacturer's installation instructions.
 - d. Manufacturer's catalog cuts.
 - e. Wiring diagrams showing factory-installed wiring.
 - f. Printed performance curves.
 - g. Operational range diagrams.
 - h. Compliance with specified referenced standards.
 - i. Testing by recognized testing agency.
 4. Number of Copies: Electronic (PDF) copies are preferred. If hard copy submittals are required, submit four (4) copies of Product Data, unless otherwise indicated. Engineer will return two (2) copies. Mark-up and retain one returned copy as a Project Record Document.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Fabrication and installation drawings.
 - c. Roughing-in and setting diagrams.
 - d. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
 - e. Shopwork manufacturing instructions.
 - f. Templates and patterns.
 - g. Schedules.
 - h. Notation of coordination requirements.
 - i. Notation of dimensions established by field measurement.

- j. Relationship to adjoining construction clearly indicated.
 - k. Seal and signature of professional engineer if specified.
 - l. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
- 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 24 by 36 inches.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
 - 1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 - 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of appropriate Specification Section.
 - 3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - 4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit one full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Engineer will return submittal with options selected.
 - 5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - a. Number of Samples: Submit three sets of Samples. Engineer will retain two Sample sets; remainder will be returned.
- E. Product Schedule or List: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location.
 - 1. Number of Copies: Electronic (PDF) copies are preferred. If hard copy submittals are required, submit four (4) copies of Product Data, unless otherwise indicated. Engineer will return two (2) copies. Engineer will return three (3) copies.
- F. Submittals Schedule: Comply with requirements specified in Division 1 Section "Construction Progress Documentation."

- G. Application for Payment: Comply with requirements specified in Division 1 Section “Payment Procedures.”
- H. Schedule of Values: Comply with requirements specified in Division 1 Section “Payment Procedures.”
- I. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1. Number of Copies: Electronic (PDF) copies are preferred. If hard copy submittals are required, submit four (4) copies of Product Data, unless otherwise indicated. Engineer will return two (2) copies. Engineer will return three (3) copies.

2.2 DELEGATED DESIGN

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Engineer.
- B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit three copies of a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
 - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 EXECUTION

3.1 CONTRACTOR’S REVIEW

- A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.
- B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor’s approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.
- C. Submittal Log: maintain a submittal log that lists all submitted items per specification section. Record the dates submitted, the dates returned, and disposition of each item based on the Engineer’s review. Submit final log showing all approved materials at substantial completion.

3.2 ENGINEER'S ACTION

- A. General: Engineer will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. The Engineer will review, with reasonable promptness, all submitted documents and samples only for conformance with the design concept of the project and compliance with the information given in the Contract Documents. The Engineer will respond to Requests for Information (RFI's) within five working days from receipt and Submittals within 14 working days from receipt.
- C. Submittals returned by the Engineer marked "Reviewed As Noted" shall be revised by the Contractor to verify all noted items are properly addressed and corrected prior to construction. The revised submittal does not need to be resubmitted but shall be retained by the Contractor for their records.
- D. Submittals returned by the Engineer marked "Revise and Resubmit" shall be revised by the Contractor by addressing and correcting all noted items. The revised submittal shall be resubmitted to the Engineer for further review.

END OF SECTION

SECTION 013523

PROJECT SAFETY REQUIREMENTS

PART 1 GENERAL

1.1 SAFETY REQUIREMENTS

A. Safety Standards

1. Safety of persons including workers, building tenants, and innocent bystanders shall be of the highest concern. When work cannot proceed safely because of inclement weather (such as high winds), broken or damaged equipment, or for any other reason, work shall be stopped, left in the safest possible condition, and not resumed until the unsafe conditions have ceased or been corrected. The authoritative standards for all work shall be OSHA, the Environmental Protection Agency, Texas Department of Health and Human Services, or the prevailing Local standards and regulations, whichever is more stringent. Safety requirements mandated under this contract must comply with, but are not limited to, the specific measures noted in this section. The Contractor shall comply with all safety and health requirements of OSHA, EPA, and other Federal, State, or Local authorities, whether or not specifically noted herein.
2. Prior to commencement of project, the Contractor shall meet with representatives from the Cameron County Parks & Recreation Department to review additional requirements.

B. No Compromise of Independent Contractor Status

1. Nothing in this section shall be construed to alter or compromise the status of the Contractor as an "Independent Contractor" as defined by the rules and regulations of the Internal Revenue Service or the Texas Workers' Compensation Act of 1989.

C. Safety is Responsibility of Contractor

1. Nothing in this section shall render the Owner or the Engineer responsible or liable for acts or omissions of the Contractor in complying with the safety provisions of this section of the specifications. Nothing in this section shall render the Owner, or Engineer responsible for inspections, observations, or reports to ensure compliance with these safety provisions, nor shall the Owner or Engineer be responsible for correcting safety violations or deficiencies in the Contractor's operations. Compliance with all safety provisions is the responsibility of the Contractor, and all procedures suggested herein are strictly advisory.

D. Breach of Contract

1. Failure to comply with these safety regulations and requirements shall, however, constitute breach of this contract by the Contractor. The express intent of this section is to encourage jobsite safety.

E. Safety of Building Occupants and Innocent Bystanders

1. All work shall be conducted in such a way as to ensure protection for building occupants and innocent passers-by or bystanders. Ground equipment and storage areas shall be protected by fencing if dangerous or harmful equipment is to be employed. Warning signs shall be posted to notify all individuals of the work in progress. Cars and vehicles

of subject individuals shall be protected by timely notification to move vehicles or other practical means.

1.2 DOCUMENTATION

A. OSHA Records

1. The safety standards to be followed at all times are those established by OSHA for jobsite work practices. OSHA injury records and logs are to be maintained at the jobsite at all times.

B. Accident Records and Logs

1. A record shall be kept of all accidents or injuries and the Owner and Engineer shall be notified of any injury or accident causing a worker to miss more than one full day of work

C. Emergency Phone Numbers

1. The Contractor shall provide an emergency phone number where an officer of the company can be reached 24 hours a day in the event of an emergency.

1.3 EMPLOYEE SAFETY TRAINING

A. Contractor Safety Officer

1. The contractor shall designate his Superintendent, Foreman, or other person who will be on the job full-time as the Contractor Safety Officer. The Safety Officer will be responsible for following accepted safe work standards at all times. He will dismiss from the jobsite any employee improperly dressed or failing consistently to follow safe work practices.

B. Safety Meetings

1. Prior to commencement of work, a "Toolbox Talk" safety meeting will be held at the jobsite by the Contractor Safety Officer to relate specific jobsite field conditions to be addressed and procedures to be followed. This section of the specifications shall be read aloud to all employees and each employee shall be given a copy to read. After each injury, should such occur, the Contractor shall stop work, conduct a "Toolbox Talk" with all on-site personnel regarding the injury, what happened, how it happened, and what should have been done to prevent the accident or injury.

C. Alcohol and Drugs

1. No alcohol or drugs shall be permitted on the jobsite or in Contractor vehicles on the premises. Should any Contractor personnel be found to be under the influence of alcohol or any controlled substance including, but not limited to, drugs or inhalants, the employee shall be transported safely from the jobsite by an unimpaired employee or representative of the Contractor and that employee shall not be permitted to work on the project again. "In accordance with Article 7.10 (a) of the Texas Workers' Compensation Act of 1989, "Each employer who has 15 or more employees and who maintains workers' compensation coverage shall adopt a policy designed to eliminate drug abuse and its effects in the workplace.

D. Hazardous and Toxic Material Warning

1. Employees shall be warned of the presence or use of any and all toxic or hazardous materials as defined by the Environmental Protection Agency. All such materials shall be

strictly handled and disposed of in accordance with Federal, State, and Local Laws and Regulations, whichever is the most stringent. MSDS sheets shall be provided for all chemicals. In addition Resource Reclamation and Recovery Act (RCRA) sheets are to be provided on all chemicals, and the date on such sheets shall not be more than one year old.

1.4 EQUIPMENT SAFETY

- A. Unsafe and Broken Equipment
 - 1. No unsafe or broken equipment is to be permitted on the job. That includes, but is not limited to, such items as broken or bent ladders; uncharged fire extinguishers; electrical tools without grounds on plugs; and nicked, cut, or damaged extension or power tool cords. Should such items become damaged while on the job, they shall be removed from the jobsite.
- B. Security of Company Vehicles
 - 1. All company vehicles shall be parked securely with brakes set, locked, and with all loose tools secured from tampering by minors or children. No unattended Contractor vehicles shall be left on the jobsite at night or weekends. Vehicles left on the jobsite overnight by the Contractor shall be subject to towing by the Owner and the expense of such towing shall be borne by the Contractor.

1.5 BEHAVIOR

- A. Work Only in Pairs
 - 1. Two people should always work together. At no time should only one person be on the job alone.
- B. No Horseplay
 - 1. All work performed on the premises shall be in accordance with the OSHA safety guidelines. No horseplay or athletic activities on premises shall be permitted on breaks or at meal time by Contractor personnel.

1.6 DRESS AND CLOTHING

- A. Personal Protective Clothing
 - 1. All employees shall be properly dressed in proper personal protective clothing. Short pants are not permitted. Where dust, dirt, or fumes are in the vicinity, breathing protection shall be provided to the workers by the Contractor. No workers on the project shall work without shirts.
- B. Hazardous Object Handling
 - 1. While handling sharp objects, or any type of abrasive materials or debris, workers shall wear gloves, safety glasses, and hard-hats.

1.7 CLEAN-UP AND HOUSEKEEPING

- A. Clean-Up and Housekeeping
 - 1. Clean-up and housekeeping are a part of the job. The Contractor shall furnish trash containers and bags to store debris and trash pending removal. The jobsite shall be kept neat and clean at all times. The Contractor shall protect the buildings and grounds from

damage and blowing trash or debris. All wrappers from materials used on the job, fast food cups and bags, banding materials, and items of any other kind shall be bagged and removed immediately.

B. Safe Material Storage

1. All materials removed or stored pending installation shall be stored safely to prevent the materials from blowing in high winds, falling, or serving as a tripping hazard to workers or bystanders. Safe storage shall include tying bundles and weighting down with heavy objects.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 014500

PROJECT QUALITY CONTROL AND PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specified tests, inspections, and related actions do not limit Contractor's other quality assurance and quality control procedures that facilitate compliance with the Contract Document requirements.
 - 2. Requirements for Contractor to provide quality assurance and quality control services required by Engineer, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
- C. See Divisions 2 through 16 Sections for specific test and inspection requirements.

1.2 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual product incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Engineer.
- C. Preconstruction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.
- D. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.
- E. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.
- F. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- G. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

- H. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. Using a term such as “carpentry” does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as “carpenter.” It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.
- I. Experienced: When used with an entity, “experienced” means having successfully completed a minimum of 5 previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.3 COORDINATE WITH RELATED WORK

- A. Coordinate the work of this Section with the work of other trades under this Contract, including but not limited to:
 - 1. Section 011100 - Summary of Work
 - 2. Section 013300 - Submittal Procedures
 - 3. Section 016100 - Substitutions and Product Requirements

1.4 CONFLICTING REQUIREMENTS

- A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Engineer for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Engineer for a decision before proceeding.

1.5 SUBMITTALS

- A. Qualification Data: For testing agencies specified in “Quality Assurance” Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- B. Reports: Prepare and submit certified written reports that include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.
 - 8. Complete test or inspection data.
 - 9. Test and inspection results and an interpretation of test results.

10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 12. Name and signature of laboratory inspector.
 13. Recommendations on retesting and reinspecting.
- C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.6 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that is similar to those indicated for this Project in material, design, and extent.
- F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
1. Requirement for specialists shall not supersede building codes and regulations governing the Work.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of

manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

1.7 QUALITY CONTROL

- A. See Section 014529 – Testing Laboratory Services for additional information.
- B. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
 - 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
 - 2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- C. Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 - 1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 - 2. Notify testing agencies at least 48 hours in advance of time when Work that requires testing or inspecting will be performed.
 - 3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 - 4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 - 5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- D. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 01330 - "Submittal Procedures".
- E. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, the costs to provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents shall be the Contractor's responsibility.
- F. Testing Agency Responsibilities: Cooperate with Engineer and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
 - 1. Notify Engineer and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 - 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
 - 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.

4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 6. Do not perform any duties of Contractor.
- G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Safe Access to the Work (including all trench protection requirements).
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
- H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

SECTION 014529

TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Testing laboratory services and Contractor responsibilities related to those services.

1.2 REFERENCES

- A. ASTM C 1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.
- B. ASTM D 3666 - Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Bituminous Paving Materials.
- C. ASTM D 3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
- D. ASTM E 329 - Specification for Minimum Requirements for Agencies Engaged the Testing and/or Inspection of Materials Used in Construction.
- E. ISO/TEC Guide 25 - General Requirements for the Competence of Calibration and Testing Laboratories.

1.3 SELECTION AND PAYMENT

- A. The Owner will select, employ, and pay for services of an independent testing laboratory to perform inspection and testing as required.
- B. When required, the Contractor shall employ and pay for services of an independent testing laboratory or laboratories to perform inspection and testing identified in "Products" sections of the individual Specification.
- C. Employment of a testing laboratory by the Owner shall not relieve Contractor of obligation to perform work in accordance with requirements of Contract Documents.
- D. The Contractor will have the cost of retesting deducted from the estimate for payment whenever failed work must be removed and replaced and retested.

1.4 QUALIFICATION OF LABORATORY

- A. Meet laboratory requirements of ASTM E 329 and applicable requirements of ASTM C 1077, ASTM D 3666, and ASTM D 3740.
- B. Meet the ISO/TEC Guide 25 conditions for accreditation by the American Association for Laboratory Accreditation (A2LA) in specific fields of testing required in individual

Specification sections.

- C. Where a laboratory subcontracts any part of the testing services, such work shall be placed with a laboratory complying with the requirements of this Section.

1.5 LABORATORY REPORTS

- A. The testing laboratory shall provide and distribute copies of laboratory reports to the following: Owner(s), Engineer, and Contractor. Other copies of the reports may be required to be submitted to other parties. The testing laboratory will be informed of any other persons that required laboratory reports.
- B. One copy of each laboratory report distributed or emailed to the Contractor shall be kept at the site field office for the duration of the project.
- C. Before close of business on the working day following test completion and review, reports which indicate failing test results shall be transmitted immediately via email from the testing laboratory to the Owner, Contractor, and Engineer.

1.6 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the Work.
- C. Laboratory may not assume any duties of the Contractor.
- D. Laboratory has no authority to stop the Work unless a safety risk is imminent. The laboratory's representative shall immediately inform the Engineer and the Owner of any conflicts with the Contractor or Contractor's construction methods.

1.7 CONTRACTOR RESPONSIBILITIES

- A. Provide safe access to the Work and to applicable facilities (e.g. manufacturers, suppliers) for the Owner, Engineer, and testing laboratory personnel.
- B. Provide to the testing laboratory a copy of the construction schedule and a copy of each update to the construction schedule.
- C. Notify the Engineer and the testing laboratory during normal working hours of the day previous, but not less than 18 hours prior notice, to the expected time for operations requiring inspection and testing services. If the Contractor fails to make timely prior notification, then the Contractor shall not proceed with the operations requiring inspection and testing services.
- D. Notify the Engineer 24 hours in advance if the Specification requires the presence of the Engineer for sampling or testing.
- E. Request and monitor testing as required to provide timely results and to avoid delay to the

Work. Provide samples to the laboratory in sufficient time to allow the required test to be performed in accordance with specified test methods before the intended use of the material.

- F. Cooperate with laboratory personnel in collecting samples on site. Provide incidental labor and facilities for safe access to the Work to be tested; to obtain and handle samples at the site or at source of products to be tested; and to facilitate tests and inspections including storage and curing of test samples.

PART 2 - PRODUCTS – [Not Used]

PART 3 - EXECUTION

3.1 CONDUCTING TESTING

- A. Laboratory sampling and testing specified in individual Specification sections shall conform to the latest issues of ASTM standards, TxDOT methods, or other recognized test standards as approved by the Engineer.
- B. The requirements of this section shall also apply to those tests for approval of materials, for mix designs, and for quality control of materials as performed by the testing laboratories employed by the Contractor.

END OF SECTION

SECTION 015000

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Temporary utilities.
 - 2. Field offices and sheds.
 - 3. Temporary controls.
 - 4. Protection of installed Work.
 - 5. Security.
 - 6. Progress cleaning.
 - 7. Water, erosion, sediment, and dust control.
 - 8. Removal.

1.2 TEMPORARY ELECTRICITY

- A. Contractor shall furnish temporary electricity in the form of portable generators for electrical power throughout the entirety of the project in manner so as not to create a hazard to persons (unless otherwise agreed to in writing and authorized by the Owner).
- B. Provide power outlets for construction operations, with branch wiring and distribution boxes located as required. Provide flexible power cords as required.
- C. Maintain distribution system and provide routine repairs.

1.3 TEMPORARY LIGHTING

- A. Provide temporary lighting as required for construction and security purposes.
- B. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.
- C. Maintain lamps and provide routine repairs.

1.4 TEMPORARY VENTILATION

- A. Ventilate enclosed areas to facilitate curing of materials, disperse humidity, and prevent accumulations of dust, fumes, vapors, or gases.
- B. Provide temporary fan units as required to maintain clean air for construction.

1.5 TEMPORARY TELEPHONE AND FACSIMILE SERVICES

- A. Provide temporary telephone service required during construction. Mobile phone communication will be acceptable substitute for temporary telephone service.

- B. Provide Contractor's permanent office facsimile number for forwarding correspondence. Contractor's email address will be acceptable substitute for correspondence communications.

1.6 TEMPORARY WATER

- A. Contractor shall furnish temporary water as required throughout the entirety of the project in manner so as not to create a hazard to persons (unless otherwise agreed to in writing and authorized by the Owner).
- B. Extend branch piping and provide temporary hoses so that water is available at locations needed for work.

1.7 TEMPORARY SANITARY FACILITIES

- A. The contractor is required to provide temporary sanitary facilities as specified herein.
- B. Permanent toilets may not be used during construction.
- C. Maintain facilities in clean and sanitary condition.
- D. Sanitary facilities shall be obscured from public view to the greatest practical extent.
- E. The location shall be acceptable to the Owner.
- F. These facilities shall consist of properly enclosed self-contained portable units equipped with reservoirs that shall be maintained in proper sanitary condition by chemical treatment and periodic cleaning.
- G. Contractor shall enforce the use of such sanitary facilities by all personnel at the site.

1.8 FIELD OFFICES AND SHEDS

- A. Temporary field offices and storage sheds are optional for this project, as required by the Contractor for construction.
- B. Do not unreasonably encumber site or premises with excess materials or equipment.
- C. Temporary Structures (Optional):
 - 1. Portable or mobile buildings, structurally sound, weather tight, with floors raised above ground.
 - 2. Temperature transmission resistance: Compatible with occupancy and storage requirements.
 - 3. Provide connections for utility services when required.
 - 4. Provide steps and landings at entrances.
- D. Field Office (Optional):
 - 1. Size required for Contractor's use and to provide space for project meetings.
 - 2. Adequate electrical power, lighting, heating, and cooling to maintain human comfort.
 - 3. Furnishings and equipment:
 - a. Table and chairs for ten persons minimum.

- b. Facilities for storage of Project Record Documents.
- c. Computer with printer, modem, and e-mail service for communication.
- d. Digital camera with cable connection for computer.

1.9 BARRIERS

- A. Barricades, Warning Signs and Lights:
 - 1. Comply with recognized standards and code requirements for the erection of substantial barricades where needed to prevent accidents.
- B. Provide barricades required by governing authorities for public right-of-ways and for public access to existing facilities. Provide barriers to prevent unauthorized entry to construction areas, to allow Owner's use of premises, and to protect existing facilities and adjacent building from construction operations.
- C. Contractor shall provide signage and appropriate barricades to prevent any unsafe condition from developing during the course of the contract. Contractor shall properly store and secure materials to prevent unauthorized use.
- D. Fencing:
 - 1. Provide temporary fencing for construction operations.
 - 2. Construction: Commercial grade chain link.
 - 3. Height: 6 feet.
 - 4. Locate to protect construction operations, materials, and equipment and prevent unauthorized access to adjacent facilities.
 - 5. Provide vehicular gates and coordinate accessible access point with the Project Manager
 - 6. Maintain access to entries. Do not block or interrupt access to the adjacent buildings or prevent egress from the adjacent buildings.
 - 7. The Contractor shall maintain daily supervision of fencing to ensure compliance with requirements listed above.
- E. Protection of Trees, Plants and Building Surfaces:
 - 1. Do not remove roots or branches that interfere with construction. Consult with the Engineer or Owner if any branches need to be cut for installation of scaffolding and shoring
 - 2. Supervise earthwork operations to prevent damage to root zones.
 - 3. The contractor shall be responsible for the protection of existing building surfaces, both interior and exterior, utilities, exterior structures, pavement, sidewalks, trees and plant materials, irrigation systems, and all component parts and equipment.
 - 4. Landscaping around the project shall be preserved in their present condition.
 - 5. Provide temporary orange fencing barriers with studded steel "T" posts to height of 6 feet around individual or groups of trees and plants in the area barricaded for work on this project.
 - 6. Do not permit vehicular traffic, parking, storage of materials, dumping of harmful chemicals or liquids, or standing or continuously running water within root zones.
 - 7. The Contractor shall not deface, ruse, scar, injure, or destroy trees, or shrubs, not remove or cut in any way.

8. No ropes, cables, or guy wire shall be fastened to or attached to any existing tree for anchorage.
9. Any damage to existing elements, systems, components, or areas will be repaired at the responsibility of the contractor with the approval of the owner.
10. Immediately replace trees and plants that are damaged or destroyed due to construction operations with a nursery-grown tree or shrub of the same species and size approved by the Owner.
11. Provide services of qualified Arborist acceptable to the Owner to determine damage.
12. Repair tree damage by qualified tree surgeon.
13. Repairs and replacement not satisfactorily completed will be done by the Owner and deducted from the contractor's contract amount.

1.10 EXTERIOR CLOSURES

- A. Provide temporary weather tight closures for exterior openings to provide acceptable interior working conditions, to allow for temporary heating and maintenance of ambient temperatures required in individual specification sections, to protect the Work, and to prevent entry of unauthorized persons.
- B. Contractor must monitor weather and plan for proper sequencing of work and protection of openings. Provide temporary watertight closures for exterior openings in special conditions when new roofing and flashing cannot be installed and made waterproof by the end of a work day.
- C. Maintain interior ambient temperatures acceptable to the Owner.
- D. Work is to be weather tight prior to the onset of inclement weather, and at the end of every workday.

1.11 PROTECTION OF INSTALLED WORK

- A. Protect installed work from construction operations; provide special protection when required in individual specification sections.
- B. Minimize traffic, storage, and construction activities on waterproofed and roofed surfaces. If traffic, storage, or activity is necessary, obtain recommendations for protection from waterproofing or roofing manufacturer.
- C. Prohibit traffic from landscaped areas.

1.12 PROGRESS CLEANING

- A. Maintain areas free from waste materials, debris, and rubbish. Maintain site in clean and orderly condition on a daily basis.
- B. Provide containers for collection of waste materials, debris, and rubbish; remove and dispose of off site as required by construction activities.
- C. Periodically clean interior areas to provide suitable conditions for finish work.

1.13 TEMPORARY CONTROLS

- A. Water Control:
 - 1. Provide water barriers to protect site from soil erosion.
- B. Erosion and Sediment Control:
 - 1. The Contractor will be responsible for preparation of a Storm Water Pollution Prevention Plan (SWP3), and installation, inspection and maintenance of sediment and storm water controls. The SWP3 shall include an Erosion and Sediment Control Plan and Municipal Separate Storm Sewer System (MS4) control measures as required to satisfy all municipal, state and federal requirements.
 - a. Plan and execute methods to control surface drainage from cuts, fills, borrow areas, and waste disposal areas. Prevent erosion and sedimentation.
 - b. Minimize amount of bare soil exposed at any one time.
 - c. Provide temporary measures such as silt fences, dikes, berms, settlement basins, and drainage systems to prevent water flow and sedimentation.
 - d. Periodically inspect earthwork to detect erosion and sedimentation; promptly employ corrective measures.
- C. Dust Control:
 - 1. Provide dust control materials and methods to minimize dust from construction operations.
 - 2. Prevent dust from dispersing into atmosphere.

1.14 REMOVAL

- A. Remove temporary utilities, equipment, facilities, and services when construction needs can be met by use of permanent construction or upon completion of Project.
- B. Clean and repair damage caused by installation or use of temporary work.
- C. Restore existing and permanent facilities used during construction to original or to specified condition.

1.15 TEMPORARY FIRE PROTECTION

- A. Review fire prevention and protection needs with the Owner's Safety Office officials and establish procedures to be followed in the event of fire.
- B. Instruct personnel in procedures and post warnings and information.
- C. Maintain unobstructed access to fire extinguishers, temporary fire protection facilities, stairways and other access routes.
- D. Where equipment is used that employs heat, welding or fire, the contractor must have a fire blanket and fire extinguisher in the immediate area that work is being performed. The contractor must also maintain a fire watch in this area of work for a minimum of two hours after work has stopped.
- E. Prohibit smoking in hazardous areas.

- F. Provide supervision of welding operations, combustion type temporary heating units, and similar sources of ignition.
- G. The contractor shall be responsible for initiating, maintaining, and supervising safety precautions and programs associated with the work.
- H. It shall be the duty and responsibility of the contractor to comply with all pertinent sections of the OSHA Regulations, and all amendments thereof.
- I. The contractor shall do all things necessary and provide all equipment and labor necessary to protect the general public from dangers associated with the contract.
- J. Walkways, parking areas, and other areas surrounding the job site will be in use and given priority.
- K. The Owner shall not be held responsible for failure of the contractor to perform the job in a safe manner.

1.16 MISCELLANEOUS

- A. Contractor Use of Premises:
 - 1. The Contractor shall limit his use of the premises to the work indicated, so as to allow for owner occupancy.
- B. Ongoing Building Operations:
 - 1. The BISD Food Nutrition Service facility shall remain occupied and in service throughout the completion of the roof repair scope of work. The contractor shall schedule all roof repair scope and roof panel removal and replacement to ensure the facility remains in operation and weather tight at the end of each work day.
- C. Contractors are responsible for having visited the site and having determined the general and specific working conditions and limitations, ingress and egress capabilities, any needed measurements, calculations, or special equipment requirements. Failure to do so, for any reason, will not relieve the Contractor from responsibility for successfully performing and completing the work, without additional expense to the Owner.
- D. Confine operations at the site to the areas permitted under the Contract. Portions of the site beyond areas on which work is indicated are not to be disturbed. Conform to site rules and regulations affecting the work while engaged in project work performance.
- E. Work on the building will be only allowed during the scheduled work performance time, reference Section 011100 – Summary of Work. Work during other times shall only be allowed with 96-hour written prior request and written authorization.
- F. Keep existing driveways and entrances serving the premises clear and available to the Owner and his employees at all times. Do not use these areas for parking or storage of materials, unless approved in advance by the Owner.
- G. Parking: Contractor shall park in designated areas as shown on the drawings.

1. Contractor is to coordinate location of stalls with the Project Manager and Owner. Delivery vehicles will be permitted, but must be unloaded and moved immediately and will not be allowed to remain near the building unless unloading of materials is in progress. Coordinate permissible loading areas with the Project Manager and Owner.
 2. Due to limited space, only work trucks will be allowed at the worksite, and these may be limited in number. Contractor shall make every effort to carpool when possible.
- H. Security:
1. The contractor assumes all liability for any action which may occur as the result of failing to secure an area.
 2. All employees of the contractor, while on the job site, shall maintain appropriate appearance. This shall include proper dress for the job (i.e. shirt and shoes to be worn at all times). This shall also include proper identification. A contractor's employee may be asked to show identification by the Owner's staff at any time.
 3. All employees of the contractor shall maintain proper conduct in regard to personal actions and contact with Owners and renters while on property. This shall also include no drug and/or alcohol use and no profane language. Any employee of the contractor engaging in improper conduct will be required to be permanently removed from the job site.
 4. The contractor shall not discriminate against any person because of race, sex, age, creed, color, religion, national origin, or disability.
- I. Noise Control:
1. Equipment locations and timing or sequence of work operations shall be coordinated so as to not conflict with the Owner's continuing use of the building and adjacent buildings and/or create any interference with scheduled meetings or events. Reference Section 011100 – Summary of Work for additional requirements.

PART 2 PRODUCTS

2.1 SCAFFOLDS AND LIFTS

- A. Contractors must meet or exceed all requirements established by Federal/State/Local regulations relating to scaffold safety.
- B. Scaffolding must be designed by or under the direct supervision of a registered professional engineer.
- C. Provide temporary guys, braces, shoring, falsework supports, and anchors required for existing elements and surfaces.
- D. Provide temporary protection for existing surfaces used to support scaffolding and supports.
- E. Do not overstress or damage existing surfaces or elements.

- F. Provide temporary covered walkways to provide for public access to existing buildings.
- G. Provide Emergency Weather Plan. Plan to include items such as wind ratings for scaffolding and disassembly and storage plan during hurricanes or other weather phenomena.

2.2 OVERHEAD WORK

- A. The Contractor is to provide and maintain a protected covered area for ingress and egress to the building when performing work above the entrances and emergency exits to the facility. Contractor is responsible for determining limits of barricades and covered pedestrian walkway to ensure the safety of pedestrians. Contractor is to provide adequate pedestrian protection and barricades on the interior of the facility to protect pedestrians from falling objects in the area of construction.
- B. No overhead work shall be performed by contractor when, as a result of that work, the potential exists of an object falling and striking a person. Contractor is to monitor wind conditions and provide for safe working conditions and an adequately barricaded area.
- C. When lifting and swinging heavy material over roofs, area under roof must be unoccupied and appropriately barricaded. The contractor shall provide tarpaulins, scaffolds, warning signs, etc. that protect pedestrians in the areas surrounding the project. Hard hats shall be worn at all times by contractor personnel.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 015526

TRAFFIC CONTROL AND REGULATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Requirements for signs, signals, control devices, flares, lights and traffic signals, as well as construction parking control, designated haul routes and bridging of trenches and excavations.
- B. Requirement for and qualifications of flagmen.

1.2 UNIT PRICES

- A. Unit Prices
 - 1. No separate payment will be made for work performed under this Section. Include cost of such work in Contract unit prices for items listed in bid form requiring traffic control and regulation.

1.3 SUBMITTALS

- B. The contractor shall submit for approval by the Owner and prior to the beginning of work a Traffic Control Plan responsive to the Texas Manual on Uniform Traffic Control Devices (TMUTCD) and sealed by a Registered Professional Engineer.
- C. For both the traffic control plan and flagmen use, submit schedules of values in accordance with Section 01 33 00 - Submittal Procedures.
- D. Make submittals in accordance with Section 01 33 00 - Submittal Procedures.

PART 2 - PRODUCTS

2.1 SIGNS, SIGNALS, AND DEVICES

- A. Comply with Texas State Manual on Uniform Traffic Control Devices.
- B. Traffic Cones and Drums, Flares and Lights: As approved by local jurisdictions.

PART 3 - EXECUTION

3.1 PUBLIC ROADS

- A. Abide by laws and regulations of governing authorities when using public roads. If the Contractor's work requires that public roads be temporarily impeded or closed, approvals shall be obtained from governing authorities and permits paid for before starting any work. Coordinate activities with the Owner.

- B. Contractor shall always maintain a 10-foot-wide all-weather lane adjacent to work areas which shall be kept free of construction equipment and debris and shall be for the use of emergency vehicles, or as otherwise provided in the traffic control plan.
- C. Contractor shall not obstruct the normal flow of traffic from 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m. on designated major arterials or as directed by the Owner.
- D. Contractor shall maintain local driveway access to residential and commercial properties adjacent to work areas at all times.
- E. Cleanliness of Surrounding Streets: Keep streets used for entering or leaving the job area free of excavated material, debris, and any foreign material resulting from construction operations.

3.2 CONSTRUCTION PARKING CONTROL

- A. Control vehicular parking to prevent interference with public traffic and parking, access by emergency vehicles, and Owner's operations.
- B. Monitor parking of construction personnel's vehicles in existing facilities. Maintain vehicular access to and through parking areas.
- C. Prevent parking on or adjacent to access roads or in non-designated areas.

3.3 FLARES AND LIGHTS

- A. Provide flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.

3.4 HAUL ROUTES

- A. Utilize haul routes designated by authorities or shown on the Drawings for construction traffic.
- B. Confine construction traffic to designated haul routes.
- C. Provide traffic control at critical areas of haul routes to regulate traffic and minimize interference with public traffic.

3.5 TRAFFIC SIGNS AND SIGNALS

- A. Install traffic control devices at approaches to the site and on site, at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.
- B. Install and operate traffic control signals to direct and maintain orderly flow of traffic in areas under Contractor's control and areas affected by Contractor's operations.

- C. Relocate traffic signs and signals as Work progresses to maintain effective traffic control.

3.6 BRIDGING TRENCHES AND EXCAVATIONS

- A. Whenever necessary, bridge trenches and excavation to permit an unobstructed flow of traffic.
- B. Vehicle crossings must be designed by and installed under the supervision of a registered professional engineer.
- C. Secure bridging against displacement by using adjustable cleats, angles, bolts or other devices whenever bridge is installed:
 - 1. On an existing bus route;
 - 2. When more than five percent of daily traffic is comprised of commercial or truck traffic;
 - 3. When more than two separate plates are used for the bridge; or
 - 4. When bridge is to be used for more than five consecutive days.
- D. Install bridging to operate with minimum noise.
- E. Adequately shore the trench or excavation to support bridge and traffic.
- F. Extend steel plates used for bridging a minimum of two foot beyond edges of stable trench walls or excavation. Use temporary paving materials (premix) to feather edges of plates to minimize wheel impact on secured bridging.
- G. Steel plates shall support H-20 loaded truck or loadings that produces maximum stress.

3.7 REMOVAL

- A. Remove equipment and devices when no longer required.
- B. Repair damage caused by installation.
- C. Remove post settings to a depth of 2 feet.

END OF SECTION

SECTION 015713

TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Description of erosion and sediment control and other control-related practices, which shall be utilized during construction activities.

1.2 UNIT PRICES

- A. Payment for this item shall be made on a lump sum basis for the maintenance of the temporary erosion and sediment control and other TPDES requirements. The costs associated with TPDES inspection and reporting shall also be included in this item.

1.3 RESPONSIBILITY

- A. It is the contractor's responsibility to acquire a Texas Pollutant Discharge Elimination System (TPDES) Permit as indicated in Section 01 57 23 TPDES Requirements (SWPPP provided by Contractor).
- B. All work performed under this section must be as per construction plans and TPDES approved Permit.

PART 2 - PRODUCTS - [Not Used]

PART 3 - EXECUTION

3.1 PREPARATION AND INSTALLATION

- A. No clearing and grubbing or rough cutting shall be permitted until erosion and sediment control systems are in place, other than site work specifically directed by the Owner's Representative to allow soil testing and surveying.
- B. Equipment and vehicles shall be prohibited by the Contractor from maneuvering on areas outside of dedicated rights-of-way and easements for construction. Damage caused by construction traffic to erosion and sediment control systems shall be repaired immediately by the Contractor.
- C. The Contractor shall be responsible for collecting, storing, hauling, and disposing of spoil, silt, and waste materials as specified in this or other Specifications and in compliance with applicable federal, state, and local rules and regulations.
- D. Contractor shall conduct all construction operations under this Contract in conformance with the erosion control practices described in the SWPPP, Drawings, and this Specification.

- E. The Contractor shall install, maintain, and inspect erosion/sediment control measures and practices as specified in the SWPPP, TPDES Permit, Drawings, and in this or other Specifications.

3.2 TOPSOIL PLACEMENT FOR EROSION AND SEDIMENT CONTROL SYSTEMS

- A. When topsoil is specified as a component of another Specification, the Contractor shall conduct erosion control practices described in this Specification during topsoil placement operations.
 - 1. When placing topsoil, maintain erosion and sediment control systems, such as swales, grade stabilization structures, berm, dikes, waterways, and sediment basins.
 - 2. Maintain grades which have been previously established on areas to receive topsoil.
 - 3. After the areas to receive topsoil have been brought to grade, immediately prior to dumping and spreading the topsoil, loosen the sub grade by disking or by scarifying to a depth of at least 2 inches to permit bonding of the topsoil to the subsoil.
 - 4. No sod or seed shall be placed on soil which has been treated with soil sterility until sufficient time has elapsed to permit dissipation of toxic materials.

3.3 SEDIMENT CONTROL MAINTENANCE

- A. All erosion, sediment, and water pollution controls will be maintained in good working order. A rain gauge provided by the Contractor shall be located on the project site. Within 24 hours of a rainfall event of 0.5 inches or more as measured by the project rain gauge, the Contractor and the Owner's Representative shall inspect the entire project to determine the condition of the control measures. Sediment shall be removed and devices repaired as soon as practicable but no later than 7 days after the surrounding ground has dried sufficiently to prevent further damage from equipment operations needed for repairs.
- B. In the event of continuous rainfall over a 24 hour period, or other circumstances that preclude equipment operation in the area, the Contractor shall install additional backup storm water pollution control devices, as determined by the Owner's Representative, by other appropriate methods. The Contractor shall remove sediment accumulations and deposit the spoils in an area approved by the Owner's Representative as soon as practical and in accordance with the SWPPP. Any corrective action needed for the control measures is to be accomplished in the sequence directed by the Owner's Representative; however, areas adjacent to receiving waters shall generally have priority, followed by devices protecting storm sewer inlets.

3.4 DUST CONTROL

- A. Implement dust control methods to control dust creation and movement on construction sites and roads and to prevent airborne sediment from reaching receiving streams or storm water conveyance systems, to reduce on-site and off-site damage, to prevent health hazards, and to improve traffic safety.

- B. Control blowing dust by using one or more of the following methods:
 - 1. Mulches bound with chemical binders.
 - 2. Temporary vegetative cover.
 - 3. Spray-on adhesives on mineral soils when not used by traffic.
 - 4. Tillage to roughen surface and bring clods to the surface.
 - 5. Irrigation by water sprinkling.
 - 6. Barriers using solid board fences, snow fences, burlap fences, crate walls, bales of straw, or similar materials.
- C. Implement dust control methods immediately whenever dust can be observed blowing on the project site.

3.5 OFFSITE ROADWAY MAINTENANCE

- A. Keep streets clean of construction debris and mud carried by construction vehicles and equipment. If necessary to keep the streets clean, install stabilized construction exits at construction, staging, storage, and disposal areas. A vehicle/equipment wash area (stabilized with coarse aggregate) may be installed adjacent to the stabilized construction exit, as needed. Release wash water into a drainage swale or inlet protected by erosion and sediment control measures. Construction exit and wash areas are shown in the construction plan Details, as Stabilized Construction Exit Detail.
- B. In addition to stabilized construction exits, shovel or sweep the pavement to the extent necessary to keep the street clean. Water hosing or sweeping of debris and mud off of the street into adjacent areas is not allowed.

3.6 EQUIPMENT MAINTENANCE AND REPAIR

- A. Confine maintenance and repair of construction machinery and equipment to areas specifically designated for that purpose. Locate such areas so that oils, gasoline, grease, solvents, and other potential pollutants cannot be washed directly into receiving streams or storm water conveyance systems. Provide these areas with adequate waste disposal receptacles for liquid as well as solid waste. Clean and inspect maintenance areas daily.
- B. On a construction site where designated equipment maintenance areas are not feasible, take precautions during each individual repair or maintenance operation to prevent potential pollutants from washing into streams or conveyance systems. Provide temporary waste disposal receptacles.

3.7 WASTE COLLECTION AND DISPOSAL

- A. Contractor shall formulate and implement a plan for the collection and disposal of waste materials on the construction site. In plan, designate locations for trash and waste receptacles and establish a collection schedule. Methods for ultimate disposal of waste shall be specified and carried out in accordance with applicable local, state, and federal health and safety regulations. Make special provisions for the collection and disposal of liquid wastes and toxic or hazardous materials.
- B. Keep receptacles and waste collection areas neat and orderly to the extent possible. Waste shall not be allowed to overflow its container or accumulate from day-to-day. Locate trash collection points where they will least likely be affected by concentrated storm water runoff.

3.8 WASHING AREAS

- A. Vehicles such as concrete delivery trucks or dump trucks and other construction equipment shall not be washed at locations where the runoff will flow directly into a watercourse or storm water conveyance system. Designate special areas for washing vehicles. Locate these areas where the wash water will spread out and evaporate or infiltrate directly into the ground, or where the runoff can be collected in a temporary holding or seepage basin. Beneath wash areas construct a gravel or rock base to minimize mud production.

3.9 STORAGE OF CONSTRUCTION MATERIALS AND CHEMICALS

- A. Isolate sites where chemicals, cements, solvents, paints, or other potential water pollutants are stored in areas where they will not cause runoff pollution.
- B. Store toxic chemicals and materials, such as pesticides, paints, and acids in accordance with manufacturers' guidelines. Protect groundwater resources from leaching by placing a plastic mat, packed clay, tar paper, or other impervious materials on any areas where toxic liquids are to be opened and stored.

3.10 DEMOLITION AREAS

- A. Demolition activities which create large amounts of dust with significant concentrations of heavy metals or other toxic pollutants shall use dust control techniques to limit transport of airborne pollutants. However, water or slurry used to control dust contaminated with heavy metals or toxic pollutants shall be retained on the site and shall not be allowed to run directly into watercourses or storm water conveyance systems. Methods of ultimate disposal of these materials shall be carried out in accordance with applicable local, state, and federal health and safety regulations.

3.11 SANITARY FACILITIES

- A. Provide and maintain sanitary facilities for persons on the job site; comply with the regulations of State and local departments of health.

- B. Enforce the use of sanitary facilities by construction personnel at the job site. Such facilities shall be enclosed. Pit-type toilets will not be permitted. No discharge will be allowed from these facilities. Collect and store sewage and waste so as not to cause a nuisance or health problem; have sewer and waste hauled off-site and properly disposed in accordance with local regulations.
- C. Located toilets near the Work site and secluded from view insofar as possible. Keep toilets clean and supplied throughout the course of the Work.

3.12 PESTICIDES

- A. Use and store pesticides during construction in accordance with manufacturers' guidelines and with local, state, and federal regulations. Avoid overuse of pesticides which could produce contaminated runoff. Take great care to prevent accidental spillage. Never wash pesticide containers in or near flowing streams or storm water conveyance systems.

END OF SECTION

SECTION 015723

TPDES REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This Section describes the required documentation to be prepared and signed by the Contractor before conducting construction operations, in accordance with the terms and conditions of the Texas Pollutant Discharge Elimination System (TPDES) General Permit Number TXR150000 for discharges of storm water runoff from small construction sites.
- B. The Contractor shall be responsible for providing and implementing a Storm Water Pollution Prevention Plan (SWPPP), prepared by and sealed by a licensed professional engineer, for this project.
- C. Contractor shall review implementation of the SWPPP in a meeting with the Owner and Engineer prior to start of construction.

1.02 UNIT PRICES

- A. Payment for this item shall be made on a lump sum basis and shall cover the preparation and submittal of all required plans, forms, payment of permit fees (if any), cost of implementation and maintenance of the storm water control measures as required throughout the project.

1.03 REFERENCES

- A. Part II.E.2. of the Texas Commission on Environmental Quality (TCEQ) General Permit Number TXR150000.
- B. Part II.F.3 of TCEQ General Permit Number TXR150000 (notification of MS4 operator)

PART 2 PRODUCTS - As required by Storm Water Pollution Prevention Plan.

PART 3 EXECUTION

3.01 STORM WATER POLLUTION PREVENTION PLAN

- A. Prior to start of construction activities, the Contractor shall provide a Storm Water Pollution Prevention Plan, prepared by and sealed by a registered professional engineer, for this project.
- B. Contractor shall be responsible for implementation, maintenance, and inspection of storm water pollution prevention control measures including, but not limited to, erosion and sediment controls, storm water management plans, waste collection and disposal, off-site vehicle tracking, and other practices shown on the SWPPP, or as specified by TCEQ or elsewhere in this or other Specifications.

3.02 RETENTION OF RECORDS

- A. The Contractor shall keep a copy of the Storm Water Pollution Prevention Plan at the

construction site or at the Contractor's office from the date that it became effective to the date of project completion.

- B. At project closeout, the Contractor shall submit to Owner all TPDES forms and certifications, as well as a copy of the SWPPP. Storm water pollution prevention records and data will be retained by Owner for a period of 3 years from the date of project completion.

3.03 NOTICES

The following notices shall be posted from the date that this SWPPP goes into effect until the date of final site stabilization:

A. Regulatory Agency Notices

1. Small Construction Site Notice: The Contractor shall complete and sign the attached Small Construction Site Notice. Copies of the signed notice shall be submitted to TCEQ, the Owner, Engineer, and Owner. Copy of the signed notice shall also be posted at the construction site, as specified.
2. Notice of Intent: The Contractor shall complete and sign a Notice of Intent (NOI) as "Operator" and submit it along with all required fees to the TCEQ, the Owner, Engineer, and other required agencies.
3. TPDES General Permit: A copy of the TCEQ's TPDES storm water general construction permit TXR150000 acknowledgement certificate shall be submitted to Owner, Engineer, and other required agencies and shall be posted at the construction site, as specified.

B. OTHER REQUIRED NOTICES

1. Notice to drivers of equipment and vehicles, instructing them to stop, check, and clean tires of debris and mud before driving onto traffic lanes. Post such notices at every stabilized construction exit area.
2. In an easily visible location on site, post a notice of waste disposal procedures.
3. If applicable, notice of hazardous material handling and emergency procedures shall be posted on site. Keep copies of Material Safety Data Sheets at a location on site that is known to all personnel.
4. Keep a copy of each signed certification at the construction site or at Contractor's office.

END OF SECTION

SECTION 016100

SUBSTITUTIONS AND PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Products.
 - 2. Transportation and handling.
 - 3. Storage and protection.
 - 4. Reuse of existing materials.
 - 5. Product options.
 - 6. Substitutions.

1.2 PRODUCTS

- A. Provide interchangeable components by the same manufacturer for identical items.
- B. Do not reuse materials and equipment removed from existing construction in completed Work, except as specifically permitted by the Contract Documents.

1.3 TRANSPORTATION AND HANDLING

- A. Coordinate delivery of Products to prevent conflict with Work and adverse conditions at site.
- B. Transport and handle Products in accordance with manufacturer's instructions.
- C. Promptly inspect shipments to ensure that Products comply with requirements of Contract Documents, are undamaged, and quantities are correct.
- D. Provide equipment and personnel to handle products by methods to prevent damage.

1.4 STORAGE AND PROTECTION

- A. Store and protect Products in accordance with manufacturer's instructions with manufacturer's seals and labels intact and legible.
- B. Store Products on site unless prior written approval to store off site has been obtained from Owner.
- C. Store Products subject to damage by elements in weather tight enclosures. Maintain temperature and humidity within ranges required by manufacturer's instructions.
- D. Exterior Storage:
 - 1. Store fabricated Products above ground; prevent soiling and staining.
 - 2. Cover products subject to deterioration with impervious sheet coverings; provide ventilation to prevent condensation.

3. Store loose granular materials in well drained area on solid surfaces; prevent mixing with foreign matter.
- E. Arrange storage areas to permit access for inspection. Periodically inspect stored products to verify that products are undamaged and in acceptable condition.
- F. Coordinate location of stored item on-site with Engineer.

1.5 REUSE OF EXISTING MATERIALS

- A. Carefully remove, handle, protect, and store Products.
- B. Clean and refinish Products to original or specified condition.
- C. Restore operable components to working condition.
- D. Arrange and pay for transportation, storage, and handling of Products requiring off site storage, restoration, or renovation.

1.6 PRODUCT OPTIONS

- A. Products specified by reference standard only:
 1. Select any Product meeting the specified standard.
 2. Submit Product Data to substantiate compliance of proposed Product with specified requirements.
 3. Products specified by naming two or more acceptable Products: Select any named Product.
- B. Products specified by stating that the Contract Documents are based on a Product by a single manufacturer followed by the statement "Equivalent products by the following manufacturers are acceptable":
 1. Select the specified Product or a Product by a named manufacturer having equivalent or superior characteristics to the specified Product and meeting the requirements of the Contract Documents.
 2. If the specified Product is not selected, submit Product Data to substantiate compliance of proposed Product with specified requirements.
 3. The specified Product establishes the required standard of quality.
- C. Products specified by naming one or more Products followed by "or approved substitute" or similar statement:
 1. Submit a Substitution Request Form for Products not listed.
 2. The specified Product establishes the required standard of quality.
- D. Products specified by naming one or more Products or manufacturers followed by the statement "Substitutions: Under provisions of Division 1":
 1. Submit a Substitution Request Form for Products not listed.
 2. The specified Product establishes the required standard of quality.
- E. Products specified by naming one Product followed by the statement "Substitutions: Not permitted": Substitutions will not be allowed.

- F. Products specified by required performance or attributes, without naming a manufacturer or Product:
 - 1. Select any Product meeting specified requirements.
 - 2. Submit Product Data to substantiate compliance of proposed Product with specified requirements.

1.7 SUBSTITUTIONS

- A. Do not substitute Products unless a Substitution Request Form has been approved by the Engineer.
- B. Substitutions during Bidding will not be allowed, unless noted otherwise.
- C. Engineer will consider Substitution Requests within 15 days after award of Contract. After initial 15 day period, Substitutions Requests will be considered only due to non-availability of a specified Product.
- D. In case of non-availability of a specified Product notify Engineer in writing as soon as non-availability becomes apparent.
- E. Submit Substitution Requests using Substitution Request Form provided by Engineer, see Section 01620. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents, including:
 - 1. Product identification, including name and address of manufacturer.
 - 2. Product description, performance and test data, and reference standards.
 - 3. Sample, if requested.
 - 4. Description of any anticipated effect that acceptance of proposed Substitution will have on Progress Schedule, construction methods, or other items of Work.
 - 5. Description of any differences between specified product and proposed Substitution.
- F. Submit two copies. Engineer will return one copy to Contractor for printing and distribution.
- G. A request constitutes a representation that the Contractor:
 - 1. Has investigated the proposed Product and determined that it meets or exceeds the quality level of the specified Product.
 - 2. Will provide the same warranty for the Substitution as for the specified Product.
 - 3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
 - 4. Waives claims for additional costs or time extension that may subsequently become apparent.
 - 5. Will reimburse Owner for design services associated with re-approval by authorities or revisions to Contract Documents to accommodate the Substitution.
- H. Substitutions will not be considered if:
 - 1. They are indicated or implied on Shop Drawings or other submittals without submittal of a Substitution Request Form.
 - 2. Approval will require substantial revision of Contract Documents without additional compensation to Engineer.

- I. Approved substitutions will be incorporated into Contract Documents by Change Order.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 017400

CLEANING

PART 1 GENERAL

1.1 SUMMARY

- A. During the course of the Work, maintain premises and adjacent sites free of waste, debris, and rubbish caused by construction operations.
- B. At completion of work, or at such other times as directed by the Engineer or Owner, remove waste, debris, rubbish, tools, equipment, machinery, and surplus materials. Clean sight- exposed surfaces; leave work area clean and ready for use.

1.2 SAFETY REQUIREMENTS

- A. Standards: Maintain Project in accordance with the following safety and insurance standards:
 - 1. Occupation Safety and Health Administration (OSHA)
- B. Hazards Control:
 - 1. Store volatile wastes in an approved manner or remove from premises daily.
 - 2. Prevent accumulation of wastes that create hazardous conditions.
 - 3. Provide adequate ventilation during use of volatile or noxious substances.
- C. Conduct cleaning and disposal operations to comply with federal, state and local antipollution laws.
 - 1. Rubbish and waste materials shall not be burned or buried on Project site.
 - 2. Volatile wastes, such as mineral spirits, oil, or paint thinner, shall not be disposed of into storm or sanitary drains.
 - 3. Wastes shall not be disposed of into streams or waterways.

1.3 SUBMITTALS

- A. Product Data:
 - 1. Manufacturer's recommendations for cleaning specified products.
 - 2. Proposed cleaning products for products where manufacturer's recommendations are not specified.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Select and use cleaning materials and equipment with care to avoid scratching, marring, defacing, staining, or discoloring surfaces cleaned.
- B. Use only cleaning materials recommended by manufacturer of surface material to be cleaned.
- C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 EXECUTION

3.1 GENERAL

- A. Execute cleaning to ensure that buildings, grounds and public properties are maintained free from accumulations of waste materials and rubbish on a **daily** basis.
- B. Wet down materials and rubbish to lay dust and to prevent blowing dust.
- C. Clean site and public properties daily, and dispose of waste materials, debris, and rubbish.
- D. Provide on-site transportable cart containers for collection of waste, materials, debris, and rubbish as required.
- E. Remove waste materials, debris, and rubbish from site and legally dispose of at public or private dumping areas off Owner's property.
- F. Handle materials in a controlled manner with as few handlings as possible. Materials shall not be thrown from heights.
- G. Maintain equipment on site, while work is in progress, in clean and dust-free condition.
- H. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly finished surfaces.
- I. Contain all runoff from Work and do not allow construction waste to leach into ground or water.

3.2 FINAL CLEANING

- A. Employ experienced workmen for final cleaning.
- B. In preparation for Substantial Completion, or occupancy, conduct final inspection of sight- exposed surfaces and of concealed spaces.
- C. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from sight- exposed finished surfaces.
- D. Repair, patch, and touch up marred surfaces to specified finish and to match adjacent surfaces.
- E. Broom clean paved surfaces; rake clean other surfaces on grounds.
- F. Clean equipment units if cleaning is required due to construction dust and activities.
- G. Maintain cleaning until project, or designated portion thereof, is occupied by Owner.

END OF SECTION

SECTION 017700

CLOSEOUT PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Closeout procedures.
 - 2. Final cleaning.
 - 3. Adjusting.
 - 4. Project record documents.
 - 5. Operation and maintenance data.
 - 6. Warranties.
 - 7. Replacement parts and maintenance materials.
 - 8. Demonstration and instructions.
- B. Related Sections:
 - 1. Section 012000 - Payment Procedures
 - 2. Section 015000 - Temporary Facilities and Controls
 - 3. Section 017400 - Cleaning

1.2 CLOSEOUT PROCEDURES

- A. Final Inspection:
 - 1. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with the Contract Documents and ready for inspection by the Project Manager and Engineer.
 - 2. If Project Manager or Engineer performs reinspection due to failure of Work to comply with claims of status of completion made by Contractor, Owner will compensate the Project Manager and Engineer for such additional services and will deduct the amount of such compensation from final payment.
- B. Submit final Application for Payment showing original Contract Sum, adjustments, previous payments, retainage withheld from previous payments, and sum remaining due.
- C. Closeout Submittals:
 - 1. Evidence of compliance with requirements of governing authorities.
 - 2. Construction photographs.
 - 3. List of subcontractors and suppliers, indicating firm name, area of responsibility or specialty, address, and telephone number.
 - 4. Certificate of Occupancy.
 - 5. Project Record Documents.
 - 6. Operation and Maintenance Data.
 - 7. Warranties.
 - 8. Keys and keying schedule.
 - 9. Replacement parts and maintenance materials.

10. Evidence of payment of Subcontractors and suppliers.
11. Final lien waiver.
12. Certificate of insurance for products and completed operations.
13. Consent of Surety to final payment.

1.3 FINAL CLEANING

- A. Execute final cleaning in areas affected by work on this project prior to final inspection.
- B. Clean surfaces exposed to view:
 1. Clean glass.
 2. Remove temporary labels, stains and foreign substances.
 3. Polish transparent and glossy surfaces.
 4. Vacuum carpeted surfaces; damp mop hard surface flooring.
 5. Pressure wash all horizontal surfaces with 1000 psi removing dirt and debris
 6. Pressure wash all vertical surfaces with 100 psi removing dirt and debris
- C. Clean equipment and fixtures to a sanitary condition.
- D. Clean or replace filters of operating equipment.
- E. Clean debris from roofs and drainage systems
- F. Clean site; sweep paved areas, rake clean landscaped surfaces.
- G. Remove waste and surplus materials, rubbish, and construction facilities from the site.

1.4 FINAL PAYMENT

- A. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
 1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- B. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
 1. Evidence of completion of Project closeout requirements.
 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 3. Updated final statement, accounting for final changes to the Contract Sum.
 4. ABP-1, "Contractor's Affidavit of Bills Paid."
 5. Contractor's Affidavit of Release of Liens.
 6. Consent of Surety to Final Payment.
 7. Evidence that claims have been settled.

8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.

1.5 ADJUSTING

- A. Adjust operating Products and equipment to ensure smooth and unhindered operation.

1.6 PROJECT RECORD DOCUMENTS

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
 1. Drawings.
 2. Specifications.
 3. Addenda.
 4. Change Orders and other Modifications to the Contract.
 5. Reviewed Shop Drawings, Product Data, and Samples.
- B. Store Record Documents separate from documents used for construction.
- C. Record information concurrent with construction progress.
- D. Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:
 1. Manufacturer's name and product model and number.
 2. Product substitutions or alternates utilized.
 3. Changes made by Addenda and Modifications.
- E. Record Documents and Shop Drawings: Legibly mark each item to record actual construction including:
 1. Location, type and size of work completed.
 2. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 3. Field changes of dimension and detail.
 4. Details not on original Contract Drawings.
- F. Prior to Substantial Completion transfer marks made during construction to two sets of sepia reproducible transparency prints, and one half size set.
- G. Submit documents to Project Manager with final Application for Payment.

1.7 OPERATION AND MAINTENANCE DATA

- A. Provide three copies, 8-1/2 x 11 inches text pages, bound in three ring binders with durable plastic covers.
- B. Prepare binder covers with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project, and subject matter of binder when multiple binders are required.

- C. Contents:
 - 1. Directory: List names, addresses, and telephone numbers of Engineer, Subcontractors, and major equipment suppliers.
 - 2. Operation and maintenance instructions: Arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
 - a. Significant design criteria.
 - b. List of equipment.
 - c. Parts list for each component.
 - d. Operating instructions.
 - e. Maintenance instructions for equipment and systems.
 - f. Maintenance instructions for special finishes, including recommended cleaning methods and materials and special precautions identifying detrimental agents.
 - 3. Project documents and certificates including:
 - a. Shop drawings and product data.
 - b. Certificates.
 - c. Photocopies of warranties and bonds.
- D. Submittal:
 - 1. Submit one copy of completed volumes in final form 15 days prior to final inspection.
 - 2. Engineer will notify of any required revisions after final inspection.
 - 3. Revise content of documents as required prior to final submittal.
 - 4. Submit revised volumes within 10 days after final inspection.

1.8 WARRANTIES

- A. Provide two copies of each warranty.
- B. Execute and assemble documents from Subcontractors, suppliers, and manufacturers.
- C. Provide Table of Contents and assemble in three ring binder with durable plastic cover.
- D. Submit prior to final Application for Payment.
- E. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within 10 days after acceptance, listing date of acceptance as start of warranty period.

1.9 REPLACEMENT PARTS AND MAINTENANCE MATERIALS

- A. Provide products, manufacturer's recommended primary replacement parts, operations and maintenance manuals and associated materials in quantities specified in individual specification Sections.
- B. Deliver to Project site in location as directed; obtain receipt prior to final payment.

1.10 DEMONSTRATION AND INSTRUCTIONS

- A. Demonstrate operation and maintenance of Products to Owner's personnel two weeks prior to date of Substantial Completion.
- B. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- C. Utilize Operation and Maintenance Manuals as basis for instruction. Review contents of manual with Owners' 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 upon times, at equipment location.
- E. Prepare and insert additional data in Operation and Maintenance Manuals when need for additional data becomes apparent during instruction.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 017836

WARRANTIES

PART 1 GENERAL

1.1 ROOF MATERIAL MANUFACTURER'S COMPONENT APPROVAL LETTER

- A. Prior to approval of submittals, the Contractor shall provide a letter from the intended primary roofing material manufacturer on the letterhead of the manufacturer utilizing the text and language on the attached sample entitled "Roofing Material Manufacturer's Letterhead" stipulating that all proposed component materials are approved by the manufacturer for use in its roofing assemblies and making the other representations contained therein. The letter, or an approved equal, must stipulate that the manufacturer will execute a 10 year NDL warranty on the roof system specified.

1.2 ONE YEAR CONTRACTOR'S WARRANTY

- A. Upon completion of the job and prior to final payment, the Contractor shall furnish a **one (1) Year** warranty to the Owner on the form provided herein.

1.3 MANUFACTURER'S MATERIAL AND LABOR SYSTEM WARRANTY

- A. A **Ten (10) Year** roofing material manufacturer's material and labor **"No Dollar Limit (NDL)"** system warranty will be required on this job. The roofing material manufacturer shall execute the warranty on the form included in these documents.

1.4 SHEET METAL FINISH WARRANTY

- A. A **Twenty (10) Year** warranty from the manufacturer of the sheet metal against chipping, flaking, peeling, fading, or corrosion of the finish.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 031000
CONCRETE FORMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Formwork for cast-in-place concrete including shoring, bracing and anchorage.
- B. Openings for other Work.
- C. Release agents and other related form accessories.
- D. Form stripping.

1.2 RELATED SECTION

- A. Section 032000 - Concrete Reinforcement
- B. Section 033000 - Cast-In-Place Concrete

1.3 REFERENCES

- A. American Concrete Institute (ACI):
 - 1. 347, Recommended Practice for Concrete Formwork.

1.4 DEFINITIONS

- A. Concealed: For Work required under this Section, the term "concealed" will mean "not exposed to view in finished construction."
- B. Exposed: For Work required under this Section, the term "exposed" will mean "exposed to view in finished construction."

1.5 QUALITY ASSURANCE

- A. Grading Rules. Rules of the following associations apply to materials furnished under this Section:
 - 1. Southern Pine Inspection Bureau (SPIB).
 - 2. Western Wood Products Association (WWPA).
- B. Tolerances: Follow ACI 301 (Table 4.3.1).

1.6 DELIVERY, STORAGE AND HANDLING

- A. Store off ground in ventilated and protected manner to prevent deterioration from moisture.

1.7 DESIGN CRITERIA

- A. Design, engineering, fabrication, erection, maintenance and removal of formwork shall be responsibility of Contractor.
- B. Construct forms following ACI 318, ACI 347, OSHA, state and local requirements.
- C. Provide forms with sufficient strength to withstand pressures resulting from concrete placement and vibration.
- D. Responsibility for properly bracing and shoring to support subsequent construction loads rests solely with Contractor.
- E. Responsibility for removal of forms at any time before concrete has obtained certified specified design strength rests solely with Contractor.
- F. The Engineer's efforts are aimed at designing a project which will be safe after full completion. The Engineer has no expertise in, and takes no responsibility for, construction means and methods or job Site safety during construction which are exclusively Contractor's responsibility. Processing and/or approving submittals made by Contractor which may contain information related to construction methods or safety issues, or participation in meetings where such issues might be discussed must not be construed as voluntary assumption by Engineer of any responsibility for safety procedures.

PART 2 - PRODUCTS

2.1 MANUFACTURERS / PRODUCTS

- A. Use forms specified in the general notes of the structural drawings. Provide in largest practical sizes to minimize number of required joints.

2.2 MATERIALS

- A. Wood Form Materials:
 - 1. Reference general structural notes in sheet S1.1 for wood grade requirements.
- B. Preformed Steel Forms: Minimum 16 gauge (0.06"/1.5mm) matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces.

- C. Form Release Agent: Colorless chemical form coating or mineral oil which will not stain concrete or absorb moisture.
- D. Form Ties: Standard coil or snap galvanized adjustable ties with 3/4" diameter plastic cones on exposed surfaces. Provide manufacturer's recessed plugs of gray plastic or concrete to seal tie holes.
- E. Nails, Spikes, Lag Bolts, Through Bolts and Anchorages: Sizes required; of sufficient strength and character to maintain formwork in place while placing concrete.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify lines, levels and centers before proceeding with formwork.
- B. Verify that dimensions agree with drawings.

3.2 ERECTION / INSTALLATION / APPLICATION

- A. Follow ACI 301 and 347.
- B. Provide forms as follows:
 - 1. Concealed Surfaces: Rough or board form finish left by clean, straight formed lumber.
 - 2. Exposed Surfaces (Typical): Hardboard or plywood lined concrete forms.
- C. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to over-stressing by construction loads.
- D. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping.
- E. Align joints and make watertight. Keep form joints to minimum.
- F. Obtain approval before framing openings in structural members which are not shown.
- G. Provide 1" chamfer strips in exposed exterior corners of beams, girders, columns, walls or foundation forms, around tops of all foundation slabs and elsewhere shown.
- H. Provide temporary ports or openings in formwork required for cleaning out debris, adjusting reinforcing steel and to facilitate inspection.
- I. Coordinate with Work of other Sections which require attachment of components to formwork.
- J. Coat forms with non-staining form release agent. No other coating will be permitted unless specifically approved by Architect.
- K. Inserts, Embedded Parts and Openings:

1. Provide formed openings required for items to be embedded in or passing through concrete Work.
 2. Locate and set in place items which will be cast directly into concrete.
 3. Coordinate with Work of other Sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, collars, thimbles, ties, sockets, nailing blocks, other inserts and components of other Work.
 4. Obtain required setting information before proceeding.
- L. Install accessories following manufacturer's instructions, straight, level and plumb. Ensure items are not disturbed during concrete placement.
- M. Form Removal:
1. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.
 2. Loosen forms carefully. Do not wedge pry bars, hammers or tools against exposed concrete surfaces.
 3. Store removed forms in manner that surfaces to be in contact with fresh concrete will not be damaged. Discard damaged forms.
- N. Do not construct any masonry walls on concrete floors or walls until concrete has attained its design strength and forms and shoring have been removed.
- O. Terminate embedded form ties 1-1/2" from formed face of concrete. Construct ties so that ends and fasteners can be removed without causing spalling of face of concrete.
- P. Repair form tie holes as follows:
1. Below Grade Surfaces: Fill tie holes with waterproof bituminous mastic to prevent water infiltration.
 2. Above Grade Surfaces - Concealed: Fill tie holes with compatible materials flush with adjacent concrete.
 3. Above Grade Surfaces - Exposed: Fill tie holes with compatible materials flush with adjacent concrete. Repairs shall blend in inconspicuously with surrounding surfaces. Follow Section 033000.
- Q. Finishes. Follow ACI 301 unless specifically shown otherwise.

3.3 TOLERANCES

- A. Formwork: Follow ACI 301.

3.4 FIELD QUALITY CONTROL

- A. Inspect erected formwork, shoring and bracing to ensure that Work follows formwork design and that supports, fastenings, wedges, ties and items are secure.

3.5 ADJUSTING AND CLEANING

- A. Clean forms as erection proceeds to remove foreign matter within forms.
- B. Clean formed cavities of debris prior to placing concrete.
- C. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.

END OF SECTION

SECTION 032000
CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Reinforcing steel, welded wire fabric, tie wires and other related accessories.
- B. Work includes reinforcing for interior and exterior cast-in-place concrete and reinforced concrete unit masonry Work.

1.2 RELATED SECTIONS

- A. Section 033000 - Cast-In-Place Concrete
- B. ~~Section 042200 - Concrete Masonry Units~~

1.3 REFERENCES

- A. American Concrete Institute (ACI):
 - 1. 301, Structural Concrete.
 - 2. 315, Manual of Standard Practice for Detailing Reinforced Concrete Structures.
 - 3. 318, Building Code Requirements for Reinforced Concrete.
- B. American Society for Testing and Materials (ASTM):
 - 1. A82, Cold Drawn Steel Wire for Concrete Reinforcement.
 - 2. A185, Welded Steel Wire Fabric for Concrete Reinforcement.
 - 3. A615, Deformed and Plain Billet Steel Bars for Concrete Reinforcement (including supplementary requirements)
- C. Concrete Reinforcing Steel Institute (CRSI):
 - 1. Manual of Practice.
 - 2. 63, Recommended Practice For Placing Reinforcing Bars.
 - 3. 65, Recommended Practice for Placing Bar Supports, Specifications and Nomenclature.

1.4 SUBMITTALS

- A. Submit:
 - 1. Shop drawings. Provide electronic (PDF) copies of each drawing.

- a. Show reinforcing steel and wire fabric sizes, spacings, locations and quantities, bending and cutting schedules and supporting and spacing devices.
 - b. Indicate visual method of identification of bar strengths following ASTM standard for steel type used.
- 2. Certified copies of mill test reports of reinforcement materials analysis (upon request).
- B. Provide submittals within 30 days after Contract date.

1.5 QUALITY ASSURANCE

- A. Maintain 1 copy of each referenced document at Site.
- B. Fabrication and Placement Tolerances: Follow ACI 301.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver to Site free of rust and scale, clearly marked as to bar strength.
- B. Store reinforcing materials on pallets or other materials off ground. Avoid surface contamination before placement and prevent bending or warping.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Reinforcing Steel: ASTM A615, Grade 60 (60,000 psi yield strength) billet steel bars; epoxy coated. Provide in sizes shown on plans provide deformed bars typically and plain bars where dowels are shown.
- B. Stirrup Steel: #3 reinforcing bars may by ASTM A615 Grade 40.
- C. Welded Wire Fabric (WWF): ASTM A185, plain type; unfinished. Provide in sheet form not in rolls. Provide as sized if shown or as follows if not shown:
 - 1. Provide 1 layer of 6 x 6-W2.9 x W2.9 in sidewalk and toppings 4" or less in thickness.

2.2 ACCESSORIES

- A. Tie Wire: Minimum 16 gauge (0.06") annealed type.
- B. Chairs, Bolsters, Bar Supports and Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions.
- C. Special Chairs, Bolsters, Bar Supports and Spacers Adjacent to Weather Exposed Concrete Surfaces: Stainless steel type; sizes and shapes required.

2.3 FABRICATION

- A. Fabrication: Follow CRSI Manual of Practice.
- B. Locate reinforcing splices not shown at points of minimum stress.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Foundations and Footings:
 - 1. Clean excavations of loose debris and earth. Cut sides of excavations square and remove loose material.
 - 2. Pump out standing water from excavations before placing reinforcement. Remove and replace mud or frozen soil with lean concrete.
- B. Clean reinforcement completely before concrete placing. Reinforcement shall be free from loose, flaky rust, mud, oil or other coatings that would destroy or reduce bond with concrete at time concrete is placed. Reinspect reinforcement and clean off any dried cement, mortar or dirt when placement is delayed.
- C. Obtain Owner's Engineer's approval of reinforcement installations prior to placement of any concrete.

3.2 ERECTION / INSTALLATION / APPLICATION

- A. Position reinforcement following ACI 301, ACI 315 and drawn details.
- B. Provide reinforcing steel in concrete footings, foundation walls, thickened slabs, retaining walls and elsewhere shown.
- C. Provide reinforcing steel in concrete unit masonry walls, bond beams and elsewhere shown.
- D. Provide corner reinforcing steel in footings at corners and at intersections of walls unless shown otherwise:
 - 1. Bar size and spacing shall match wall or footing reinforcing.
 - 2. Return bars minimum of 36 diameters on each end.
 - 3. WELDING OF REINFORCING IS NOT PERMITTED.
- E. Provide the following minimum concrete cover requirements for reinforcing steel unless shown otherwise:
 - 1. Concrete Cast Against and Permanently Exposed to Earth: 3".
 - 2. Concrete Exposed to Earth or Weather:
 - a. #5 Bars and Smaller: 1-1/2".
 - b. Others: 2".

- F. Provide minimum splice requirements for reinforcing steel shown or required by ACI 318. Stagger splices so that no more than 1/2 of horizontal reinforcing steel is spliced at any given cross section.
- G. Provide a bond breaker such as plastic sleeves at all dowel bars occurring at control and expansion joints.
- H. Place, support and secure reinforcement against displacement. Do not deviate from required position.
 - 1. Provide bolsters and chairs required to maintain reinforcing steel at proper elevation in slab.
- I. Lap welded wire fabric minimum 6" or 1 full mesh on sides and 1 foot or 2 full meshes on ends and extend to within 2" of slab edges. Chair support welded wire fabric so that welded wire fabric is in upper half of slab while placing slabs on grade unless specifically shown otherwise.
- J. Carry welded wire fabric and reinforcing steel through control (contraction) joints but not through construction and expansion joints unless shown otherwise.
 - 1. Grease dowels thoroughly and paper wrap to allow for horizontal movement at expansion joints.
 - 2. Cut alternate wires of welded wire fabric at control joints.
- K. Take care to avoid disturbing reinforcement and vapor retarder during placing of concrete. Remove and reinstall disturbed or improperly installed reinforcement when discovered or instructed by Owner's Engineer before continuing concrete placement.
- L. Accommodate placement of formed openings.

END OF SECTION

SECTION 033000
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Interior and exterior plain and reinforced site-placed concrete, vapor retarders, expansion joints, curing compounds and other related accessories.

1.2 PRODUCTS INSTALLED BUT NOT FURNISHED UNDER THIS SECTION

- A. Masonry Wall Dowels.

1.3 RELATED SECTIONS

- A. Section 032000 - Concrete Reinforcement
- B. ~~Section 042200—Concrete Masonry Units~~

1.4 REFERENCES

- A. American Concrete Institute (ACI):
 - 1. 301, Structural Concrete.
 - 2. 302, Guide for Concrete Floor and Slab Construction.
 - 3. 304, Measuring, Mixing, Transporting and Placing Concrete.
 - 4. 305R, Hot Weather Concreting.
 - 5. 308, Curing Concrete.
 - 6. 309, Recommended Practice for Consolidation of Concrete.
 - 7. 318, Building Code Requirements for Reinforced Concrete.
- B. American Society for Testing and Materials (ASTM):
 - 1. C31, Making and Curing Concrete Test Specimens in the Field.
 - 2. C33, Concrete Aggregates.
 - 3. C39, Compressive Strength of Cylindrical Concrete Specimens.
 - 4. C94, Ready Mixed Concrete.
 - 5. C143, Test Method for Slump of Portland Cement Concrete.
 - 6. C150, Portland Cement.
 - 7. C171, Sheet Materials for Curing Concrete.
 - 8. C172, Sampling Freshly Mixed Concrete.
 - 9. C231, Air Content of Freshly Mixed Concrete by the Pressure Method.
 - 10. C260, Air Entraining Admixtures for Concrete.
 - 11. C309, Liquid Membrane - Forming Compounds for Curing Concrete.

12. C494, Chemical Admixtures for Concrete.
13. C618, Fly Ash and Raw or Calcinated Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.

1.5 DEFINITIONS

- A. Concealed: For Work required under this Section, the term "concealed" will mean "not exposed to view in finished construction."
- B. Exposed: For Work required under this Section, the term "exposed" will mean "exposed to view in finished construction."

1.6 SUBMITTALS

- A. Submit: Provide electronic (PDF) copies of all required submittal information.
 1. Concrete mix designs. Follow ACI 301. Submit a mix design for each class of concrete required within 30 days after Contract date and prior to placing any concrete.
 2. Product data including installation requirements for curing/sealer compounds, mineral and chemical admixtures and joint devices.
 3. Concrete delivery tickets.
 - a. Submit to Owner's Engineer at Site.
 - b. Follow ASTM C94. Also include:
 - 1) Batch number.
 - 2) Mix by class of concrete and bag content with maximum aggregate size used
 - 3) Air content.
 - 4) Quantities and types of admixtures.
 - 5) Slump.
 - 6) Time of loading.
 - c. Delivery tickets not showing time of loading will be grounds for rejection of load.
 4. Testing laboratory reports.
 - a. Submit directly to Owner's Engineer, Contractor and ready-mix supplier.
 5. Certification or test results indicating compliance of material or source of material with these specifications (upon request).

1.7 QUALITY ASSURANCE

- A. Maintain 1 copy of each referenced document at Site.
- B. Acquire cement and aggregate from same source for all Work.

- C. Tolerances: Place and finish cast-in-place concrete within tolerance limits specified in ACI 301 and as follows:
 - 1. Formed Surfaces: Follow ACI 301 (Table 4.3.1.)
- D. Acceptance of Work: Presence or evidence of nonconforming Work shall be sufficient cause for Owner's Engineer to require entire section of concrete affected be torn out and rebuilt properly at Contractor's expense.
 - 1. Such unacceptable Work includes:
 - a. Horizontal or vertical misalignment.
 - b. Cracking.
 - c. Honeycombing.
 - d. Spalling.
 - e. Embedded debris.
 - 2. If by tests or on-site observation, Owner's Engineer determines that any of Contract requirements have not been fully met in completion of this Work, he may require additional testing or retesting to determine composition, soundness and actual structural capacity of any concrete.
 - 3. Costs for such testing shall be paid by Contractor if such tests subsequently establish that Work is unacceptable and by Owner if Work is found to be acceptable.
 - 4. Remove and replace all unacceptable Work including related Work which was acceptable but which must be disturbed as a result of replacement if such tests establish that Work is unacceptable with regard to compliance with these specifications.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Concrete Delivery: Follow ACI 304 and ASTM C94.
- B. Deliver packaged materials in manufacturer's unopened, labeled containers.
- C. Store materials to provide protection from weather and damage.
- D. Deliver concrete in agitating or revolving type equipment. DO NOT USE NON-AGITATING EQUIPMENT.
- E. Discharge concrete at Site within 1-1/2 hours or 300 revolutions, whichever comes first, after water has been added to cement and aggregates or cement batches with aggregates unless a longer time is specifically authorized by Owner's Engineer.
- F. Owner's Engineer may require a reduction in this elapsed time during hot weather, when high early strength cement is being used or under other conditions contributing to quick stiffening of concrete.

1.9 PROJECT CONDITIONS

- A. Coordinate Work of other trades who will furnish and install items of Work (sleeves, piping, conduit, inserts, etc.) to be cast in concrete. Place no concrete until such items are in place.

- B. Place concrete at ambient temperatures between 50°F and 95°F.
- C. Follow instructions for special procedures at end of this Section should it be necessary to place concrete in colder or hotter weather.
- D. Protect freshly placed concrete from rainfall, water leaks, falling objects, traffic of any kind and other hazards to surfaces. Provide barricades and lights if necessary.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Portland Cement:
 - 1. ASTM C150 Type II (Moderate).
 - 2. Cement shall be free of false set when tested following ASTM C451.
 - 3. Use same brand, type and source throughout.
- B. Aggregates:
 - 1. Fine Aggregate: ASTM C33; natural or manufactured sand, clean, hard and durable, uncoated grains, free from deleterious matter. Average fineness modulus shall be between 2.5 and 3.0.
 - 2. Coarse Aggregate: ACI 301 and ASTM C33.
 - a. Interior and Concealed Exterior Applications: Crushed gravel or stone, durable uncoated particles free from deleterious matter.
 - b. Exposed Exterior Applications: Crushed dolomite, granite or limestone.
 - c. Grading: ASTM C33 No. 57. Exception: Use grade size No. 8 masonry core fill.
- C. Admixtures:
 - 1. Mineral Admixtures:
 - a. Fly Ash: ASTM C618 Class C or Class F; maximum 25% fly ash may be used as a cement substitute; maximum 6% loss on ignition.
 - b. Fly ash source must be approved by Owner's Engineer. Preapproved sources are:
 - 1) Class C: Boral Manufacturing
 - 2. Chemical Admixtures:
 - a. Air Entraining Admixtures: ASTM C260.
 - b. Water Reducing Admixtures: ASTM C494 Type A (Water Reducing).
 - 1) Type E (Water Reducing and Accelerating) may be used during cold weather and Type D (Water Reducing and Retarding) during hot weather with Engineer's prior approval.

- 2) Type F (Water Reducing - High Range) or Type G (Water Reducing High Range and Retarding) admixtures (superplasticizers) may be used with Engineer's prior approval.
- c. Calcium chloride, thiocyanates, corrosive admixtures or admixtures containing more than 0.05% chloride ions (total) are not permitted.
3. DO NOT USE ANY OTHER ADMIXTURES WITHOUT AEPSC'S PRIOR WRITTEN APPROVAL.
- D. Water: Potable; free from objectionable quantities of foreign materials harmful to concrete such as silt, organic matter, acids, alkali, salt and other deleterious substances.
- E. Vapor Retarders: Clear or black fungus resistant polyethylene or fabric reinforced plastic film recommended for below grade application; 10 mil thick.
- F. Expansion Joint Filler Strips: ASTM D1751 non-extruding and resilient type, asphalt impregnated fiberboard or felt or ASTM D1752 closed cell foam with resiliency recovery of 95% if not compressed more than 50% of original thickness; 3/8" thick for interior and 1/2" thick for exterior unless shown otherwise.
- G. Liquid Curing/Sealer Compound (Typical): ASTM C309 Type 1; approved by Asphalt and Vinyl Composition Tile Institute; 30% minimum solids content.
- H. Sheet Curing Membranes: ASTM C171; absorptive mats, waterproof paper or polyethylene film.

2.2 CONCRETE MIXES

- A. General Requirements:
 1. Concrete Mixing: Follow ASTM C94. BATCH MIXING OF CONCRETE ON SITE IS NOT PERMITTED EXCEPT FOR MISCELLANEOUS MIXES.
 2. Mixing Procedures: Follow ACI 301.
 3. Handling and Weighing: Follow ACI 304.
 4. Measure water, air entraining admixtures and water reducing admixtures by weight or volume. Measure all other materials by weight.
 5. Provide admixtures for entrainment in concrete Work subject to vehicle abrasion or freeze - thaw cycles either during construction or afterwards. AIR ENTRAINED CEMENT IS NOT ACCEPTABLE.
 6. Provide water reducing admixtures in all Classes of concrete Work.
 7. No dry-packaged mixtures are allowed.
 8. Provide fly ash as supplementary cementitious material in concrete Work. Fly ash content shall not exceed 25% of the cementitious material weight within a concrete batch.
 9. Exposed concrete is to meet requirements for potentially destructive exposure.
 10. Admixtures are to be added at batch plant.
 11. Do not add water to mix on job unless previously approved by Owner's Engineer. Note amount of water added on delivery ticket.
 12. Nominal maximum allowable slump of concrete (except for controlled density fill) is 4".
 13. Follow Exhibit 033000 for water/cementitious ratio of concrete.

14. Provide minimum 3 day compressive strength of 1800 psi for concrete used for floors.

B. Concrete Properties and Proportions:

1. Provide concrete meeting the following properties and performance specifications

a. Structural Concrete (Class 1)

F'c	4,000 psi (28-day compressive strength)
Portland Cement	ASTM C 150 Type II
Fly Ash	Class C, ASTM C 618 (Maximum of 23% of cementitious material)
Water/Cementitious Material Ratio	0.50 Maximum
Slump	5" (+/- 1") measured from the discharge of the truck, for all concrete unless noted otherwise; 7" (+/- 1") for piers
Coarse Aggregate	1" maximum with gradation requirements prescribed in Table 2 of ASTM C33 Size No. 57.
Air Entrainment	Air entrainment shall not be used for concrete with exposed steel troweled surfaces
Total Air Content	3% Maximum (by volume)
Concrete Temperature	95°F Maximum

b. CMU Grout Fill (Class 2)

F'c	3,000 psi (28-day compressive strength)
Portland Cement	ASTM C 150 Type II
Fly Ash	Class C, ASTM C 618 (Maximum of 25% of cementitious material)
Slump	8" to 11" measured from the discharge of the truck
Coarse Aggregate	3/8" maximum with gradation requirements prescribed in Table 2 of ASTM C33 Size No. 8

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine Site conditions and excavations for earth forms to verify that they are neatly and accurately cut and correctly located.
- B. Examine formwork to verify that it is sound and correctly located, that conditions are proper for concrete installation and that excavations are sufficient to permit placement, inspection and removal of forms.
- C. Examine reinforcement to verify requirements for concrete cover.
- D. Examine areas of Work to be cast to determine that substrates are properly installed, required reinforcement, inserts and embedded items are in place and that correct finish top of cast elevations can be obtained.

1. Verify that conduit and piping is installed below slab. NO UTILITIES ARE TO BE BUILT INTO SLAB OR TOPPING.
 2. Verify depths of depressed conditions are correct for specified delayed finishes. Slabs to receive finishes over 1/8" in thickness shall be depressed as required to allow for alignment with adjacent finish materials.
 3. Verify base and sub-base slope correctly at floor drains. Slab thickness shall be maintained in sloped areas.
- E. Do not start Work until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Ensure availability of sufficient labor, equipment and materials to place concrete correctly following Project requirements and scheduled casting.
- B. Notify Owner's Engineer at least 48 hours in advance of placing any concrete. Place concrete only when Owner's Engineer is present unless this requirement is specifically waived. Excavations must be inspected and approved by soils engineer.
- C. Place no concrete before embedded items are in place and before forms, reinforcing and affected Work of other trades have been examined.
1. Coordinate placement of joint devices with erection of formwork and placement of form accessories.
- D. Drill holes in previously poured concrete, insert steel dowels and pack solid with non-shrink grout in locations where new concrete is dowelled to existing Work including at bases and pads.
- E. Immediately Before Placing Concrete:
1. Clean debris from forms, decks, base slabs, bottoms of forms, etc. to receive concrete.
 2. Thoroughly wet base of slabs poured directly on earth, sand, stone, concrete or gravel.
 3. Verify sizes and locations of openings required.
 4. Secure approval of conditions from Owner's Engineer. Allow a minimum of 1 hour for Owner's Engineer's inspection after installation of reinforcing and before placing concrete.

3.3 ERECTION / INSTALLATION /APPLICATION

- A. Follow ACI 301.
- B. Place concrete only when Owner's Engineer is present unless this requirement is specifically waived by Owner's Engineer upon notice of scheduled pour.
- C. Notify Owner's Engineer not less than 48 hours (excluding holidays and weekends) in advance of placing concrete.
- D. Provide concrete of following various classes unless shown otherwise.
1. Class 1: Structural Concrete

2. Class 2: CMU Grout Fill
- E. Provide uniform slope at rate shown on structural foundation plans. Exterior walkways shall slope as indicated on Architectural plans.
- F. Install vapor retarder under interior and exterior slabs, walks, bases and pads on grade.
1. Lay film directly on slab base just before setting reinforcing and pouring concrete slabs. Provide widest widths practical and oriented to obtain least lineal footage of joint.
 2. Lap and seal joints. Lap film a minimum of 6" at joints with top lap placed in direction of spreading of concrete. Seal joints watertight by taping or applying sealant at overlapping edges and ends.
 3. Carry film up walls, columns, etc. and secure in place with cement or tape. Fold and cement corners or otherwise make vaporproof.
 4. Provide sealed contact with piping and other penetrating items. Cut film carefully around opening for pipes, ducts, conduit, wiring, etc. Tape film to insure maximum barrier effectiveness.
 5. Exercise care so that film is not punctured. Seal joints, cuts, punctures, etc. with tape, cement or hot iron.
 6. Trim exposed film at floor line after concrete has cured and hardened.
 7. Repair vapor retarder damaged during placement of concrete reinforcing.
- G. Provide sufficient workmen to allow for placement of concrete and other operations within time limits required in Article 1.07 herein.
- H. Keep delivery carts and buggies on runways. Do not allow them to bear on reinforcing or uncured concrete.
- I. Deposit concrete within 6 feet of its final location to avoid segregation due to rehandling or flowing. Do not drop concrete freely where reinforcing will cause segregation. Chuting procedure is subject to approval of Owner's Engineer. Maximum allowable drop is 5 feet. SPREADING WITH VIBRATORS IS PROHIBITED.
- J. Place concrete quickly and vibrate thoroughly with a vibratory screed or other device approved by Owner's Engineer. Maintain specified position of mesh and reinforcement. Follow ACI 309 for use and type of vibrators.
- K. Deposit concrete continuously, or when continuous placement is not possible, provide construction joints at locations approved by Owner's Engineer.
- L. Do not deposit partially set concrete, retempered concrete or any concrete failing slump or air content tests.
- M. Consolidate concrete by internal vibration to maximum practical density so that it is free from pockets of coarse aggregate and trapped air, fits tightly against subgrades, forms and embedded items and leaves smooth, dense surfaces.
- N. Operate vibrators using experienced workers and where possible use same operators throughout Project. DO NOT USE VIBRATORS AGAINST FORMS OR REINFORCEMENT.

- O. Finishes: Follow ACI 301 (Chapter 11). Perform finishing using only experienced, skilled workers.
1. Flatwork:
 - a. Slab finish shall be as noted on structural foundation plans. Reference structural general notes for flatness requirements pertaining to surface finish.
 - b. Detectable Warning Finish: For exterior handicapped curb cuts (ramp only not on flared sides), textured or imprinted concrete using rollers or aluminum tools to produce 0.9" diameter x 0.2" high (nominal) truncated domes at 2.35" on center following requirements of Americans With Disabilities Act (ADA).
 2. Vertical and Miscellaneous Work:
 - a. Exposed Surfaces: Smooth, Do Not Rub Cement Paste on Exposed Concrete Surfaces.
 - b. Concealed Surfaces: Rough form finish.
- P. Control (Contraction) Joints:
1. General Requirements:
 - a. Provide joints in walks, pads, slabs and toppings shown or specified.
 - b. Make joints approximately 1/8" wide and minimum depth of 1/4 slab thickness.
 - c. Locate as shown or as follows if not shown. Verify final locations with Owner's Engineer before proceeding.
 2. Interior Locations:
 - a. Provide sawed control joints where shown or at maximum 20 feet on center in each direction in slabs and toppings if not shown.
 - b. Install sawed joints immediately after final finishing to depth of 1/4 slab thickness with Soff-Cut saw.
 - c. Saw control joints 1/8" wide unless otherwise approved. A construction joint may be located where sawed joint is required.
- Q. Curing and Protection: Follow ACI 308.
1. Prevent excessive moisture loss from formed surfaces. Cure formed surfaces by moist-curing or application of curing compound for remainder of curing period if forms are removed before 7 days have elapsed.
 2. Provide 1 application of liquid curing/sealer compound immediately after finishing of concrete on interior and exterior concrete slabs.
 - a. Exception #1: Floors scheduled to receive ceramic tile and quarry tile shall be sheet membrane/water (moist) cured for minimum of 10 days.
 - 1) Begin water curing as soon as concrete has hardened sufficiently to prevent damage from water or cover material.

- 2) Water curing shall consist of ponding or with sprinkling, spraying or covering with wet burlap, sand or waterproof barrier such as polyethylene or building paper.
- 3) Maintain 100% coverage continuously over water cured slabs for minimum of 4 days for ponding and for 7 days for spraying and membrane curing.

3.4 FIELD QUALITY CONTROL

- A. Test and inspect materials and operations as Work progresses. Failure to detect defective Work shall not prevent rejection when defect is discovered nor shall it obligate Owner for final acceptance.
- B. Costs for any retesting resulting from Work found to be in non-compliance shall be paid for by Contractor.
- C. Strength: ASTM C31, C39 and C172.
 1. Conduct strength tests of all classes of concrete (except miscellaneous mixes).
 2. Secure composite samples following ASTM C172. For strength tests, a sample shall be obtained from same batch of concrete on a representative, random basis. A sample consists of six specimens.
 3. Mold and cure each sample following ASTM C31.
 4. Test 1 specimen at 7 days, test 2 specimens at 28 days and 1 specimen at 56 days following ASTM C39. Results shall be average of strengths of 2 specimens, except that if 1 specimen in a test manifests evidence of improper sampling, molding or testing, it shall be discarded.
 5. Record exact location of Work represented by each sample on test reports.
 6. Provide a sample for each amount or fraction thereof of each class of concrete placed each day as follows:
 - a. 0-100 Cubic Yards: 1 Sampling of 4 Cylinders.
- D. Air Content: ASTM C231.
- E. Slump: ASTM C143.

3.5 ADJUSTING AND CLEANING

- A. Provide materials, methods and finishes for cleaning, patching and other repairs consistent with similar concrete Work in place, approved by Owner's Engineer before beginning repair Work and performed at Contractor's expense.
- B. Repair any slabs which do not meet finish requirements performing all grinding, filling of cracks or patching and leveling procedures as required. Replace slabs which cannot be successfully repaired.
- C. Point carefully around piping, conduit and other penetrations on both interior and exterior surfaces.

- D. Obtain Owner's Engineer prior approval of any corrective measures for slabs which are dusting or showing other signs of improper curing. These may include additional applications of sealer or hardener, grinding or covering with coating or topping.
- E. Remove from interior and exterior exposed surfaces any stain-producing elements such as pyrites, nails, wire, reinforcing steel and form ties immediately prior to final acceptance.
- F. Remove stains completely. Use of weak acids or patented cleaners is acceptable but surface is to be completely neutralized after use.
- G. Blend in surfaces of exposed repairs inconspicuously with surrounding surfaces.

3.6 PROTECTION

- A. Protect newly placed concrete from weather and construction traffic damage.

3.7 SPECIAL PROCEDURES

- A. It is Project intent to continue concrete Work required to keep Project on schedule throughout summer and winter.
- B. Hot Weather Concreting:
 - 1. Follow ACI 305R.
 - 2. Obtain approval to use a retarder in concrete.
 - 3. Temperature of concrete shall not exceed 95°F.
 - 4. Cool water and aggregate to lower temperature of concrete.
 - 5. Cool subgrade and forms by sprinklering with water immediately before placing.
 - 6. Schedule trucks to reduce waiting time at Site.
 - 7. Cure immediately after finishing.
- C. Replace any concrete injured or destroyed by reason of freezing, hot or cold weather at Contractor's own expense including cost of replacing any Work embedded in concrete.

END OF SECTION

SECTION 033543

POLISHED CONCRETE FINISHING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes polished concrete finishing and scoring.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each type of product requiring color selection.

1.3 QUALITY ASSURANCE

- A. Field Sample Panels: After approval of samples, produce field sample panels to demonstrate the approved range of selections made under Sample submittals. Produce a minimum of three sets of full-scale panels, approximately 48 by 48 inches minimum, to demonstrate the expected range of finish, color, and appearance variations.
 - 1. Locate panels as indicated or, if not indicated, as directed by Architect.
 - 2. Maintain field sample panels during construction in an undisturbed condition as a standard for judging the completed Work.
 - 3. Demolish and remove field sample panels when directed.

PART 2 - PRODUCTS

2.1 LIQUID FLOOR TREATMENTS

- A. Penetrating Liquid Floor Treatments for Polished Concrete Finish: Clear, waterborne solution of inorganic silicate or silicate materials and proprietary components; odorless; that penetrates, hardens, and is suitable for polished concrete surfaces.
 - 1. Euclid: Euco Diamond Hard
 - 2. Approved equal (refer to substitution specification)

PART 3 - EXECUTION

3.1 POLISHING

- A. Polish: Level 3: High sheen, 800 grit
- B. Aggregate Exposure: Class B, fine aggregate (salt & pepper)
- C. Apply polished concrete finish system to cured and prepared slabs.
 - 1. Machine grind floor surfaces to receive polished finishes level and smooth.
 - 2. Apply penetrating liquid floor treatment for polished concrete in polishing sequence and according to manufacturer's written instructions, allowing recommended drying time between successive coats.
 - 3. Continue polishing with progressively finer-grit diamond polishing pads to gloss level, to match approved mockup.
 - 4. Control and dispose of waste products produced by grinding and polishing operations.
 - 5. Neutralize and clean polished floor surfaces.

END OF SECTION

SECTION 061000
ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUBMITTALS

- A. Product data for engineered wood products, insulating sheathing, underlayment, metal framing anchors, and construction adhesives.
- B. Provide electronic (PDF) copies of all required submittal information.

PART 2 - PART 2 PRODUCTS

2.1 LUMBER, GENERAL

- A. Furnish grade stamped lumber that is dressed S4S and complies with PS 20 and applicable grading rules of inspection agencies certified by ALSC's Board of Review.
 - 1. Provide seasoned lumber with 19 percent moisture content at time of dressing and shipment, for sizes 2 inches or less in thickness.
 - 2. For exposed lumber, apply grade stamps to ends or back of each piece or omit grade stamps entirely and issue certificate of grade compliance.

2.2 DIMENSION LUMBER

- A. Provide lumber of the following product classification in grade and species indicated:
- B.

1. Plates	Southern Yellow Pine	No. 2	SPIB
2. Posts	Southern Yellow Pine	No. 2	SPIB
3. Rafters/Headers	Southern Yellow Pine	No. 2	SPIB

2.3 LUMBER FOR MISCELLANEOUS USES

- A. Unless otherwise indicated, provide "No. 2" grade light-framing-size lumber of any species for support of other construction, including rooftop equipment and support bases, cant strips, bucks, nailers, blocking, furring, grounds, stripping and similar members.

2.4 FASTENERS

- A. Of size and type indicated that comply with the following requirements. Where rough carpentry is exposed to weather, in ground contact, or in areas of high relative humidity, provide AISI Type 316 stainless steel fasteners.
 - 1. Nails, Wire and Brads: FS FF-N-105
 - 2. Power Driven Fasteners: National Evaluation Report NER-272.
 - 3. Wood Screws: ANSI B18.6.1.
 - 4. Lag Bolts: ANSI B18.2.1.
 - 5. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and where indicated, flat washers.

2.5 METAL FRAMING ANCHORS

- A. Provide metal framing anchors of type, size, metal, and finish indicated that comply with requirements specified including the following:
 - 1. Current Evaluation/Research Reports: Provide products for which model code evaluation/research reports exist that are acceptable to authorities having jurisdiction and that evidence compliance of metal framing anchors for application indicated with the building code in effect for this project.
 - 2. Allowable Design Loads: As published by manufacturer and determined from empirical data or by rational engineering analysis and verified through comprehensive testing by a qualified independent testing laboratory.
 - 3. All connectors shall be 316 stainless steel material.
- B. Use stainless steel fasteners for all rough carpentry.

2.6 LUMBER AND PLYWOOD TREATMENT

- A. Preservative pressure treat lumber and plywood with water-borne preservatives to comply with AWPAC2 and C9, respectively, and with requirements indicated below. Mark each treated item with the AWPB or SPIB Quality Mark Requirements.
- B. Pressure-treat above-ground items with water-borne preservatives to a minimum retention of 0.25 pcf. For interior uses, after treatment, kiln-dry lumber and plywood to a maximum moisture content, respectively, of 19 percent and 15 percent. Treat indicated items and the following:
 - 1. Wood, cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 - 2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
 - 3. Wood framing members less than 18 inches above grade.
- C. Pressure-treat wood members in contact with the ground or fresh water with water-borne preservatives to a minimum retention of 0.40 pcf.

- D. Complete fabrication of treated items prior to treatment, where possible. If cut after treatment, coat cut surfaces to comply with AWP M4. Inspect each piece of lumber or plywood after drying and discard damaged or defective pieces.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install rough carpentry work to comply with the International Building Code, 2009 edition, and the National Design Standard, and the following:
 - 1. Recommendations of engineered wood products manufacturer.
 - 2. Recommendations of manufacturer of sheathing, underlayment and other products not covered in above publications.
- B. Set rough carpentry to required levels and lines, with members plumb and true and cut to fit.
- C. Securely attach carpentry work to substrates and supporting members using fasteners of size that will not penetrate members where opposite side will be exposed to view to receive finish materials.
- D. Install fasteners without splitting wood; fasten panel products to allow for expansion at joints unless otherwise indicated.
- E. Provide wood framing members of size and spacing indicated; do not splice structural members between supports. Fire stop concealed spaces with wood blocking not less than 2 inches thick, if not blocked by other framing members.
- F. Contact Architect / Engineer for framing inspection prior to installing interior gypsum board, roofing paper or exterior vapor barrier.
- G. Fasten construction panel products as follows:
 - 1. Sheathing:
 - a. Nail to framing. Reference structural drawings for nailing schedule.

END OF SECTION

SECTION 067300
COMPOSITE DECKING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Composite Decking

1.2 RELATED SECTIONS

- A. Section 061100 – Rough Carpentry

1.3 REFERENCES

- A. ASTM D-7032-04: Standard Specification for Establishing Performance Ratings for Wood-Plastic Composite Deck Boards and Guardrail Systems (Guards or Handrails), ASTM International.
- B. ASTM D-7031-04: Standard Guide for Evaluating Mechanical and Physical Properties of Wood-Plastic Composite Products, ASTM International
- C. ASTM E-84-01: Test Method for Surface Burning Characteristics of Building Materials, ASTM International.
- D. ASTM D 570: Water Absorption of Plastics
- E. ASTM D 1761: Mechanical Fasteners in Wood
- F. ASTM D -1413-99: Test method for Wood Preservatives by Laboratory Soil-block Cultures
- G. ASTM C177: Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus

1.4 DESIGN/PERFORMANCE REQUIREMENTS

- A. Structural Performance:
 - 1. Deck: Uniform Live Load – 100 pounds per square foot.
 - 2. Tread of Stairs: Concentrated Load: 100 pounds per square foot and 1/8” max deflection with a concentrated load of 300 pounds on area of 4 sq. in.
- B. Fire-Test Response Characteristics per ASTM E-84.

1.5 SUBMITTALS

- A. Product Data Indicate sizes, profiles, surface style, and performance characteristics
- B. Product data for stainless steel deck screws with self-gapping hardware for edge-of-deck concealed fastening system.
- C. Samples: For each product specified, one sample representing actual product color, size, and finish.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products on a flat and level surface. Adjust support blocks accordingly
- B. Support bundles on supplied dunnage.

- C. When stacking bundles, supports should start approximately 8” from each end and be spaced approximately 2ft on center. Supports should line up vertically/perpendicular to the decking product.
- D. Do not stack decking more than 14 bundles.
- E. Keep material covered using the provided bundle cover until time of installation.

1.7 WARRANTY

- A. Provide manufactures warranty against rot, decay, splitting, checking, splintering, fungal damage, and termite damage for a period of 25 years for a residential installation and 10 years for a commercial installation. In addition provide Fade and Stain Warranty against food staining and fading beyond 5 Delta E (CIE units) for a period of 25 years for a residential installation and 10 years for a commercial installation.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Contract Documents are based on products supplied by the Trex Company, Inc., 160 Exeter Dr., Winchester, VA 22603.

2.2 COMPOSITE DECKING

A. Wood-Plastic Composite Lumber

1. Material Description: Composite Decking consisting of recycled Linear Low-Density Polyethylene (LLDPE) and recycled wood. The product is extruded into shapes and sizes as follows:
 - a. Trex Transcend Decking Boards; 2x6 nominal.
 - b. Lengths – 12, 16, and 20 feet
 - c. Color – To be specified by Owner from Trex’ standard list of colors.

2. Physical and Mechanical Properties as follows:

Test	Test Method	Value	
Flame spread	ASTM E 84	60(Transcend) / 85(Enhance)	
Thermal Expansion	ASTM D 1037	1.9 x 10 ⁻⁵ inch/inch/degreeF	
Moisture Absorption	ASTM D 1037	< 1%	
Screw Withdrawal	ASTM D1761	558 lbs/in	
Fungus Resistance	ASTM D1413	Rating - no decay	
Termite Resistance	AWPAE1-72	Rating = 9.6	
		Ultimate (Typical)Values *	Design Values
Compression Parallel	ASTM D198	1588 psi	540 psi
Compression Perpendicular	ASTM D143	1437 psi	540 psi
Bending Strength	ASTM D198	3280 psi	500 psi
Shear Strength	ASTM D143	1761 psi	360 psi
Modulus of Elasticity	ASTM D4761	412,000psi	200,000 psi
Modulus of Rupture	ASTM D4761	3280 psi	500 psi

* Ultimate strength values are not meant for design analysis. Design values are for temperatures up to 130F (54C)

2.2 ACCESSORIES

A. Fasteners:

1. Trex Universal Hideaway Hidden Fasteners – stainless steel

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Install according to manufacturer's installation guidelines.
- B. Cut, drill, and rout using carbide tipped blades
- C. Do not use composite wood material for structural applications

3.2 CLEANING

- A. Following cleaning recommendations as specified in manufacturer's installation guide.

END OF SECTION

SECTION 074113

STANDING SEAM ROOF PANELS

PART 1 GENERAL

1.1 SUMMARY

A. SECTION INCLUDES

1. Standing-seam aluminum metal roof panels, including underlayment, trim and accessories

2. RELATED SECTIONS

- a) Section 07 92 00 - Joint Sealants

1.2 ADMINISTRATIVE REQUIREMENTS

A. Pre-installation Meetings:

1. Schedule meeting to discuss roof project requirements, substrate conditions, manufacturer's installation instructions, and manufacturer's warranty requirements before start of work onsite.
2. Required attendees: Contractor, metal deck & roof installer, and any other subcontractors who have equipment penetrating the roof or Work that requires roof access or traffic.

1.3 SUBMITTALS

- A. Product Data: Manufacturer literature indicating product specifications, installation instructions, and standard construction details for specified products.

- B. Shop Drawings: To be prepared by metal roof system manufacturer.

1. Submit roof plan showing panel layout, profiles, components, accessories, finish colors, gutters and downspouts as applicable.
 - a) Indicate layout of roofing panels and roof panel sizes, including custom fabricated roofing panels if indicated, indicate each trim condition.
 - b) Include details of each condition of installation, including the locations and types of fasteners, sealants and accessories. Indicate locations, gauges, shapes, and methods of attachment of all panels, accessories and trim.
 - c) Indicate products/materials required for construction activities of this section not supplied by manufacturer of products of this section.
 - d) Indicate locations of field applied sealant.
 - e) Indicate locations of field worked conditions.

2. Roof Panel Attachment:

- a) Indicate attachment method compliant with TDI Product Evaluation Index RC-223
- b) Roof plan indication roof clip spacing pattern at field, corner, perimeters and where panels are to be fixed from thermal movement.

C. Samples:

- 1. Two samples each for roof panel clip, bearing plate and clip fastener.
- 2. Submit color samples for Architect's selection.
- 3. Submit sample warranties:
 - a) Manufacturer Finish Warranty
 - b) Manufacturer Weathertightness Warranty complying with this Specification
 - c) Installer Warranty

D. Certificates:

- 1. Submit roof panel manufacturer's certification that fasteners, clips, backup plates, closures, roof panels and finishes meet the specification requirements.
- 2. Submit roof panel manufacturer's certification that installer meets requirements to install roof system and is qualified to obtain required warranties.

E. Delegated Design Submittals: Submit engineering calculations indicating wind uplift pressure calculations according to local building code for project location with tested assembly RC-223 as found on TDI Product Evaluation Index.

F. Test and Evaluation Reports - Certified test results that indicate roof system meets or exceeds design and performance criteria. Testing to include:

- 1. ASTM E1592 - Manufacturers test data, signed and sealed by a registered professional engineer, substantiating that roof system will meet the allowable wind pressures using an appropriate Factor of Safety in accordance with AISI S-100.
- 2. ANSI-SPRI ES1 – Manufacturers test data, signed and sealed by a registered professional engineer substantiating that the roof edge metal will mee the allowable wind pressures per test standard referenced.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: Manual indicating requirements and recommendations, to maintain the roof system in good working condition.
- B. Warranty Documentation: Submit final warranties required in this section.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Installer Qualifications: Installer ("roofer") to perform the work of this section shall have no fewer than 5 years of successful experience with the installation of metal roof systems similar to those required for this project. The installer shall be qualified by the roof panel manufacturer for installation of manufacturer- warranted systems.

B. Field Measurements: Prior to fabrication of panels, take field measurements of structure or substrates to receive panel system. Allow for trimming panel units, where final dimensions cannot be established prior to fabrication.

C. Mock-Ups: Install a 3 panels wide, quality control area of metal roofing, for review by the Architect. The Architect shall approve the quality of installation for the roof, prior to installing additional metal panels.

1.6 DELIVERY, STORAGE AND HANDLING

A. Delivery and Acceptance Requirements: Deliver panels to jobsite properly packaged to provide protection against transportation damage. Panels too long to ship shall be site formed onto the roof by manufacturer's factory personnel using manufacturer's factory roll forming equipment.

B. Storage and Handling Requirements:

1. Exercise care in unloading, storing and erecting panels to prevent bending, warping, twisting, and surface damage.

1.7 WARRANTIES

A. Manufacturer Warranties:

1. Panel Coating: Furnish manufacturer's 40-year warranty panel coating warranty covering cracking, checking, and peeling, and 25 year warranty covering fade and chalk.

2. Metal Roof Weathertightness Warranty:

- a) Manufacturer's Single Source Weather tightness Warranty

- (1) Warranty term: 20 years commencing on date of substantial completion.

- (2) Warranty must cover: structural failure including rupturing , cracking, or puncturing. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

- (3) Warranty: Installer to provide warranty agreeing to repair or replace metal roof panels, trim, or accessories that fails due to poor workmanship or faulty installation.

3. Warranty term: 2 years commencing on date of substantial completion.

PART 2 - PRODUCTS

2.1 ROOF PANEL SYSTEM MANUFACTURES

A. Drexel Metals Inc. (888) 321-9630; DMC 200S, .040" aluminum TDI Product Evaluation RC-223

1. comply with specified TDI requirements in appearance, assembly, and performance.

B. Product Options

1. Factory-formed panel, width of 16 inches. Panels shall be symmetrical in design and shall be mechanically seamed with a field operated electric seaming machine approved by the manufacturer.
2. Minimum seam height 2 inches. Integral seam, double lock and snap together type panels are not acceptable
 - a) Minimum thickness of .040".
3. Finish: ALUMINUM SUBSTRATE
4. Roof panel system must allow individual roof panel removal and replacement from any point on the roof without damage to adjacent roof panel(s).
5. Roof panel system must be approved by manufacturer to be installed on slopes as low as 1/4":12.
6. Panels must be furnished and installed in continuous lengths from ridge to eave with no overlaps. Panels too long to ship will be manufactured on site using manufacturer's employees and equipment.
7. Manufacturer weathertightness warranty meeting requirements of this Section.

2.2 PERFORMANCE/DESIGN CRITERIA

- A. Thermal Movement: Metal Roofing system, including flashing, shall accommodate unlimited thermal movement without buckling or excess stress on the structure.
- B. Roof panel and trim attachments will be designed to satisfy the requirements of the roof design (shown in shop drawings).
- C. Maximum wind uplift capacity of roof system shall be determined using ASTM E 1592 test results, with an appropriate Factor of Safety in accordance with AISI S-100, and ANSI-SPRI ES1 for edge metal.
- D. Panel system shall be designed in accordance with the local building code and ASCE7 for project location with respect to appropriate Exposure category, Importance Factor and Factor of Safety in accordance with AISI S-100.
- E. Tested and listed by Underwriters Laboratories to comply with UL 580 for wind uplift Class PER STRUCTURAL DWGS.

2.3 ACCESSORIES

- A. Panel Clip Screw – STAINLESS STEEL #10-13x1” PHW screw required in wind uplift rating requirements and design specification for application, with corrosion-resistant coating, in length necessary to penetrate substrate minimum 3/4 inch., as supplied by roof panel manufacturer.
- B. Roof Panel Clip:
 - 1. Intermittent Clip: 22 gauge 3”x2-1/8” STAINLESS steel DMC200S, one-piece fixed clip, designed to allow roof panel thermal movement and not contact roof panel cap, as supplied by roof panel manufacturer, meeting wind uplift requirements and design criteria of this section.
- C. Trim and flashing will be of the same gauge and different finish as selected by architect, unless approved otherwise by the metal roof system manufacturer. Provide products and installation that match tested assembly that meets project requirements per ANSI-SPRI ES1.
- D. Gutters and downspouts will be fabricated from same metal and finish TO BE SELECTED BY ARCHITECT FROM MANUFACTURER’S FULL RANGE.
- E. Underlayment: ASTM D 226 Type II Underlayment installed with minimum 4" side laps and 6" end laps and fastened using 12-gauge 1-1/4" ring shank nails and 32-gauge 1-5/8" tin caps spaced 6" on center in the laps and two staggered rows 12" on center in the field.
- F. Concealed supports, angles, plates, accessories and brackets: gauge and finish as recommended, and furnished by manufacturer.
- G. Accessory Screw: Size and screw type as provided by panel manufacturer for each use, with prefinished head in color to match panels where exposed to view.
- H. Rivets: full stainless steel or aluminum, including mandrel, in size to match application.
- I. Field Sealant:
 - 1. Exposed Sealant: Color coordinated urethane or polymer sealant as supplied by panel manufacturer.
 - 2. Non-exposed Sealant: Non-curing, non-skinning, butyl tape or tube sealant as supplied by manufacturer.
- J. Sealant Tape: non-drying, 100 percent solids, high grade butyl tape, as supplied by panel manufacturer, in sizes to match application.
- K. Pipe Penetration Flashings: 20 year warranted flexible boot type, with stainless steel compression ring.

PART 3 - EXECUTION

3.1 INSTALLERS

- A. Must be certified and qualified by Manufacturer.

3.2 EXAMINATION

A. Verification of Conditions

1. Ensure surfaces are ready for panel application.
2. Inspect and ensure surfaces are free from objectionable warp, wave, and buckle before proceeding with installation of pre-formed metal roofing.
3. Ensure substrate is ready to receive metal roofing. Report items for correction and do not proceed with metal roof panel system installation until resolved.

3.3 PREPARATION

- A. Install substrate boards, hat channels, purlins, or furring channels in accordance with manufacturer's recommendations.
- B. Coordinate Work, with installation of other associated Work, to ensure quality application.
- C. Coordinate Work with installation of associated metal flashings and building walls.
- D. Coordinate Work to minimize foot traffic and construction activity on installed finished surfaces.
- E. Coordinate location of pipe penetrations to allow centering of pipe in panel.

3.4 INSTALLATION

- A. Comply with and install roofing and flashings in accordance with all details shown on manufacturer's approved shop drawings and manufacturer's product data, instructions, and installation manuals, within specified erection tolerances.
- B. Install field panels in continuous lengths, without end laps.
- C. Do not install panels damaged by shipment or handling.
- D. Install intermittent clips with bearing plates, if required, and continuous clips, if required, according to the engineered design pattern in the field, perimeter, and corner areas of the roof.
- E. Fix panels at location depicted on reviewed shop drawing(s).
- F. Allow for required panel clearance at penetrations for thermal movement.
- G. Install concealed supports, angles and brackets as furnished by manufacturer to form complete assemblies.
- H. Remove roof panel and flashing protective film prior to extended exposure to sunlight, heat, and other weather elements.
- I. Field-apply sealant tape and gun-grade sealant according to reviewed shop drawings and manufacturer's requirements for airtight, watertight installation.

- J. Ensure sealant beads and tapes are applied prior to sheet metal installation to achieve a concealed bead. Neatly trim exposed portions of sealant without damaging roof panel or flashing finish.
- K. Align pipe penetrations to occur at center of roof panel. Report and have corrected improperly- placed penetrations before proceeding with panel installation. Remove and replace roof panels which have improperly-placed penetration flashings.

3.5 CLEANING

- A. Clean exposed surfaces of work promptly after completion of installation.
- B. Clean mud, dirt, and construction-related debris from panels before panels are scratched or marred.

3.6 PROTECTION

- A. Protect Work as required to ensure roofing will be without damage at time of final completion.
- B. Do not allow excessive foot traffic over finished surfaces.
- C. Do not track mud, dirt, or construction-related debris onto panel surfaces.
- D. Replace damaged Work before final completion.

END OF SECTION

SECTION 076200

SHEET METAL FLASHING AND TRIM (FORMED METAL)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Reference wind loads and tested roof assembly for items in this section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Formed Products:
 - a. Formed roof drainage sheet metal fabrications.
 - b. Formed low-slope roof sheet metal fabrications.

1.3 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies as indicated shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Design Wind Loads: Tested per ANSI SPRI ES to resist the uplift pressures as follows which were calculated per IBC 2018 requirements for ultimate design wind speed:
 - 1. Refer to structural drawings
- C. Thermal Movements: Provide sheet metal flashing and trim that allows for thermal movements from ambient and surface temperature changes.
 - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.
 - 1. Compliance with all Performance Requirements listed above.
- B. Shop Drawings: Show fabrication and installation layouts of sheet metal flashing and trim, including plans, elevations, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work. Include the following:
 - 1. Identification of material, thickness, weight, and finish for each item and location in Project.
 - 2. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
 - 3. Details for joining, supporting, and securing sheet metal flashing and trim, including layout of fasteners, cleats, clips, and other attachments. Include pattern of seams.
 - 4. Details of termination points and assemblies, including fixed points.
 - 5. Details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction.
 - 6. Details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashings as applicable.
 - 7. Details of special conditions.
 - 8. Details of connections to adjoining work.

- 9. Detail formed flashing and trim at a scale of not less than 1-1/2 inches per 12 inches.
 - C. Samples for Initial Selection: For each type of sheet metal flashing, trim, and accessory indicated with factory-applied color finishes involving color selection.
 - D. Qualification Data: For qualified fabricator.
 - E. Warranty: Sample of special warranty.
- 1.5 QUALITY ASSURANCE
- A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.
 - B. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.
 - C. Skilled Workmen - All sheet metal work shall be fabricated and installed by fully trained, qualified sheet metal mechanics properly skilled to perform the Work in accordance with the standards set forth in these specifications. Substandard Work will be rejected.
 - D. Accepted Flashing Details - In the event field conditions make installation of a flashing detail in accordance with SMACNA or NRCA Details impractical, the Contractor shall submit a shop drawing design to the Owner for approval to fit the particular conditions present.
 - E. Reference Standards: Except as modified by the Drawings and Specifications, the following documents, or applicable portions thereof, govern the work:
 - 1. Sheet Metal and Air Conditioning Contractors National Association, Inc.(SMACNA) "Architectural Sheet Metal Manual -Sixth Edition."
 - 2. American Society for Testing and Materials (ASTM).
 - 3. National Roofing Contractors Association (NRCA), "Roofing and Waterproofing Manual", 5th edition,
 - 4. Sheet Metal Welding Code.
 - 5. ANSI SPRI ES1
- 1.6 DELIVERY, STORAGE, AND HANDLING
- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
 - B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to the extent necessary for the period of sheet metal flashing and trim installation.
- 1.7 WARRANTY
- A. Special Warranty on Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.
- B. Prefinished Aluminum Sheet Metal - Conforming to ASTM B202-92a (UNS Alloy Designation

A93003-H14 or A933004-H34), minimum thickness required to meet or exceed tested assembly required by Performance Requirements. Exposed aluminum sheet metal shall have a high-performance organic finish, thermo-cured and containing not less than 70 percent polyvinylidene fluoride resin by weight, complying with AAMA 2604. Color: As selected by Architect from manufacturer's full range.

- C. Stainless Steel Sheet Metal: ASTM A 240/A 240M, Type 304; No. 2B finish; gauge required to meet or exceed tested assembly required by Performance Requirements .

2.2 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
 - 1. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F.
 - 2. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F.
 - 3. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Carlisle Coatings & Waterproofing Inc.; CCW WIP 300HT.
 - b. Grace Construction Products, a unit of W. R. Grace & Co.; Ultra.
 - c. Henry Company; Blueskin PE200 HT.

2.3 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
 - 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
 - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating.
 - b. Blind Fasteners: Stainless-steel rivets suitable for metal being fastened.
 - c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
 - 2. Fasteners for prefinished Aluminum Sheet: Series 300 stainless steel.
 - 3. Fasteners for stainless steel sheet: Series 300 stainless steel.
- C. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, non-sag, non-toxic, non-staining tape 1/2 inch wide and 1/8 inch thick.
- D. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant; low modulus; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- E. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
- F. Epoxy Seam Sealer: Two-part, non-corrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
- G. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.
- H. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.4 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, geometry, metal thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extent possible.
 - 1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
 - 2. Obtain field measurements for accurate fit before shop fabrication.
 - 3. Form sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
 - 4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.
- B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
- C. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."
- D. Sealed Joints: Form non-expansion but movable joints in metal to accommodate elastomeric sealant.
- E. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
- F. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, non-corrosive metal.
- G. Fabricate cleats and attachment devices of sizes as recommended by SMACNA's "Architectural Sheet Metal Manual" and by FMG Loss Prevention Data Sheet 1-49 for application, but not less than thickness of metal being secured.
- H. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- I. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.
- J. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints where necessary for strength.
- K. No Dissimilar Metals - In no case, shall dissimilar metals come into contact with each other, nor shall a flashing be constructed in such a way as to permit water from running off one type metal onto another where chemical reaction or corrosion may occur.
- L. Do not use graphite pencils to mark metal surfaces.

2.5 ROOF DRAINAGE SHEET METAL FABRICATIONS

- A. Downspouts: Fabricate rectangular downspouts complete with mitered elbows. Furnish with metal hangers, from same material as downspouts, and anchors.
 - 1. Hanger Style: Match existing.
 - 2. Fabricate from the following materials:
 - a. Prefinished Aluminum
 - b. Prefinished Stainless Steel

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations,

dimensions and other conditions affecting performance of the Work.

1. Verify compliance with requirements for installation tolerances of substrates.
 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- B. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

- A. General: Install underlayment as indicated on Drawings.
- B. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Apply primer if required by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer rather than nails for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.

3.3 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
1. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
 2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
 3. Space cleats not more than 12 inches apart, unless called to be continuous in drawings. Anchor each cleat with two fasteners, unless noted otherwise. Bend tabs over fasteners.
 4. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
 5. Install sealant tape where indicated.
 6. Torch cutting of sheet metal flashing and trim is not permitted.
 7. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by SMACNA.
1. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene sheet.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
- D. Fastener Sizes: Use fasteners of sizes that will penetrate wood sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.
- E. Seal joints as shown and as required for watertight construction.
1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for

installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F.

2. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."

3.4 ROOF DRAINAGE SYSTEM INSTALLATION

- A. General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.
- B. Downspouts: Join sections with 1-1/2-inch telescoping joints.
 1. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches o.c. in between.
 2. Provide elbows at base of downspout to direct water away from building.
 3. Connect downspouts to underground drainage system indicated.

3.5 FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
- B. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4 inches over base flashing. Install stainless-steel draw band and tighten.

3.6 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
- B. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

3.7 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.
- D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of installation, remove unused materials and clean finished surfaces. Maintain in a clean condition during construction.
- E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 099113

EXTERIOR PAINTING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Paint
- B. Anti-graffitti coatings

1.2 SUMMARY

- A. This section includes surface preparation, painting, and finishing of exposed interior and exterior items and surfaces.
 - 1. Surface preparation, priming, and finish coats specified in this section are in addition to shop-priming and surface treatment specified under other sections.
- B. Paint exposed surfaces whether or not colors are designated in schedules, except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces. If color or finish is not designated, the Architect will select from standard colors or finishes available.
 - 1. Painting includes field-painting exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron work, and primed metal surfaces of mechanical and electrical equipment.

1.3 SUBMITTALS

- A. General: Submit the following according to conditions of the contract and division 1 specification sections.
- B. Product data for each paint system specified, including block fillers and primers.
 - 1. Provide the manufacturer's technical information including label analysis and instructions for handling, storage, and application of each material proposed for use.
 - 2. Certification by the manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).

1.4 QUALITY ASSURANCE

- A. Applicator Qualifications: Engage an experienced applicator who has completed painting system applications similar in material and extent to those indicated for the project that have resulted in a construction record of successful in-service performance.

- B. Single-Source Responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats.
- C. Field Samples: On wall surfaces and other exterior and interior components, duplicate finishes of prepared samples. Provide full-coat finish samples on at least 100 sq. ft. of surface until required sheen, color, and texture are obtained; simulate finished lighting conditions for review of in-place work.
 - 1. Final acceptance of colors will be from job-applied samples.

1.5 JOB CONDITIONS

- A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50°F (10°C) and 90°F (32°C).
- B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45°F (7°C) and 95°F (35°C).
- C. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85 percent; or at temperatures less than 5°F (3°C) above the dew point; or to damp or wet surfaces.
 - 1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer during application and drying periods.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include, but are not limited to the following:
 - 1. Benjamin Moore and Co. (Moore).
 - 2. PPG Industries, Pittsburgh Paints (PPG).
 - 3. Pratt and Lambert (P & L).
 - 4. Sherwin Williams S-W
 - 5. CSL SiCoat Anti-Graffiti Coating

2.2 PAINT MATERIALS, GENERAL

- A. Material Compatibility: Provide block fillers, primers, finish coat materials, and related materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by the manufacturer based on testing and field experience.
 - 1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the

exclusion of equivalent products of other manufacturers. Furnish the manufacturer's material data and certificates of performance for proposed substitutions.

- B. Colors: Provide color selections made by the Architect from the manufacturer's full range of standard colors. **For bidding purposes, contractors should assume 100% dark colors.**

2.3 PRIMERS

- A. Provide the manufacturer's recommended factory-formulated primers that are compatible with the substrate and finish coats indicated.

2.4 UNDERCOAT MATERIALS

- A. Provide the manufacturer's recommended factory-formulated undercoat materials that are compatible with the substrate and finish coats indicated.

2.5 EXTERIOR FINISH PAINT MATERIAL

- A. Provide the manufacturer's recommended factory-formulated finish-coat materials that are compatible with the substrate and undercoats indicated.

2.6 CLEAR SEALER FOR CONCRETE FLOORING

- A. Refer to Specification Section 033500

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions under which painting will be performed for compliance with paint application requirements. Surfaces receiving paint must be thoroughly dry before paint is applied.
 - 1. Do not begin to apply paint until unsatisfactory conditions have been corrected.
 - 2. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.
- B. Coordination of Work: Review other sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
 - 1. Notify the Architect about anticipated problems using the materials specified over substrates primed by others.

3.2 PREPARATION

- A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted, or provide surface-applied protection prior to surface preparation and painting. Remove these items, if necessary, to completely paint the items and adjacent surfaces. Following completion of painting operations in each space or area, have items reinstalled by workers skilled in the trades involved.
- B. Cleaning: Before applying paint or other surface treatments, clean the substrates of substances that could impair the bond of the various coatings. Remove oil and grease prior to cleaning. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
- C. Surface Preparation: Clean and prepare surfaces to be painted according to the manufacturer's instructions for each particular substrate condition and as specified.
 - 1. Provide barrier coats over incompatible primers or remove and re-prime. Notify Architect in writing about anticipated problems using the specified finish-coat material with substrates primed by others.
 - 2. Cementitious Materials: Prepare concrete masonry block, surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen, as required, to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
 - a. Use abrasive blast-cleaning methods if recommended by the paint manufacturer.
 - b. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not paint surfaces where moisture content exceeds that permitted in manufacturer's printed directions.
 - 3. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
 - a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
 - b. Prime, stain, or seal wood to be painted immediately upon delivery. Prime edges, ends, faces, undersides, and backsides of wood, including cabinets, counters, cases, and paneling.
 - c. Back prime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on backside.
 - d. Seal tops, bottoms, and cutouts of un-primed wood doors with a heavy coat of varnish or sealer immediately upon delivery.
 - 4. Ferrous Metals: Clean un-galvanized ferrous metal surfaces that have not been shop-coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of the Steel Structures Painting Council (SSPC).

- a. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by the paint manufacturer, and touch up with the same primer as the shop coat.
5. Galvanized Surfaces: Clean galvanized surfaces with non petroleum-based solvents so that the surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
- D. Materials Preparation: Carefully mix and prepare paint materials according to manufacturer's directions.
 1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
 2. Stir material before application to produce a mixture to uniform density; stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.
 3. Use only thinners approved by the paint manufacturer and only within recommended limits.
- E. Tinting: Tint each undercoat a lighter shade to facilitate identification of each coat where multiple coats of the same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.3 APPLICATION

- A. General: Apply paint according to manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.
- B. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
 1. Paint colors, surface treatments, and finishes are indicated in the schedules.
 2. Provide finish coats that are compatible with primers used.
 3. The number of coats and the film thickness required are the same regardless of the application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. Sand between applications where sanding is required to produce a smooth even surface according to the manufacturer's directions.
 4. Apply additional coats if undercoats, stains, or other conditions show through final coat of paint until paint film is of uniform finish, color, and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners, receive a dry film thickness equivalent to that of flat surfaces.

3.4 EXTERIOR PAINT APPLICATION SCHEDULE

- A. Provide the following paint systems for the various substrates indicated.
- B. Painted Wood:
 1. One coat of acrylic latex primer: as recommended by manufacturer

2. Semi-gloss: Two coats of acrylic; as recommended by manufacturer.
- C. Painted Ferrous Metal (Unprimed)
 1. One coat of acrylic latex primer: DTM Acrylic Primer/Finish; Series B66.
 2. Semi-gloss: Two coats of acrylic; Metalatex Semi-Gloss; Series B42.
- D. Painted Ferrous Metals, Factory Primed:
 1. Touch up primer: DTM Acrylic Primer/Finish; Series B66
 2. Semi-Gloss: Two coats of acrylic; Metalatex Semi-Gloss; Series B42
- E. Painted Ferrous Metals, Galvanized:
 1. One coat of acrylic primer; DTM Acrylic Semi-Gloss Coating, Series B66
 2. Semi-Gloss: Two coats of acrylic; Metalatex Semi-Gloss, Series B42
- F. Painted Aluminum, Unprimed:
 1. One coat acrylic primer; DTM Wash Primer, Series B71
 2. Semi-Gloss: Two coats of acrylic; Metalatex Semi-Gloss, Series B42.
- G. Painted Aluminum, Factory Primed
 1. Semi-Gloss: Two coats of acrylic latex; DTM Acrylic Semi-Gloss, Series B66
- H. Paint E-Pav - Pavement Marking Paint:
 1. Yellow: One coat, with reflective particles
 2. White: One coat, with reflective particles
- I. Cement Masonry Units
 1. One coat acrylic latex block filler; Heavy Duty Block Filler B42W46.
 2. One coat Enamel undercoat; ProMar 200 Alkyd Enamel Undercoater B49W200.
 3. Two coats alkyd enamel, Eg-Shel; ProMar 200 Alkyd Eg-Shel Enamel B33W200.
 4. Minimum total dry film thickness 15.6 mil.
- 3.5 ACCESSORY MATERIALS
 - A. Patching material: Latex filler
 - B. Fastener Head Cover Material: Latex Filler

END OF SECTION 099113

SECTION 26 00 00 - ELECTRICAL SPECIFICATIONS



1.1 GENERAL

- A. Sections of the Specifications covering general and supplemental conditions are a part of the contract and Contractors shall observe all of the requirements thereof, insofar as they pertain and are applicable to their respective work. Reference to Contractor or Contractors shall imply the Electrical Contractor.
- B. Contractor shall examine all Drawings and Specifications, visit the site of proposed construction; become fully informed as to the extent and character of the work required and make provisions for same in the amount of his proposal. It will be assumed that the Contractor, in submitting his proposal, has visited the premises and his proposal covers all work necessary to properly install his work.
- C. If any requirements of the Drawings and the Specifications appear to be difficult to perform, or if there is a question regarding performance, Contractor shall report same to the Engineer during the bidding period. The right to make any reasonable change in the location of outlets, apparatus, and equipment up to the time of rough-in is reserved by the Engineer without involving any additional expense.
- D. If any discrepancies occur during construction between work being performed by the Contractor and work of other trades, it shall be the responsibility of the Contractor to notify the Engineer immediately. Under no circumstances shall the Contractor proceed with any work conflicting with other trades until such time as the discrepancies have been corrected. In cases where interference develops, Engineer shall decide which work is to be relocated regardless of which was first installed.
- E. Contractor shall proceed with his work so as to conform to the progress of the work of other trades and not delay the project. Contractor shall complete all installations as soon as the conditions of the project will permit.

1.2 SCOPE

- A. Work to be accomplished under these Specifications includes the furnishing of all labor, materials, apparatus, and connections to complete, in finished operating condition the work for Marisol Boat Ramp Project, South Padre Island, Texas.
- B. Contractor shall take into account that deviations from routing and layout of new work indicated on the Drawings may be required to avoid interference with existing underground utilities. Contractor shall be responsible for rerouting of existing underground conduit, piping, etc., to avoid interference with new work if deviations in routing of new work cannot be made to avoid interference with existing underground utilities. Wiring, piping, etc., which serves loads or areas

to remain in use either temporarily or permanently will be rerouted as required and as directed to preserve continuity of service.

- C. All items of labor, material, or equipment not required in detail by the Specifications or Drawings, but incidental to, or necessary for the complete installation and proper operation of all phases of work described herein, or reasonably implied in connection therewith, shall be furnished as if called for in detail by the Specifications or Drawings.
- D. Work is to be completed from point of service to each outlet indicated on Drawings and/or specified herein with all accessory construction as may be required to make the installation of each piece of equipment complete and ready for normal service. In general, this work consists of the following:
 - 1. New underground service feeder from new pole mounted transformer.
 - 2. A system of conduits, junction boxes, pull boxes, outlet box with plate, wiring device, panelboard, stainless steel enclosure, lighting fixtures, light poles, conductors, time clock, lighting contactor, photo-electric sensor and related items for the power and lighting system.
- E. Installation of this work, including all materials and labor, shall be first class in every respect and in exact accordance with these Specifications and accompanying Drawings. It is intended that Specifications and accompanying Drawings shall include everything requisite and necessary for proper installation of electric wiring, even though every item may not be particularly mentioned in detail.

1.3 WORKMANSHIP

- A. All labor shall be performed in the best and most workmanlike manner by mechanics skilled in their particular trades. All installations shall be complete in both effectiveness and appearance whether finally enclosed or left exposed. Engineer reserves the right to direct the removal or replacement of any item which in his opinion does not present a reasonable, neat, or workmanlike appearance, providing that same can be properly installed in an orderly way by usual method for such work. All specialties and appurtenances shall be installed to conform to manufacturer's recommendations unless otherwise specified.

1.4 CODES, PERMITS, AND FEES

- A. Entire installation shall be done in strict accordance with all local, state, and federal ordinances, codes, and regulations.
- B. In the event there is a conflict between the Drawings and Specifications and the applicable codes, ordinances, and regulations, requirements of the codes, ordinances, and regulations shall govern. However, if the contract requirements are in excess of these requirements and do not conflict with the requirements, the contract provisions shall govern. If any work indicated on the Drawings is in conflict with codes, ordinances, and regulations, Contractor shall advise the Engineer so that discrepancies may be corrected on the Drawings and Specifications. Failure by the Contractor to advise of any discrepancies shall

leave the Contractor fully and completely responsible for compliance with all applicable codes and requirements.

- C. All work shall comply with Standards contained in applicable NFPA pamphlets and the requirements of the local authority having jurisdiction.
- D. Contractor shall obtain all permits and pay all fees necessary in connection with his work.

1.5 SAFETY STANDARDS

- A. It shall be Contractor's sole responsibility to initiate, maintain, and supervise all safety precautions required by local, state, and federal laws, including OSHA (Occupational Health and Safety Administration) and trench safety laws.

1.6 MATERIALS AND EQUIPMENT

- A. All materials and equipment furnished under this contract shall be in strict accordance with these Specifications, and shall be new. Equipment shall be of the latest or current products available. When two (2) or more articles of the same materials or equipment are required, the articles of each kind shall be standard products of a single reputable manufacturer. Electrical materials and equipment shall bear the label of UL (Underwriters Laboratories, Inc.).
- B. All materials and equipment shall be clearly marked, stamped, or labeled for identification. Identification marks or labels shall be plainly visible for inspection and shall not be obscured or obliterated in any manner. Covering shall not be done until so ordered by the Engineer.
- C. Contractor shall furnish to the Engineer, within a reasonable time after award of contract, and prior to commencing any work, complete brochures of all electrical gear, fixtures, lighting poles and devices which the Contractor proposes to furnish. Data shall include descriptive literature, performance data, diagrams, capacity information, etc., to substantiate that proposed equipment will meet all of the requirements of the Drawings and Specifications.
- D. All data must be checked and any required changes indicated thereon by the Contractor, signed, and dated prior to furnishing same to the Engineer for approval. Contractor's attention is directed that it is mandatory that he thoroughly review data prior to furnishing same to assure that equipment is in accordance with Drawings and Specifications and to assure prompt return of the data.
- E. If above information is not provided complete as specified above and within the allocated time, all equipment shall be furnished exactly as specified without any substitutions.
- F. In furnishing data of proposed equipment and materials, Contractor must, in writing, specifically call to attention of the Engineer every deviation from the Contract Drawings and Specifications.

- G. Review of data, Drawings, etc., shall not be construed as releasing the Contractor from further responsibility, but rather as a means to coordinate the work and to aid in the proper selection and installation of the equipment. All material and equipment shall be subject to final acceptance by the Engineer at the completion of the project.

1.7 WARRANTY

- A. Any defects from defective or improper materials or faults arising from improper workmanship which may appear within a period of twelve (12) months from the date of Final Acceptance shall be amended and made good by the Contractor at his own cost. Owner shall furnish to the Contractor a letter indicating the date of Final Acceptance.
- B. Where such defective work results in damage to existing facilities or the work of other trades, all such work shall be restored to its original condition at the expense of the Contractor by parties skilled in the particular work required.

1.8 PROTECTION

- A. All work, equipment, and materials shall be protected at all times to prevent damage or breakage either in storage, installation, or testing. All openings shall be closed with caps or plugs during installation. All material and equipment shall be covered and protected against dirt, water, chemicals, or mechanical injury. Failure on the part of the Contractor to provide adequate protection will be cause for rejection of the unprotected equipment and materials.

1.9 EXCAVATION AND BACKFILL

- A. Contractor shall provide all necessary excavation and backfilling required for his work. Excavation shall be backfilled with approved material tamped and puddled compactly in place to a density required to leave surface of ground at original level without settlement.
- B. Locations and routing of existing underground utilities are not indicated on the Drawings. Contractor is responsible for jobsite locating and protecting all existing underground utilities prior to trenching, drilling and/or excavating.

1.10 CLEANING

- A. Contractor shall thoroughly clean all equipment furnished and set by him and shall remove all debris that may have accumulated during the job. After equipment and materials are inspected, any discrepancies shall be amended as directed.

1.11 DRAWINGS

- A. These Specifications are accompanied by Drawings indicating typical layouts, conduit sizes, outlet, and equipment locations, etc. Drawings and these Specifications are complementary each to the other and what is called for by one shall be as binding as if called for by both. All electrical outlets indicated on

the Drawings are schematic. Exact location of each outlet shall be based upon existing conditions and actual requirements of equipment to be served.

- B. Drawings as prepared are in general diagrammatic. Contractor shall carefully lay out his work at the site to conform to existing conditions, civil, mechanical, and electrical conditions, to avoid all obstructions and to conform to details of installation as indicated on the Drawings and supplied by the manufacturers of the equipment to be installed and thereby to provide an integrated, satisfactorily operating installation. All necessary offsets in piping, fittings, etc., required to avoid interferences between piping, equipment, civil shall be furnished and installed by the Contractor without additional expense to the Owner.
- C. Routing paths for all power feeders and branch circuits are not indicated on the Drawings. Routing paths which are indicated are schematic and are not accompanied by dimensional data nor detailed for every required offset. Contractor shall have his choice of routing paths for such raceways provided that this routing does not interfere with existing conditions and does not violate the requirements of the Owner. In cases where interference develops, or in cases where proposed routing is not in accordance with the requirements of the Owner, a representative of the Owner will direct the required path of routing. All trenching, tunneling, conductors, conduit, boxes, fittings, and conduit supports required to install raceways indicated on the power riser diagram, and electrical site plan are hereby included in the contract and shall be included in the proposal submitted by the Contractor.
- D. These Specifications and Drawings accompanying same are intended to cover systems which will not interfere with new or existing conditions, which will fit into the available space, and which will ensure complete and satisfactory systems. Contractor shall, therefore, carefully examine the Drawings and the existing site and shall be responsible for the coordination of his material and apparatus with site conditions.
- E. Contractor's attention is directed that all equipment he proposes to furnish must fit into the space allocated for same on the Drawings. It shall be the Contractor's responsibility to furnish data to evident that sufficient space can be provided for the installation of proposed equipment and that adequate access will exist for service and maintenance of equipment.

1.12 CHANGES

- A. Any changes from the Drawings necessary to make the installation conform to building construction, to make this work fit the work of other trades, or to make this work conform to the rules of the city and municipal bodies having jurisdiction shall be made by the Contractor at his (the Contractor's) own expense.

1.13 ELECTRICAL SERVICE

- A. New service utilization voltage shall be solidly grounded, 120/240 volt, 1-phase, 3-wire nominal. Power Company will provide service, indicated on Drawings. Contractor shall be responsible for contacting Power Company for all costs and requirements.

- B. Power company construction costs associated with the provision of permanent power shall be paid to the power company by the Owner. Power Company costs associated with the provision of temporary construction power shall be paid to the power company by the Contractor.
- C. Contractor shall furnish all new service equipment not furnished by Power Company for a complete installation. Contractor shall provide transformer grounding as directed by the power company.
- D. Contractor shall furnish the underground conduit system, and related items for the underground secondary system.
- E. Termination of secondary conduit and wiring at the power pole shall be as directed by the power company. Termination of secondary conduit and wiring at the service main shall be as indicated on the Drawings and in these Specifications.
- F. Metering will be coordinated and provided in accordance with power company requirements.

1.14 TEMPORARY POWER AND LIGHTING

- A. Contractor shall provide all necessary wiring, service switches, poles, ground fault protection equipment, etc., required for temporary power and lighting during construction.

1.15 GROUNDING

- A. The entire electrical system shall be grounded in accordance with Article 250 of the National Electrical Code, and as hereinafter specified.
- B. Main service entrance ground shall be as indicated on Drawings.
- C. Each lighting pole shall have ground rod installed concealed in pole base. All such ground rods shall be installed to have a minimum 7' direct contact with earth. All metallic pole caps shall be bonded to ground rod with #6 AWG copper conductor.
- D. Driven ground rods shall be provided where required and/or where indicated on the Drawings. Ground rods shall be minimum 5/8" x 8'-0" Copper-weld or equal. All ground wiring shall have adequate mechanical protection, and be exothermically welded to rods.
- E. Grounding electrode and equipment conductors with a "green" colored insulated jacket shall be provided and installed in all raceways, whether non-metallic or metallic.
- F. Equipment shall have an effective equipment ground in accordance with the National Electrical Code.

1.16 CONDUIT AND TUBING

- A. Conduit size shall be 1/2" unless otherwise indicated on the Drawings or otherwise specified.
- B. Conduit installed underground shall be Schedule 40 rigid polyvinylchloride (PVC) conduit as manufactured by Carlon or approved equal, installed in accordance with National Electrical Code, and as indicated on Drawings. All PVC conduit shall have Underwriters Laboratory, Inc. approval for direct burial underground without concrete encasement. All PVC plastic conduit must be installed in accordance with manufacturer's recommendations and in strict accordance with the applicable sections of these Specifications.
- C. Conduit installed above grade in damp or wet locations shall be Schedule 80 rigid PVC conduit as manufactured by Carlon or approved equal, installed in accordance with National Electrical Code, and as indicated on Drawings. All PVC plastic conduit must be installed in accordance with manufacturer's recommendations and in strict accordance with the applicable sections of these Specifications
- D. Flexible metal conduit shall not be used for any purpose except where specifically indicated on the drawings within the new switchgear enclosure. Non-metallic flexible conduit will not be acceptable for any purpose. Premanufactured cable shall not be used for any purpose.

1.17 INSTALLATION AND ROUTING OF CONDUITS

- A. All conduit shall be run in the straightest possible path.
- B. Not more than three (3) 90 degree bends will be permitted in any one (1) conduit run and no run shall be longer than allowed by the National Electrical Code without the installation of pull boxes. There shall not be any pull boxes or junction boxes installed in inaccessible space.
- C. In no case shall conduit be fastened to other pipe or equipment or so installed as to prevent the ready removal of other pipes or equipment for repairs.
- D. Elbows in PVC conduit below grade shall be Schedule 80 PVC.
- E. Provision shall be made for expansion and contraction of all conduit as hereinafter specified.
- F. Underground conduits shall be installed in accordance with details on the Drawings, and as hereinafter specified. All underground conduits shall have a minimum cover from top of conduit to finished grade of at least 24".
- G. Provide 4" wide yellow warning tape 1'-0" above all underground conduit.
- H. All conduit which is stubbed and capped below grade for future services shall be terminated with PVC T/A and female threaded rigid galvanized steel cap so that stub may be located in the future with a metal detector.

1.18 EXPANSION JOINTS

- A. Provision for expansion and shifting of conduits shall be provided where conduit rises from underground and terminate at switchgear enclosure, utility meter, or other fixed device shall have PVC expansion fitting installed above grade.

1.19 CONCRETE

- A. All concrete footings shall be readymix type transit mix and shall be continuously agitated until poured. Concrete shall be minimum 2,500 pound strength after 30 days.

1.20 HANGERS AND SUPPORTS

- A. Contractor shall provide all hangers and supports for supporting all conduit, gutters, cabinets, and equipment of all types. All hangers and supports shall be secure and of a type appropriate in design, application, and dimensions for the particular application.

1.21 PAINTING

- A. Electrical Contractor shall touch-up or refinish if so directed by the Engineer any panels, cabinets, fixtures, and other equipment furnished with a factory finish which shall become damaged in shipment or installation.

1.22 CONDUCTORS

- A. All wiring and cables shall be insulated soft-drawn annealed 98% conductivity copper and shall be new. Voltage rating of wire and cable shall be 600 volts A.C.
- B. All wire No. 10 AWG and smaller shall be solid and wire of larger size shall be stranded unless otherwise specified herein. Stranded wire will not be permitted for termination at wiring devices rated 20 amperes or less.
- C. Power feeder and branch circuit wire and cables shall have insulation Type THWN unless indicated otherwise on Drawings. Standard wire size shall be No. 12 AWG copper and this size shall be used except where other sizes are indicated on the Drawings, otherwise specified herein, or otherwise required by the Code. On any run 100 feet in length or longer, No. 10 AWG copper shall be used in place of No. 12. Feeder cables shall be identified by suitable tags where they pass through pull boxes. Conductors as manufactured by Cablec, Capitol, American Insulated, Houston Wire and Cable, Southwire, and Okonite will be acceptable.
- D. All wire for special systems and special conditions shall be as specified and/or as indicated on the Drawings.

1.23 WIRE PULLING LUBRICANTS

- A. Contractor shall use "CableEase" or approved equal wire pulling lubricants for all wire installation. Soaps or other substitute material having electrical conduction properties are not acceptable.

1.24 COLOR-CODING AND TAGGING

- A. All wiring furnished shall be color-coded. Conductors #10 AWG and smaller shall have insulation colored as follows. Conductors larger than #10 AWG may be black with tape manufactured for this application and colored as follows. All such conductors shall be color code taped at all junctions and terminations.
 - 1. 120/240 volt, single phase: Red and Black.
 - 2. Ground conductors: Green.
- B. Identification shall be accomplished by means of Brady "Quick-Labels" or approved equal attached permanently to all wire requiring identification in addition to the color-coding. Acceptable manufacturers: Thomas and Betts, Ideal.

1.25 INSULATION OF SPLICES AND CABLE TERMINATION

- A. Splices/junctions for conductors No. 6 and larger will not be permitted. Wire No. 8 and smaller shall be spliced with U.L. listed wire nuts.

1.26 OUTLET AND SWITCH BOXES

- A. All boxes shall be securely attached to the support structure.
- B. Any boxes not installed in a workmanlike manner shall be removed by Contractor; surface repaired, and box reset.
- C. Boxes and conduit fittings for outdoor work shall be cast metal, watertight, and have gasketed coverplates.

1.27 WIRING DEVICES

- A. Wiring devices, or approved equal, as scheduled and/or indicated on the Drawings shall be furnished and installed. All receptacles shall be grounding type, and shall be polarized in accordance with the latest standards of the National Electrical Code.

1.28 COVERPLATE

- A. Receptacle coverplate shall be rain-tight while-in-use type die cast aluminum covers.

1.29 LIGHTING FIXTURES

- A. Lighting fixtures as hereinafter specified and as indicated on the Drawings shall be furnished and installed by the Contractor. Installation details and scheduled

information indicated on the Drawings describe the requirements of each fixture type and shall apply where applicable.

- B. LED light engines and drivers shall be factory installed for all fixtures.
- C. Values of life expectancy, input power, output frequency, power factor, and total harmonic distortion for LED drivers and light engines shall be equivalent in all respects to the values of drivers and light engines selected by scheduled information on the Drawings.
- D. Data furnished on lighting fixtures shall indicate specifically by manufacturer their compliance with the above special requirements where applicable. If this information is not provided, the data cannot be accepted.
- E. Substitutions may be offered by the Contractor, provided the substitute fixture is equal to the specified fixture in performance, physical appearance, mechanical features and efficiency.

1.30 LIGHTING POLES

- A. Lighting poles as hereinafter specified and as indicated on the Drawings shall be furnished and installed by the Contractor. Installation details and scheduled information indicated on the Drawings describe the requirements of each pole and shall apply where applicable.
- B. Lighting pole shall be NOV Cat. No. MBR07SPL medium base round pole, 20' above grade height (113I) Grey Natural exposed aggregate finish amersshield coating, MODBM, special pole length, with MODDCI, MODFE, and/or MOD10K, hand hole cover and frame anodized and painted gray aluminum RAL9007, collar anodized and painted 9007 gray aluminum RAL9007, single side mount inserts at 180 degrees with plastic top cap.
- C. Each lighting pole shall be furnished with Cat. No. 42030E set of 4 anchor bolts.
- D. Each lighting pole shall be furnished with Cat. No. BCA13070RACDEA aluminum base cover for MBR07, anodized and painted gray aluminum RAL9007.
- E. Substitutions may be offered by the Contractor, provided the substitute pole is equal to the specified pole in performance, physical appearance, structural integrity.

1.31 CIRCUITING

- A. Contractor shall connect all wires so as to provide the arrangement of circuits indicated on the Drawings.

1.32 IDENTIFICATION AND LABELING OF DISTRIBUTION GEAR

- A. Contractor shall furnish white thermoplastic (1/8" thick) with black sunken letters (3/4" stroke) for the panelboard. Label shall be permanently attached to service side of panelboard.
- B. Identification and labeling of individual branch circuit devices shall be provided as hereinafter specified.

1.33 SPACES AND SPARES

- A. Where spaces are indicated on the Drawings for the panelboard, all such spaces shall be completely equipped provisions such that future installation of overcurrent devices requires no accessory apparatus.
- B. Where spares are indicated on the Drawings for the panelboard, all such spares shall be completely equipped and line side connected devices, such that future use of same requires load side connection only.

1.34 PANELBOARDS AND CABINETS

- A. Contractor shall furnish the panelboard as indicated on Drawings, and riser diagram. Panelboard shall be of dead-front type and shall be complete with lockable door and trim. Door shall be equipped with spring latch and tumbler-lock. All locks shall be keyed alike and two (2) keys shall be provided to the Owner for each lock. Cabinets shall be 20" wide code gauge steel and boxes shall be galvanized. The panel shall have main breaker as indicated. Branch circuits shall be equipped with bolt-on type automatic circuit breakers for each circuit. Panelboard shall bear the Underwriters Laboratories, Inc., seal of approval. Panelboard shall have tin plated copper bussing with capacity as indicated. Lugs shall be UL listed to accept solid or stranded copper and aluminum conductors.
- B. Panel shall be Square D Type NQOD with QOB circuit breakers or equal for 120/240 volt use. Multi-pole breakers shall be one handle common trip.
- C. Panelboard shall have 100% rated copper neutral bus and copper ground bar.
- D. Branch circuits as indicated on the Drawings shall be connected to the corresponding breaker number of the panels insofar as possible. Each circuit bearing load shall be identified on a typewritten directory card inside the door of each panel. Spare circuit breakers and spaces shall be hand written in pencil on directory card.
- E. Panelboard by Eaton and Siemens will be acceptable.

1.35 ACCESSORY CONSTRUCTION APPARATUS

- A. It is the intention that these Specifications shall provide a complete installation, except as herein specifically excepted. All accessory construction and apparatus necessary or advantageous in the operation or testing of the work

shall be included. Omission of specific references to any part of the work necessary for such complete installation shall not be interpreted as relieving the Contractor from furnishing such work.

1.36 TESTS/DEMONSTRATION

- A. The entire system upon completion shall be "Meggered" for faults in accordance with methods approved by I.E.E.E. and National Electrical Code if so directed by the Engineer.
- B. A demonstration shall be performed in the presence of a representative of the Owner. Equipment installed and/or connected by the Contractor shall be put through their normal operating paces and all such equipment shall be required to operate to the satisfaction of the representative of the Owner on completion of the job.

1.37 INSTRUCTIONS

- A. Contractor shall provide for instructing an employee or employees of the Owner in the operation and maintenance of the systems. Duplicate sets of manufacturer's certified drawings, specifications, operating instructions, maintenance manuals, and maintenance instructions on all equipment furnished by Contractor shall be furnished to the Owner.

1.38 WORKMANSHIP AND INSTALLATION

- A. Contractor shall have his choice as to the location of conduits, pull boxes, etc., except for locations set by dimensions on Drawings, provided his choices do not interfere with piping, fixtures, and equipment installed by other Contractors working on the same project, and do not interfere with the characteristic features of the building. In cases of such interference, the Engineer will determine the locations of the interfering items.
- B. Contractor shall make such progress in his work that he will not delay the work of other trades unduly.
- C. Contractor shall provide service to all using connections.
- D. Cutting of any structural member, regardless of material, shall be kept at a minimum. Contractor shall pay for repairing damage to such members.
- E. All electrical fixtures and fittings of all types shall be properly supported to construction.

END OF SECTION 26 00 00

SECTION 310620.16
UTILITY BACKFILL MATERIALS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Material Classifications.
- B. Utility Backfill Materials:
 - 1. Concrete sand
 - 2. Gem sand
 - 3. Pea gravel
 - 4. Crushed Aggregate: Crushed stone
 - 5. Crushed Aggregate: Crushed concrete
 - 6. Bank run sand
 - 7. Select backfill
 - 8. Random backfill
- C. Material Handling and Quality Control Requirements.

1.2 MEASUREMENT AND PAYMENT

- A. Unit Prices.
 - 1. No payment will be made for backfill material under this Section. Include payment in unit price for applicable utility installation.

1.3 DEFINITIONS

- A. Unsuitable Material: Unsuitable soil materials are the following:
 - 1. Materials that are classified as ML, CL-ML, MH, PT, OH, and OL according to ASTM D 2487.
 - 2. Materials that cannot be compacted to the required density because of either gradation, plasticity, or moisture content.
 - 3. Materials that contain large clods, aggregate, and stones greater than 4 inches in any dimension; debris, vegetation, and waste; or any other deleterious materials.
 - 4. Materials that are contaminated with hydrocarbons or other chemical contaminants.
- B. Suitable Material: Suitable soil materials are the following:
 - 1. Those meeting this specification requirements.

- 2 Unsuitable soils meeting specification requirements for suitable soils after treatment with lime or cement.
- C. Foundation Backfill Materials: Natural soil or manufactured aggregate meeting Class I requirements and geotextile filter fabrics as required, to control drainage and material separation. Foundation backfill material is placed and compacted as backfill where needed to provide stable support for the structure foundation base. Foundation backfill materials may include concrete fill and seal slabs.
- D. Foundation Base: Crushed stone aggregate with filter fabric as required, cement stabilized sand, or concrete seal slab. The foundation base provides a smooth, level working surface for the construction of the concrete foundation.
- E. Backfill Material: Classified soil material meeting specified quality requirements for the designated application as embedment or trench zone backfill.
- F. Embedment Material: Soil material placed under controlled conditions within the embedment zone extending vertically upward from top of foundation to an elevation 12 inches above top of pipe, and including pipe bedding, haunching, and initial backfill.
- G. Trench Zone Backfill: Classified soil material meeting specified quality requirements and placed under controlled conditions in the trench zone from top of embedment zone to base coarse in paved areas or to the surface grading material in unpaved areas.
- H. Foundation: Either suitable soil of the trench bottom, or material placed as backfill of over-excavation for removal and replacement of unsuitable or otherwise unstable soils.
- I. Source: A source selected by the Contractor for supply of embedment or trench zone backfill material. A selected source may be the project excavation, off-site borrow pits, commercial borrow pits, or sand and aggregate production or manufacturing plants.
- J. Refer to Section 31 23 16.16 - Excavation and Backfill for Utilities for other definitions regarding utility installation by trench construction.

1.4 REFERENCES

- A. ASTM C 33 - Specification for Concrete Aggregate.
- B. ASTM C 40 - Test Method for Organic Impurities in Fine Aggregates for Concrete.
- C. ASTM C 123 - Test Method for Lightweight Pieces in Aggregate.
- D. ASTM C 131 - Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
- E. ASTM C 136 - Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- F. ASTM C 142 - Test Method for Clay Lumps and Friable Particles in Aggregates.

- G. ASTM D 1140 - Test Method for Amount of Materials in Soils Finer Than No. 200 Sieve.
- H. ASTM D 2487 - Classification of Soils for Engineering Purposes (Unified Soil Classification System).
- I. ASTM D 2488 - Standard Practice for Description and Identification of Soils (Visual-Manual Procedure).
- J. ASTM D 4318 - Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- K. ASTM D 4643 - Method for Determination of Water (Moisture) Content of Soil by the Microwave Oven Method.
- L. TxDOT Tex-101-E - Preparation of Soil and Flexible Base Materials for Testing.
- M. TxDOT Tex-104-E - Test Method for Determination of Liquid Limit of Soils (Part 1)
- N. TxDOT Tex-106-E - Test Method - Methods of Calculating Plasticity Index of Soils.
- O. TxDOT Tex-110-E - Determination of Particle Size Analysis of Soils.

1.5 SUBMITTALS

- A. Conform to requirements of Section 01 33 00 - Submittal Procedures.
- B. Submit a description of source, material classification and product description, production method, and application of backfill materials.
- C. Submit test results for samples of off-site backfill materials to comply with Paragraph 2.3, Materials Testing.
- D. Before stockpiling materials, submit a copy of temporary easement or approval from landowner for stockpiling backfill material on private property.
- E. For each delivery of material, provide a delivery ticket which includes source location.

1.6 TESTS

- A. Perform tests of sources for backfill material in accordance with Paragraph 2.3.
- B. Verification tests of backfill materials may be performed by the Owner in accordance with Section 01 45 29 - Testing Laboratory Services and in accordance with Paragraph 3.3.
- C. Random fill obtained from the project excavation as source is exempt from pre-qualification requirements by Contractor but must be inspected by the testing lab for unacceptable materials based on ASTM D 2488.

PART 2 - PRODUCTS

2.1 MATERIAL CLASSIFICATIONS

A. Materials for backfill shall be classified for the purpose of quality control in accordance with the Unified Soil Classification Symbols as defined in ASTM D 2487. Material use and application is defined in utility installation specifications and Drawings either by class, as described in Paragraph 2.1B, or by product descriptions, as given in Paragraph 2.2.

B. Class Designations Based on Laboratory Testing:

1. Class I: Well-graded gravels and sands, gravel-sand mixtures, crushed well-graded rock, little or no fines (GW, SW):
 - a. Plasticity index: nonplastic.
 - b. Gradation: D60/D10 - greater than 4 percent; amount passing No. 200 sieve - less than or equal to 5 percent.
2. Class II: Poorly graded gravels and sands, silty gravels and sands, little to moderate fines:
 - a. Plasticity index: nonplastic to 4.
 - b. Gradations:
 - (1) Gradation (GP, SP): amount passing No. 200 sieve - less than 5 percent.
 - (2) Gradation (GM, SM): amount passing No. 200 sieve - between 12 percent and 50 percent.
 - (3) Borderline gradations with dual classifications (e.g., SP-SM): amount passing No. 200 sieve - between 5 percent and 12 percent.
3. Class III: Clayey gravels and sands, poorly graded mixtures of gravel, sand, silt, and clay (GC, SC, and dual classifications, e.g., SP-SC):
 - a. Plasticity index: greater than 7.
 - b. Gradation: amount passing No. 200 sieve - between 12 percent and 50 percent.
4. Class IVA: Lean clays (CL).
 - a. Plasticity Indexes:
 - (1) Plasticity index: greater than 7, and above A line.
 - (2) Borderline plasticity with dual classifications (CL-ML): PI between 4 and 7.

- b. Liquid limit: less than 50.
 - c. Gradation: amount passing No. 200 sieve - greater than 50 percent.
 - d. Inorganic.
- 5. Class IVB: Fat clays (CH)
 - a. Plasticity index: above A line.
 - b. Liquid limit: 50 or greater.
 - c. Gradation: amount passing No. 200 sieve - greater than 50 percent.
 - d. Inorganic.
- 6. Use soils with dual class designation according to ASTM D 2487, and which are not defined above, according to the more restrictive class.

2.2 PRODUCT DESCRIPTIONS

- A. Soils classified as silt (ML), elastic silt (MH), organic clay and organic silt (OL, OH), and organic matter (PT) are not acceptable as backfill materials. These soils may be used for site grading and restoration in unimproved areas as approved by the Owner. Soils in Class IVB, fat clay (CH) may be used as backfill materials where allowed by the applicable backfill installation specification. Refer to Section 31 23 16.16 - Excavation and Backfill for Utilities.
- B. Provide backfill material that is free of stones greater than 4 inches, free of roots, waste, debris, trash, organic material, unstable material, non-soil matter, hydrocarbon or other contamination, conforming to the following limits for deleterious materials:
 - 1. Clay lumps: Less than 0.5 percent for Class I, and less than 2.0 percent for Class II, when tested in accordance with ASTM C 142.
 - 2. Lightweight pieces: Less than 5 percent when tested in accordance with ASTM C 123.
 - 3. Organic impurities: No color darker than standard color when tested in accordance with ASTM C 40.
- C. Manufactured materials, such as crushed concrete, may be substituted for natural soil or rock products where indicated in the product specification, and approved by the Engineer, provided that the physical property criteria are determined to be satisfactory by testing.
- D. Bank Run Sand: Durable bank run sand classified as SP, SW, or SM by the Unified Soil Classification System (ASTM D 2487) meeting the following requirements:

1. Less than 15 percent passing the number 200 sieve when tested in accordance with ASTM D 1140. The amount of clay lumps or balls not exceeding 2 percent.
 2. Material passing the number 40 sieve shall meet the following requirements when tested in accordance with ASTM D 4318:
 - a. Liquid limit: not exceeding 25 percent.
 - b. Plasticity index: not exceeding 7.
- E. Concrete Sand: Natural sand, manufactured sand, or a combination of natural and manufactured sand conforming to the requirements of ASTM C 33 and graded within the following limits when tested in accordance with ASTM C 136:

Sieve	Percent Passing
3/8"	100
No. 4	95 to 100
No. 8	80 to 100
No. 16	50 to 85
No. 30	25 to 60
No. 50	10 to 30
No. 100	2 to 10

- F. Gem Sand: Sand conforming to the requirements of ASTM C 33 for coarse aggregates specified for number 8 size and graded within the following limits when tested in accordance with ASTM C 136:

Sieve	Percent Passing
3/8"	95 to 100
No. 4	60 to 80
No. 8	15 to 40

- G. Pea Gravel: Durable particles composed of small, smooth, rounded stones or pebbles and graded within the following limits when tested in accordance with ASTM C 136:

Sieve	Percent Passing
1/2"	100
3/8"	85 to 100
No. 4	10 to 30
No. 8	0 to 10
No. 16	0 to 5

- H. Crushed Aggregates: Crushed aggregates consist of durable particles obtained from an approved source and meeting the following requirements:

1. Materials of one product delivered for the same construction activity from a single source.
2. Non-plastic fines.
3. Los Angeles abrasion test not exceeding 45 percent when tested in accordance with ASTM C 131.
4. Crushed aggregate shall have a minimum of 90 percent of the particles retained on the No. 4 sieve with 2 or more crushed faces as determined by Test Method Tex-460-A, Part I.
5. Crushed stone: Produced from oversize plant processed stone or gravel, sized by crushing to predominantly angular particles from a naturally occurring single source. Uncrushed gravel is not acceptable material for embedment where crushed stone is shown on the applicable utility embedment drawing details.
6. Crushed Concrete: Crushed concrete is an acceptable substitute for crushed stone as utility backfill. Gradation and quality control test requirements are the same as crushed stone. Provide crushed concrete produced from normal weight concrete of uniform quality; containing particles of aggregate and cement material, free from other substances such as asphalt, reinforcing steel fragments, soil, waste gypsum (calcium sulfate), or debris.
7. Gradations, as determined in accordance with Tex-110-E.

Sieve	Percent Passing by Weight for Pipe Embedment by Ranges of Nominal Pipes Sizes		
	>15"	15" - 8"	<8"
1"	95 - 100	100	-
3/4"	60 - 90	90 - 100	100
1/2"	25 - 60	-	90 - 100
3/8"	-	20 - 55	40 - 70
No. 4	0 - 5	0 - 10	0 - 15
No. 8	-	0 - 5	0 - 5

- I. Select Backfill: Class III clayey gravel or sand or Class IV lean clay with a plasticity index between 7 and 20 or clayey soils treated with lime in accordance with Section 32 01 00 - Pavement Repair and Resurfacing, to meet plasticity criteria. Structural Select Backfill shall need the requirements described in the design plans or as directed by the Engineer.
- J. Random Backfill: Any suitable soil or mixture of soils within Classes I, II, III and IV; or fat clay (CH) where allowed by the applicable backfill installation specification. Refer to Section 31 23 16.16 - Excavation and Backfill for Minor Structures and Section 31 23 23.13 - Excavation and Backfill for Utilities.
- K. Cement Stabilized Sand: Conform to requirements of Section 31 32 13.16 - Cement Stabilized Sand.

- L. Concrete Backfill: Conform to Class B concrete as specified in Section 33 05 16 - Concrete for Utility Construction.

2.3 MATERIAL TESTING

- A. Ensure that material selected, produced and delivered to the project meets applicable specifications and is of sufficient uniform properties to allow practical construction and quality control.
- B. Source or Supplier Qualification. Perform testing, or obtain representative tests by suppliers, for selection of material sources and products. Provide test results for a minimum of three samples for each source and material type. Test samples of processed materials from current production representing material to be delivered. Tests shall verify that the materials meet specification requirements. Repeat qualification test procedures each time the source characteristic changes or there is a planned change in source location or supplier. Qualification tests shall include, as applicable:
 - 1. Gradation. Complete sieve analyses shall be reported regardless of the specified control sieves. The range of sieves shall be from the largest particle through the No. 200 sieve.
 - 2. Plasticity of material passing the No. 40 sieve.
 - 3. Los Angeles abrasion test of material retained on the No. 4 sieve.
 - 4. Clay lumps.
 - 5. Lightweight pieces
 - 6. Organic impurities
- C. Production Testing. Provide reports to the Owner and the Engineer from an independent testing laboratory that backfill materials to be placed in the Work meet applicable specification requirements.
- D. Assist the Owner and Testing Lab in obtaining material samples for verification testing at the source or at the production plant.

PART 3 - EXECUTION

3.1 SOURCES

- A. Use of material encountered in the trench excavations is acceptable, provided applicable specification requirements are satisfied. If excavation material is not acceptable, provide from other approved source.
- B. Identify off-site sources for backfill materials at least 14 days ahead of intended use so that the Owner or Lab may obtain samples for verification testing.

- C. Obtain approval for each material source by the Owner before delivery is started. If sources previously approved do not produce uniform and satisfactory products, furnish materials from other approved sources. Materials may be subjected to inspection or additional verification testing after delivery. Materials which do not meet the specifications will be rejected. Do not use material which, after approval, has become unsuitable for use due to segregation, mixing with other materials, or by contamination. Once a material is approved by the Owner, expense for sampling and testing required to change to a different material will be credited to the Owner through a change order.
- D. Bank run sand, select backfill, and random backfill, if available in the project excavation, may be obtained by selective excavation and acceptance testing. Obtain additional quantities of these materials and other materials required to complete the work from off-site sources.
- E. The Owner or any provided geotechnical reference information does not represent or guarantee that any soil found in the excavation work will be suitable and acceptable as backfill material.

3.2 MATERIAL HANDLING

- A. When backfill material is obtained from either a commercial or non-commercial borrow pit, open the pit to expose the vertical faces of the various strata for identification and selection of approved material to be used. Excavate the selected material by vertical cuts extending through the exposed strata to achieve uniformity in the product.
- B. Establish temporary stockpile locations for practical material handling and control, and verification testing by the Owner in advance of final placement. Obtain approval from landowner for storage of backfill material on adjacent private property.
- C. When stockpiling backfill material near the project site, use appropriate covers to eliminate blowing of materials into adjacent areas and prevent runoff containing sediments from entering the drainage system.
- D. Place stockpiles in layers to avoid segregation of processed materials. Load material by making successive vertical cuts through entire depth of stockpile.

3.3 FIELD QUALITY CONTROL

A. Quality Control

- 1. The Owner or Engineer may sample, and test backfill at:
 - a. Sources including borrow pits, production plants and Contractor's designated off-site stockpiles.
 - b. On-site stockpiles.
 - c. Materials placed in the Work.

2. The Owner or Engineer may resample material at any stage of work or location if changes in characteristics are apparent.
- B. Production Verification Testing: The Owner's testing laboratory will provide verification testing on backfill materials, as directed by the Engineer. Samples may be taken at the source or at the production plant, as applicable.

END OF SECTION

SECTION 311000

SITE CLEARING – PREPARATION OF SITE

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. This Item shall govern for the preparation of the site for construction operations by the removal and disposal of all obstructions, including obstructions not otherwise shown on the plans and specifications.
- B. Such obstructions shall be considered to include remains of houses, foundations, floor slabs, concrete, brick, lumber, plaster, septic tank drain fields, basements, abandoned utility pipes or conduits, equipment, fences, retaining walls, outhouses and shacks.
- C. This Item shall also include the removal of trees and shrubs and other landscape features not designated for preservation, stumps, brush, roots, vegetation, logs, curb and gutter, driveways, paved parking areas, miscellaneous stone, sidewalks, drainage structures, manholes, inlets, abandoned railroad tracks, scrap iron and debris, whether above or below ground except live utility facilities.

1.2 UNIT PRICES

- A. No separate payment will be made for work performed under this Section. Include cost of such work in Contract unit prices for items listed in bid form requiring site clearing – preparation of site.

PART 2 - EXECUTION

2.1 PREPARATION

- A. All areas, as shown on the plans, shall be cleared of all structures and obstructions as defined above. Those trees, shrubs and other landscape features specifically designated by the Engineer for preservation shall be carefully protected from abuse, marring, or damage during construction operations. Continual parking and/or servicing of equipment under the branches of trees marked for preservation will not be permitted. When trees and shrubs are designated for preservation and require pruning, they shall be trimmed as directed by the Engineer and all exposed cuts over 2 inches in diameter shall be treated with a material approved by the Engineer.
- B. Culverts, storm sewers, manholes and inlets shall be removed in proper sequence for maintenance of traffic and drainage.
- C. Underground obstructions, except those items designated for preservation, shall be removed to the following depths:

1. In areas to receive embankment: 2 feet below natural ground, except when permitted by the plans, trees and stumps may be cut off as close to natural ground as practicable on areas which are to be covered by at least three feet of embankment.
2. In areas to be excavated: 2 feet below the lower elevation of the excavation.
3. All other areas: 1 foot below natural ground.

2.2 DISPOSAL

- A. Unless otherwise instructed by Owner or Engineer, all brush from existing trees and vegetation cleared on project site shall be collected and neatly stored on-site, in an area designated by Owner (for mulching and reuse).
- B. Contractor shall remove all debris, rock, trash and other material deemed objectionable by Owner or Engineer. Disposal shall be off-site shall be at contractor's sole expense.
- C. Unless otherwise shown herein, all materials and debris removed shall become the property of the Contractor and shall be removed from the project site in a manner satisfactory to Owner and Engineer.
- D. No timber shall be cut or defaced outside of the areas identified for clearing and demolition.

2.3 BACKFILL

- A. Holes remaining after removal of all obstructions, objectionable material, trees, stumps, etc., shall be backfilled with approved material, compacted and restored to approximately its original contours by blading, bulldozing, or by other methods, as approved by the Engineer. In areas to be immediately excavated, the backfilling of holes may not be required when approved by the Engineer.
- B. Before backfilling, the remaining ends of all abandoned storm sewers, culverts, sanitary sewers, conduits, and water or gas pipes over 3 inches in diameter, shall be plugged with an adequate quantity of concrete to form a tight closure.

END OF SECTION

SECTION 312300

EARTHWORK, EXCAVATION, FILL AND GRADING

PART 1 - GENERAL

- 1.1 This section shall cover earthwork, including general clearing, removal, disposal or reutilization of all excavated earthen materials necessary and placement of imported fill material for performing the Work as shown on the drawings, including sheeting and bracing, drainage, and other Work incidental to the preparation of the site for subsequent construction Work.

1.2 UNIT PRICES

A. Unit Prices.

1. No separate payment will be made for work performed under this Section unless listed in the bid items. Include cost of such work in Contract unit prices for items listed in bid form requiring earthwork, excavation, fill and grading.

PART 2 - PRODUCTS

- 2.1 Excavated Material: Contractor will utilize all of the excess excavated soil material that is not deemed objectionable unless otherwise instructed. All material will be placed, spread, compacted to lines and grades shown on plans or as directed by Engineer
- 2.2 Imported Fill: Select Backfill is acceptable as follows - Class III clayey gravel or sand or Class IV lean clay with a plasticity index between 7 and 20. For pavement subgrade, select fill will serve as an equal to soil treated with lime in accordance with Section 32 11 13.13 – Lime Treatment for Subgrade, to meet plasticity criteria.
- 2.3 Imported Fill: Random Backfill is acceptable as follows - Any suitable soil or mixture of soils within Classes I, II, III and IV; or fat clay (CH) where allowed by the applicable fill or backfill installation specification. Refer to Section 31 23 16.16 - Excavation and Backfill for Minor Structures.
 - A. Excavation and Backfill for Utilities. If Random backfill is to be used for pavement subgrade, it shall be treated with lime in accordance with Section 32 11 13.13 – Lime Treatment for Subgrade, to meet plasticity criteria.

PART 3 - EXECUTION

3.1 GENERAL:

- A. Prior to commencing construction operations, the contractor shall make all the provisions necessary to assure the protection of all existing improvements, both onsite and offsite. Where identified, he shall protect trees, shrubs, planting and grass areas and shall make provisions for maintaining public travel in an acceptable manner.
- B. PROTECTION OF EXISTING IMPROVEMENTS. Before any excavation is started, adequate protection shall be provided for all lawns, trees, shrubs, landscape work, fences,

sidewalks, hydrants, utility poles, street, alley and driveway paving, curbs, storm sewers, ditches, headwalls, catch basins, surface inlets and all other improvements that are to remain in place. Such protection shall be provided as long as necessary to prevent damage from the Contractor's operations. Shrubs, bushes, small trees and flowers, which have to be removed to permit excavation for the waterline, shall be protected and replanted or replaced when the backfill is completed. The Contractor shall exercise every precaution to prevent damage to property within and outside easements.

- C. Any damage to driveways, buildings, fences, retaining walls, culverts, drains, paving, sidewalks, etc. which are removed or damaged during construction shall be repaired by contractor. Repair, restoration or replacements of any improvements damaged or removed shall be the obligation of the contractor at no additional cost to Owner.
- D. Contractor will obtain all necessary permits in public and private rights-of-way from the Owner or any other local regulatory authority, as required
- E. Drainage: Contractor shall make provisions for temporarily handling runoff on site, flows in existing water bodies, ditches, sewers, and trenches by employing pipes, flumes, or other approved methods at all times when his operations would, in any way, interfere with the natural functioning of said water bodies, ditches, sewers and drains. The contractor shall at all times during construction provide and maintain sufficient equipment for the lawful disposal of all ponding water, or water which enters excavations, to render such area firm and dry through the construction phase.

3.2 DISPOSAL OF EXCAVATED MATERIAL

- A. Contractor will utilize all of the excess excavated material, unless otherwise instructed. In such event, Contractor shall dispose of material off site at no cost to Owner. All material will be graded and compacted as shown on plans or as directed by Engineer.

3.3 DESCRIPTION

- A. Work shall consist of the required excavation and placement of excavated materials, and the placement and compaction of imported fill material, within the limits of the site as shown on the plans. The proper utilization of all excavated and imported fill material and the construction shaping and finishing of all earth work on the entire length of pavement, and all other areas within the site will be done in conformity with the required lines, grades, and typical cross sections in accordance with specification requirements herein outlined.

3.4 CONSTRUCTION METHODS

- A. All excavation and corresponding embankment construction shall be performed as specified herein and in the design plans and the completed site shall conform to the established alignment, grades and cross sections.
- B. When using either excavated material or imported soil material to perform fill or grading operations, each lift shall be mechanically compacted in 6" (six inch) layers to a minimum density of 90% Standard Proctor, for general areas. Engineer may select random areas for

density testing to confirm minimum compaction. In areas of street construction (subgrade) minimum density shall be 95%. For backfill of utilities (trenches) or structures, minimum density shall be as prescribed in the applicable specifications, or on the plans.

END OF SECTION

SECTION 312319

DEWATERING – CONTROL OF GROUND WATER AND SURFACE WATER

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Dewatering, depressurizing, draining, and maintaining trenches, shaft excavations, structural excavations, and foundation beds in a stable condition, and controlling ground water conditions for trench and tunnel excavations.
- B. Protecting work against surface runoff and rising flood waters.
- C. Disposing of removed water.

1.2 UNIT PRICES

- A. Unit Prices.
 - 1. Payment for control of groundwater, regardless of depth, size or number of well points or time required to lower groundwater, is on a linear foot basis measured along the centerline of the structure being installed.
 - 2. No payment will be made for excavation drainage under this Section. Include payment in unit price for applicable utility installation.
 - 3. No payment will be made for control of surface water or surface drainage under this Section. Include payment in unit price for applicable utility installation.

1.3 REFERENCES

- A. ASTM D 698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5-lb (2.49 kg) Rammer and 12-inch (304.8 mm) Drop.
- B. Federal Regulations, 29 CFR Part 1926, Standards-Excavation, Occupational Safety and Health Administration (OSHA).
- C. Federal Register 40 CFR (Vol. 55, No. 222) Part 122, EPA Administered Permit Programs (NPDES), Para.122.26(b)(14) Storm Water Discharge.

1.4 DEFINITIONS

- A. Ground water control includes both dewatering and depressurization of water-bearing soil layers.
 - 1. Dewatering includes lowering the water table and intercepting seepage which would otherwise emerge from slopes or bottoms of excavations, or into tunnels and shafts, and disposing of removed water. The intent of dewatering is to increase stability of tunnel

excavations and excavated slopes; prevent dislocation of material from slopes or bottoms of excavations; reduce lateral loads on sheeting and bracing; improve excavating and hauling characteristics of excavated material; prevent failure or heaving of the bottom of excavations; and to provide suitable conditions for placement of backfill materials and construction of structures and other installations.

2. Depressurization includes reduction in piezometric pressure within strata not controlled by dewatering alone, as required to prevent failure or heaving of excavation bottom or instability of tunnel excavations.
- B. Excavation drainage includes placement of drainage materials, such as crushed stone and filter fabric, together with sump pumping in order to keep excavations free of surface and seepage water.
 - C. Surface drainage includes use of temporary drainage ditches and dikes and installation of temporary culverts and sump pumps with discharge lines as required to protect the Work from any source of surface water.
 - D. Equipment and instrumentation for monitoring and control of the ground water control system includes piezometers and monitoring wells, and devices, such as flow meters, for observing and recording flow rates.

1.5 PERFORMANCE REQUIREMENTS

- A. Conduct subsurface investigations to identify groundwater conditions and to provide parameters for design, installation, and operation of groundwater control systems.
- B. Design a ground water control system, compatible with requirements of Federal Regulations 29 CFR Part 1926 and Section 31.41.33 - Trench Safety Systems, to produce the following results:
 1. Effectively reduce the hydrostatic pressure affecting:
 - a. Excavations.
 - b. Tunnel excavation, face stability or seepage into tunnels.
 2. Develop a substantially dry and stable subgrade for subsequent construction operations.
 3. Preclude damage to adjacent properties, buildings, structures, utilities, installed facilities, and other work.
 4. Prevent the loss of fines, seepage, boils, quick condition, or softening of the foundation strata.
 5. Maintain stability of sides and bottom of excavations.

- C. Provide ground water control systems may include single-stage or multiple-stage well point systems, deep wells, or combinations of these equipment types.
- D. Provide drainage of seepage water and surface water, as well as water from any other source entering the excavation. Excavation drainage may include placement of drainage materials, such as crushed stone and filter fabric, together with sump pumping.
- E. Provide ditches, berms, pumps and other methods necessary to divert and drain surface water from excavation and other work areas.
- F. Locate ground water control and drainage systems so as not to interfere with utilities, construction operations, adjacent properties, or adjacent water wells.
- G. Assume sole responsibility for ground water control systems and for any loss or damage resulting from partial or complete failure of protective measures and any settlement or resultant damage caused by the ground water control operations. Modify ground water control systems or operations if they cause or threaten to cause damage to new construction, existing site improvements, adjacent property, or adjacent water wells, or affect potentially contaminated areas. Repair damage caused by ground water control systems or resulting from failure of the system to protect property as required.
- H. Provide an adequate number of piezometers installed at the proper locations and depths as required to provide meaningful observations of the conditions affecting the excavation, adjacent structures, and water wells.
- I. Provide environmental monitoring wells installed at the proper locations and depths as required to provide adequate observations of hydrostatic conditions and possible contaminant transport from contamination sources into the work area or into the ground water control system.
- J. Decommission piezometers and monitoring wells installed during design phase studies and left for Contractors monitoring and use.

1.6 SUBMITTALS

- A. Submittals shall conform to requirements of Section 01 33 00 - Submittals.
- B. Submit a Ground Water and Surface Water Control Plan for review by the Owner and Engineer prior to start of any field work. The Plan shall be signed by a Professional Engineer registered in the State of Texas. Submit a plan to include the following:
 - 1. Results of subsurface investigation and description of the extent and characteristics of water bearing layers subject to ground water control.
 - 2. Names of equipment suppliers and installation subcontractors.

3. A description of proposed ground water control systems indicating arrangement, location, depth and capacities of system components, installation details and criteria, and operation and maintenance procedures.
 4. A description of proposed monitoring and control system indicating depths and locations of piezometers and monitoring wells, monitoring installation details and criteria, type of equipment and instrumentation with pertinent data and characteristics.
 5. A description of proposed filters including types, sizes, capacities and manufacturer's application recommendations.
 6. Design calculations demonstrating adequacy of proposed systems for intended applications. Define potential area of influence of ground water control operation near contaminated areas.
 7. Operating requirements, including piezometric control elevations for dewatering and depressurization.
 8. Excavation drainage methods including typical drainage layers, sump pump application and other necessary means.
 9. Surface water control and drainage installations.
 10. Proposed methods and locations for disposing of removed water.
- C. Submit the following records upon completed initial installation:
1. Installation and development reports for well points, eductors, and deep wells.
 2. Installation reports and baseline readings for piezometers and monitoring wells.
 3. Baseline analytical test data of water from monitoring wells.
 4. Initial flow rates.
- D. Submit the following records on a weekly basis during operations:
1. Records of flow rates and piezometric elevations obtained during monitoring of dewatering and depressurization. Refer to Paragraph 3.02, Requirements for Eductor, Well Points, or Deep Wells.
 2. Maintenance records for ground water control installations, piezometers, and monitoring wells.
- E. Submit the following records at end of work. Decommissioning (abandonment) reports for monitoring wells and piezometers installed by other during the design phase and left for Contractor's monitoring and use.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Comply with requirements of agencies having jurisdiction.
- B. Comply with Texas Natural Resource Conservation Commission regulations and Texas Water Well Drillers Association for development, drilling, and abandonment of wells used in dewatering system.
- C. Obtain permit from EPA under the National Pollutant Discharge Elimination System (NPDES), for storm water discharge from construction sites. Refer to Section 31 25 00 – Erosion & Sedimentation Controls TPDES Permit Requirements.
- D. Obtain all necessary permits from agencies with control over the use of groundwater and matters affecting well installation, water discharge, and use of existing storm drains and natural water sources. Because the review and permitting process may be lengthy, take early action to pursue and submit for the required approvals.
- E. Monitor ground water discharge for contamination while performing pumping in the vicinity of potentially contaminated sites.

PART 2 - PRODUCTS

2.1 EQUIPMENT AND MATERIALS

- A. Equipment and materials are at the option of Contractor as necessary to achieve desired results for dewatering. Selected equipment and materials are subject to review by the Owner and Engineer through submittals required in Paragraph 1.06, Submittals.
- B. Eductors, well points, or deep wells, where used, must be furnished, installed and operated by an experienced contractor regularly engaged in ground water control system design, installation, and operation.
- C. All equipment must be in good repair and operating order.
- D. Sufficient standby equipment and materials shall be kept available to ensure continuous operation, where required.

PART 3 - EXECUTION

3.1 GROUND WATER CONTROL

- A. Perform a subsurface investigation by borings as necessary to identify water bearing layers, piezometric pressures, and soil parameters for design and installation of ground water control systems. Perform pump tests, if necessary, to determine the drawdown characteristics of the water bearing layers. The results shall be presented in the Ground Water and Surface Water Control Plan (See Paragraph 1.06B.1).

- B. Provide labor, material, equipment, techniques and methods to lower, control and handle ground water in a manner compatible with construction methods and site conditions. Monitor effectiveness of the installed system and its effect on adjacent property.
- C. Install, operate, and maintain ground water control systems in accordance with the Ground Water and Surface Water Control Plan. Notify the Engineer in writing of any changes made to accommodate field conditions and changes to the Work. Provide revised drawings and calculations with such notification.
- D. Provide for continuous system operation, including nights, weekends, and holidays. Arrange for appropriate backup if electrical power is primary energy source for dewatering system.
- E. Monitor operations to verify that the system lowers ground water piezometric levels at a rate required to maintain a dry excavation resulting in a stable subgrade for prosecution of subsequent operations.
- F. Where hydrostatic pressures in confined water bearing layers exist below excavation, depressurize those zones to eliminate risk of uplift or other instability of excavation or installed works. Allowable piezometric elevations shall be defined in the Ground Water and Surface Water Control Plan.
- G. Remove ground water control installations.
 - 1. Remove pumping system components and piping when ground water control is no longer required.
 - 2. Remove piezometers, including piezometers installed during the design phase investigations and left for Contractor's use, upon completion of testing, in accordance with Section 33 31 11 Part 3.2 – Testing of Sanitary Sewer Pipe Work.
 - 3. Remove monitoring wells when directed by the Engineer.
 - 4. Grout abandoned well and piezometer holes. Fill piping that is not removed with cement-bentonite grout or cement-sand grout.
- H. During backfilling, dewatering may be reduced to maintain water level a minimum of 5 feet below prevailing level of backfill. However, do not allow that water level to result in uplift pressures in excess of 80 percent of downward pressure produced by weight of structure or backfill in place. Do not allow water levels to rise into cement stabilized sand until at least 48 hours after placement.
- I. Provide a uniform diameter for each pipe drain run constructed for dewatering. Remove pipe drain when it has served its purpose. If removal of pipe is impractical, provide grout connections at 50-foot intervals and fill pipe with cement-bentonite grout or cement-sand grout when pipe is removed from service.
- J. Extent of construction ground water control for structures with a permanent perforated underground drainage system may be reduced, such as for units designed to withstand

hydrostatic uplift pressure. Provide a means of draining the affected portion of underground system, including standby equipment. Maintain drainage system during operations and remove it when no longer required.

- K. Remove system upon completion of construction or when dewatering and control of surface or ground water is no longer required.
- L. Compact backfill to not less than 95 percent of the maximum dry density in accordance with ASTM D 698.

3.2 REQUIREMENTS FOR EDUCTOR, WELL POINTS, OR DEEP WELLS

- A. For aboveground piping in ground water control system, include a 12-inch minimum length of clear, transparent piping between every eductor well or well point and discharge header so that discharge from each installation can be visually monitored.
- B. Install sufficient piezometers or monitoring wells to show that all trench or shaft excavations in water bearing materials are pre-drain prior to excavation. Provide separate piezometers for monitoring of dewatering and for monitoring of depressurization. Install piezometers and monitoring wells for tunneling as appropriate for Contractor's selected method of work.
- C. Install piezometers or monitoring wells not less than one week in advance of beginning the associated excavation.
- D. Dewatering may be omitted for portions of underdrains or other excavations, but only where auger borings and piezometers or monitoring wells show that soil is pre-drained by an existing system such that the criteria of the ground water control plan are satisfied.
- E. Replace installations that produce noticeable amounts of sediments after development.
- F. Provide additional ground water control installations, or change the methods, in the event that the installations according to the ground water control plan does not provide satisfactory results based on the performance criteria defined by the plan and by the specification. Submit a revised plan according to Paragraph 1.06B.

3.3 EXCAVATION DRAINAGE

- A. Contractor may use excavation drainage methods if necessary, to achieve well-drained conditions. The excavation drainage may consist of a layer of crushed stone and filter fabric, and sump pumping in combination with sufficient wells for ground water control to maintain stable excavation and backfill conditions.

3.4 MAINTENANCE AND OBSERVATION

- A. Conduct daily maintenance and observation of piezometers or monitoring wells while the ground water control installations or excavation drainage are operating in an area or seepage into tunnel is occurring. Keep system in good condition.

- B. Replace damaged and destroyed piezometers or monitoring wells with new piezometers or wells as necessary to meet observation schedule.
- C. Cut off piezometers or monitoring wells in excavation areas where piping is exposed, only as necessary to perform observation as excavation proceeds. Continue to maintain and make observations, as specified.
- D. Remove and grout piezometers inside or outside the excavation area when ground water control operations are complete. Remove and grout monitoring wells when directed by the Engineer.

3.5 MONITORING AND RECORDING

- A. Monitor and record average flow rate of operation for each deep well, or for each wellpoint or eductor header used in dewatering system. Also monitor and record water level and ground water recovery. These records shall be obtained daily until steady conditions are achieved, and twice weekly thereafter.
- B. Observe and record elevation of water level daily as long as ground water control system is in operation, and weekly thereafter until the Work is completed or piezometers or wells are removed, except when Engineer determines that more frequent monitoring and recording are required. Comply with Engineer's direction for increased monitoring and recording and take measures as necessary to ensure effective dewatering for intended purpose.

3.6 SURFACE WATER CONTROL

- A. Intercept surface water and divert it away from excavations through use of dikes, ditches, curb walls, pipes, sumps or other approved means. The requirement includes temporary works required to protect adjoining properties from surface drainage caused by construction operations.
- B. Divert surface water and seepage water into sumps and pump it into drainage channels or storm drains, when approved by agencies having jurisdiction. Provide settling basins when required by such agencies.

END OF SECTION

SECTION 312323.13

EXCAVATION AND BACKFILL FOR UTILITIES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Excavation, trenching, foundation, embedment, and backfill for installation of utilities, including manholes and other pipeline structures.

1.2 MEASUREMENT AND PAYMENT

- A. Unit Prices.
 - 1. No additional payment will be made for trench excavation, embedment and backfill under this Section. Include cost in the unit price for installed underground piping, sewer, conduit, or duct work.
 - 2. No separate or additional payment will be made for surface water control, ground water control, or for excavation drainage. Include in the unit price for the installed piping, sewer, conduit, or duct work.

1.3 DEFINITIONS

- A. Pipe Foundation: Suitable and stable native soils that are exposed at the trench subgrade after excavation to depth of bottom of the bedding as shown on the Drawings, or foundation backfill material placed and compacted in over-excavations.
- B. Pipe Bedding: The portion of trench backfill that extends vertically from top of foundation up to a level line at bottom of pipe, and horizontally from one trench sidewall to opposite sidewall.
- C. Haunching: The material placed on either side of pipe from top of bedding up to springline of pipe and horizontally from one trench sidewall to opposite sidewall.
- D. Initial Backfill: The portion of trench backfill that extends vertically from springline of pipe (top of haunching) up to a level line 12 inches above top of pipe, and horizontally from one trench sidewall to opposite sidewall.
- E. Pipe Embedment: The portion of trench backfill that consists of bedding, haunching and initial backfill.
- F. Trench Zone: The portion of trench backfill that extends vertically from top of pipe embedment up to pavement subgrade or up to final grade when not beneath pavement.
- G. Unsuitable Material: Unsuitable soil materials are the following:

1. Materials that are classified as ML, CL-ML, MH, PT, OH, and OL according to ASTM D 2487.
 2. Materials that cannot be compacted to required density due to either gradation, plasticity, or moisture content.
 3. Materials that contain large clods, aggregates, stones greater than 4 inches in any dimension, debris, vegetation, waste or any other deleterious materials.
 4. Materials that are contaminated with hydrocarbons or other chemical contaminants.
- H. Suitable Material: Suitable soil materials are those meeting specification requirements. Unsuitable soils meeting specification requirements for suitable soils after treatment with lime or cement are considered suitable, unless otherwise indicated.
- I. Backfill: Suitable material meeting specified quality requirements, placed and compacted under controlled conditions.
- J. Ground Water Control Systems: Installations external to trench, such as well points, eductors, or deep wells. Ground water control includes dewatering to lower ground water, intercepting seepage which would otherwise emerge from side or bottom of trench excavation, and depressurization to prevent failure or heaving of excavation bottom. Refer to Section 31 23 19 - Control of Ground Water and Surface Water.
- K. Surface Water Control: Diversion and drainage of surface water runoff and rain water away from trench excavation. Rain water and surface water accidentally entering trench shall be controlled and removed as a part of excavation drainage.
- L. Excavation Drainage: Removal of surface and seepage water in trench by sump pumping and using a drainage layer, as defined in ASTM D 2321, placed on the foundation beneath pipe bedding or thickened bedding layer of Class I material.
- M. Trench Conditions are defined with regard to the stability of trench bottom and trench walls of pipe embedment zone. Maintain trench conditions that provide for effective placement and compaction of embedment material directly on or against undisturbed soils or foundation backfill, except where structural trench support is necessary.
1. Dry Stable Trench: Stable and substantially dry trench conditions exist in pipe embedment zone as a result of typically dry soils or achieved by ground water control (dewatering or depressurization) for trenches extending below ground water level.
 2. Stable Trench with Seepage: Stable trench in which ground water seepage is controlled by excavation drainage.
 - a. Stable Trench with Seepage in Clayey Soils: Excavation drainage is provided in lieu of or to supplement ground water control systems to control seepage and provide stable trench subgrade in predominately clayey soils prior to bedding placement.

- b. Stable Wet Trench in Sandy Soils: Excavation drainage is provided in the embedment zone in combination with ground water control in predominately sandy or silty soils.
- 3. Unstable Trench: Unstable trench conditions exist in the pipe embedment zone if ground water inflow or high water content causes soil disturbances, such as sloughing, sliding, boiling, heaving or loss of density.
- N. Subtrench: Subtrench is a special case of benched excavation. Subtrench excavation below trench shields or shoring installations may be used to allow placement and compaction of foundation or embedment materials directly against undisturbed soils. Depth of a subtrench depends upon trench stability and safety as determined by the Contractor.
- O. Trench Dam: A placement of low permeability material in pipe embedment zone or foundation to prohibit ground water flow along the trench.
- P. Over-Excavation and Backfill: Excavation of subgrade soils with unsatisfactory bearing capacity or composed of otherwise unsuitable materials below top of foundation as shown on Drawings, and backfilled with foundation backfill material.
- Q. Foundation Backfill Materials: Natural soil or manufactured aggregate of controlled gradation, and geotextile filter fabrics as required, to control drainage and material separation. Foundation backfill material is placed and compacted as backfill to provide stable support for bedding. Foundation backfill materials may include concrete seal slabs.
- R. Trench Safety Systems include both protective systems and shoring systems as defined in Section 31 41 33 - Trench Safety Systems.
- S. Trench Shield (Trench Box): A portable worker safety structure moved along the trench as work proceeds, used as a protective system and designed to withstand forces imposed on it by cave-in, thereby protecting persons within the trench. Trench shields may be stacked if so designed or placed in a series depending on depth and length of excavation to be protected.
- T. Shoring System: A structure that supports sides of an excavation to maintain stable soil conditions and prevent cave-ins, or to prevent movement of the ground affecting adjacent installations or improvements.
- U. Special Shoring: A shoring system meeting special shoring as specified in Paragraph 1.08, Special Shoring Design Requirements, for locations identified on the Drawings.

1.4 REFERENCES

- A. ASTM C 12 - Standard Practice for Installing Vitrified Clay Pipe Lines.
- B. ASTM D 558 - Test Methods for Moisture-Density Relations of Soil Cement Mixtures.
- C. ASTM D 698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5-lb (2.49-kg) Rammer and 12-in. (304.8-mm) Drop.

- D. ASTM D 1556 - Test Method for Density in Place by the Sand-Cone Method.
- E. ASTM D 2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity Flow Applications.
- F. ASTM D 2487 - Classification of Soils for Engineering Purposes.
- G. ASTM D 2922 - Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- H. ASTM D 3017 - Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
- I. ASTM D 4318 - Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- J. TxDOT Tex-101-E - Preparation of Soil and Flexible Base Materials for Testing.
- K. TxDOT Tex-110-E - Determination of Particle Size Analysis of Soils.
- L. Federal Regulations, 29 CFR Part 1926, Standards-Excavation, Occupational Safety and Health Administration (OSHA).

1.5 SCHEDULING

- A. Schedule work so that pipe embedment can be completed on the same day that acceptable foundation has been achieved for each section of pipe installation, manhole, or other structures.

1.6 SUBMITTALS

- A. Conform to Section 01 33 00 - Submittal Procedures.
- B. Submit a written description for information only of the planned typical method of excavation, backfill placement and compaction, including:
 - 1. Sequence of work and coordination of activities.
 - 2. Selected trench widths.
 - 3. Procedures for foundation and embedment placement, and compaction.
 - 4. Procedure for use of trench boxes and other pre-manufactured systems while assuring specified compaction against undisturbed soil.
 - 5. Procedure for installation of Special Shoring at locations identified on the Drawings.
- C. Submit a ground and surface water control plan in accordance with requirements in this Section and Section 31 23 19 – Dewatering - Control of Ground Water and Surface Water.

- D. Submit backfill material sources and product quality information in accordance with requirements of Section 31 06 20.16 - Utility Backfill Materials.
- E. Submit a trench excavation safety program in accordance with requirements of Section 31 41 33 - Trench Safety System. Include designs for special shoring meeting the requirements defined in Paragraph 1.08, Special Shoring Design Requirements.
- F. Submit record of location of utilities as installed, referenced to survey control points. Include locations of utilities encountered or rerouted. Give stations, horizontal dimensions, elevations, inverts, and gradients.

1.7 TESTS

- A. Density testing of compacted subgrade material for first coarse and second coarse of compacted base shall be made at all driveways and intersecting streets. In addition, one (1) density test per lift per five hundred (500) feet of installed pipeline shall be conducted.
- B. Testing and analysis of backfill materials for soil classification and compaction during construction will be performed by an independent laboratory provided by the Owner in accordance with requirements of Section 01 45 29 - Testing Laboratory Services and as specified in this Section.
- C. Perform backfill material source qualification testing in accordance with requirements of Section 32 23 23.16 - Utility Backfill Materials.

1.8 SPECIAL SHORING DESIGN REQUIREMENTS

- A. Have special shoring designed or selected by the Contractor's Professional Engineer to provide support for the sides of the excavations, including soils and hydrostatic ground water pressures as applicable, and to prevent ground movements affecting adjacent installations or improvements such as structures, pavements and utilities. Special shoring may be a pre-manufactured system selected by the Contractor's Professional Engineer to meet the project site requirements based on the manufacturer's standard design.

PART 2 - PRODUCTS

2.1 EQUIPMENT

- A. Perform excavation with hydraulic excavator or other equipment suitable for achieving the requirements of this Section.
- B. Use only hand-operated tamping equipment until a minimum cover of 12 inches is obtained over pipes, conduits, and ducts. Do not use heavy compacting equipment until adequate cover is attained to prevent damage to pipes, conduits, or ducts.

- C. Use trench shields or other protective systems or shoring systems which are designed and operated to achieve placement and compaction of backfill directly against undisturbed native soil.
- D. Use special shoring systems where required which may consist of braced sheeting, braced soldier piles and lagging, slide rail systems, or other systems meeting requirements as specified in Paragraph 1.09, Shoring Design Requirements.

2.2 MATERIAL CLASSIFICATIONS

- A. Embedment and Trench Zone Backfill Materials: Conform to classifications and product descriptions of Section 32 23 23.16 - Utility Backfill Materials.
- B. Concrete Backfill: Conform to requirements for Class B concrete as specified in Section 33 05 16 - Concrete for Utility Construction.
- C. Concrete for Trench Dams: Concrete backfill or 3 sack premixed (bag) concrete.
- D. Timber Shoring Left in Place: Untreated oak.

PART 3 - EXECUTION

3.1 STANDARD PRACTICE

- A. Install flexible pipe, including "semi-rigid" pipe, to conform to standard practice described in ASTM D 2321, and as described in this Section. Where an apparent conflict occurs between the standard practice and the requirements of this Section, this Section governs.
- B. Install rigid pipe to conform to standard practice described in ASTM C 12, and as described in this Section. Where an apparent conflict occurs between the standard practice and the requirements of this Section, this Section governs.
- C. Ditching machines will be permitted at Contractor's option, subject to the approval of the Owner, whenever their use is applicable and practical for work shown on the drawings. A certain amount of hand excavation may be required due to special field conditions and to minimize damage to improvements and trees.
- D. In compacting by rolling or operating heavy equipment parallel with the pipe, displacement of or injury to the pipe shall be avoided. Any pipe damaged thereby shall be repaired or replaced at the option of the OWNER and at the expense of the Contractor.

3.2 PREPARATION

- A. Establish traffic control to conform with requirements of Section 01 55 26 - Traffic Control and Regulation. Maintain barricades and warning lights for streets and intersections affected by the Work that is considered hazardous to traffic movements.

- B. Perform work to conform with applicable safety standards and regulations. Employ a trench safety system as specified in Section 31 41 33 - Trench Safety Systems.
- C. Immediately notify the agency or company owning any existing utility line which is damaged, broken, or disturbed. Obtain approval from the Owner and Utility Owner for any repairs or relocations, either temporary or permanent.
- D. Remove existing pavements and structures, including sidewalks and driveways, to conform with requirements of Section 02 41 13.13 - Removing Existing Pavements and Structures, as applicable.
- E. Install and operate necessary dewatering and surface water control measures to conform with Section 31 23 19 – Dewatering - Control of Ground Water and Surface Water.
- F. Maintain permanent benchmarks, monumentation, and other reference points. Unless otherwise directed in writing, replace those which are damaged or destroyed in accordance with Section 02 21 13 - Field Surveying.

3.3 PROTECTION

- A. Protect trees, shrubs, lawns, existing structures, and other permanent objects outside of grading limits and within the grading limits.
- B. Protect and support above-grade and below-grade utilities which are to remain.
- C. Restore damaged permanent facilities to pre-construction conditions unless replacement or abandonment of facilities are indicated on the Drawings.
- D. Take measures to minimize erosion of trenches. Do not allow water to pond in trenches. Where slides, washouts, settlements, or areas with loss of density or pavement failures or potholes occur, repair, recompact, and pave those areas at no additional cost to the Owner.

3.4 EXCAVATION

- A. Except as otherwise specified or shown on the Drawings, install underground utilities in open cut trenches with vertical sides.
- B. Perform excavation work so that pipe, conduit, and ducts can be installed to depths and alignments shown on the Drawings. Avoid disturbing surrounding ground and existing facilities and improvements.
- C. Determine trench excavation widths using the following schedule as related to pipe outside diameter (O.D.). Maximum trench width shall be the minimum trench width plus 24 inches.

Nominal
Pipe Size, Inches

Minimum Trench
Width, Inches

Less than 18
18 to 30
Greater than 30

O.D. + 18
O.D. + 24
O.D. + 36

- D. Use sufficient trench width or benches above the embedment zone for installation of well point headers or manifolds and pumps where depth of trench makes it uneconomical or impractical to pump from the surface elevation. Provide sufficient space between shoring cross braces to permit equipment operations and handling of forms, pipe, embedment and backfill, and other materials.
- E. Upon discovery of unknown utilities, badly deteriorated utilities not designated for removal, or concealed conditions, discontinue work at that location. Notify the Owner and obtain instructions before proceeding.
- F. Shoring of Trench Walls.
1. Install Special Shoring in advance of trench excavation or simultaneously with the trench excavation, so that the soils within the full height of the trench excavation walls will remain laterally supported at all times.
 2. For all types of shoring, support trench walls in the pipe embedment zone throughout the installation. Provide trench wall supports sufficiently tight to prevent washing the trench wall soil out from behind the trench wall support.
 3. Unless otherwise directed by the Owner, leave sheeting driven into or below the pipe embedment zone in place to preclude loss of support of foundation and embedment materials. Leave rangers, walers, and braces in place as long as required to support sheeting, which has been cut off, and the trench wall in the vicinity of the pipe zone.
 4. Employ special methods for maintaining the integrity of embedment or foundation material. Before moving supports, place and compact embedment to sufficient depths to provide protection of pipe and stability of trench walls. As supports are moved, finish placing and compacting embedment.
 5. If sheeting or other shoring is used below top of the pipe embedment zone, do not disturb pipe foundation and embedment materials by subsequent removal. Maximum thickness of removable sheeting extending into the embedment zone shall be the equivalent of a 1-inch-thick steel plate. Fill voids left on removal of supports with compacted backfill material.
- G. Use of Trench Shields. When a trench shield (trench box) is used as a worker safety device, the following requirements apply:
1. Make trench excavations of sufficient width to allow shield to be lifted or pulled freely, without damage to the trench sidewalls.
 2. Move trench shields so that pipe, and backfill materials, after placement and compaction, are not damaged nor disturbed, nor the degree of compaction reduced.

3. When required, place, spread, and compact pipe foundation and bedding materials beneath the shield. For backfill above bedding, lift the shield as each layer of backfill is placed and spread. Place and compact backfill materials against undisturbed trench walls and foundation.
4. Maintain trench shield in position to allow sampling and testing to be performed in a safe manner.

3.5 HANDLING EXCAVATED MATERIALS

- A. Use only excavated materials which are suitable as defined in this Section and conforming with Section 32 23 23.16 - Utility Backfill Materials. Place material suitable for backfilling in stockpiles at a distance from the trench to prevent slides or cave-ins.
- B. When required, provide additional backfill material conforming with requirements of Section 32 23 23.16 - Utility Backfill Materials.
- C. Do not place stockpiles of excess excavated materials on streets and adjacent properties. Protect excess stockpiles for use on site. Maintain site conditions in accordance with Section 31 10 00 – Site Clearing – Preparation of Site.

3.6 GROUND WATER CONTROL

- A. Implement ground water control according to Section 31 23 19 – Dewatering - Control of Ground Water and Surface Water. Provide a stable trench to allow installation in accordance with the Specifications.

3.7 TRENCH FOUNDATION

- A. Excavate bottom of trench to uniform grade to achieve stable trench conditions and satisfactory compaction of foundation or bedding materials.
- B. Place trench dams in Class I foundations in line segments longer than 100 feet between manholes, and not less than one in every 500 feet of pipe placed. Install additional dams as needed to achieve workable construction conditions. Do not place trench dams closer than 5 feet from manholes.

3.8 PIPE EMBEDMENT, PLACEMENT, AND COMPACTION

- A. Immediately prior to placement of embedment materials, the bottoms and sidewalls of trenches shall be free of loose, sloughing, caving, or otherwise unsuitable soil.
- B. Place embedment including bedding, haunching, and initial backfill as shown on Drawings.
- C. For pipe installation, manually spread embedment materials around the pipe to provide uniform bearing and side support when compacted. Do not allow materials to free-fall from heights greater than 24 inches above top of pipe. Perform placement and compaction directly

against the undisturbed soils in the trench sidewalls, or against sheeting which is to remain in place.

- D. Do not place trench shields or shoring within height of the embedment zone unless means to maintain the density of compacted embedment material are used. If moveable supports are used in embedment zone, lift the supports incrementally to allow placement and compaction of the material against undisturbed soil.
- E. Place geotextile to prevent particle migration from the in-situ soil into open-graded (Class I) embedment materials or drainage layers.
- F. Do not damage coatings or wrappings of pipes during backfilling and compacting operations. When embedding coated or wrapped pipes, do not use crushed stone or other sharp, angular aggregates.
- G. Place haunching material manually around the pipe and compact it to provide uniform bearing and side support. If necessary, hold small-diameter or lightweight pipe in place during compaction of haunch areas and placement beside the pipe with sandbags or other suitable means.
- H. Install electrical conduit as directed in the design plans or as specified in other Sections.
- I. Shovel in-place and compact embedment material using pneumatic tampers in restricted areas, and vibratory-plate compactors or engine-powered jumping jacks in unrestricted areas. Compact each lift before proceeding with placement of next lift. Water tamping is not allowed.
- J. OPEN CUT BACKFILL - Backfilling of excavated trenches in open cut shall be commenced as soon as possible after the water or sewer line is laid and the jointing and alignment are approved, but not until authorized by the Owner.

BEDDING PROCEDURES - The following bedding procedures will be used for Polyvinyl Chloride (PVC) Pipe, Asbestos Cement Pipe and Vitrified Clay Pipe. Before pipes have been tested and approved, partial backfilling shall be done with approved material free from large clods.

When trench bottom is unstable, or when pipe is to be placed under groundwater (below water table), foundation preparation shall be required, preferably with ground water drawdown procedures. If drawdown equipment is not used or gravel stabilization or approved substitute shall be required and no pipe will be laid until stabilization is to the satisfaction of the Utility Owner.

Sand bedding shall meet Bank Run Sand as per Section 31 06 20.16 – Utility Backfill Materials.

Sand Bedding zone shall extend from a point at least 6 inches below bottom of pipe to a point at least 6 inches above top of pipe, as well as at least 6 inches on each side of pipe and shall be compacted to at least 90% of maximum density as determined by ASTM Standard D698, latest revision.

Sand bedding from 6 inches below bottom of pipe to bottom of pipe shall be placed in one lift and shall be mechanically tamped. Sand bedding from bottom of pipe to spring line of pipe shall be placed by hand in 4 inch lifts and shall be hand tamped with proper tools. Sand bedding from spring line of pipe to 6 inches above top of pipe shall be placed in 6 inch lifts and shall be hand tamped with proper tools.

Final Backfill Above Pipe Zone (6" Above Pipe or Conduit to base of roadway section or finished grade elevation). The backfill above the pipe zone shall be, unless otherwise indicated on the drawings, in accordance with the following.

1. Class "A" Mechanical Compaction. Trench under existing or proposed flexible pavements and gravel surfaces - place Type "D" (as per design plans) sand backfill material in layers not to exceed six (6) inches compacted measurement. Compact with mechanical tampers to a dry density of at least 95% of maximum density as determined by ASTM Standard D698, latest revision. Each layer, before compaction, shall be leveled and evenly distributed on both sides of the pipe so as not to disturb, displace or damage the water or sewer line in any way. When the material does not contain sufficient moisture to obtain thorough compaction, it shall be moistened or wetted as directed by the Utility Owner.
 2. Class "B" Mechanical Compaction. Trench under unimproved roadways, unsurfaced road shoulders, unimproved driveways and under turfed or seeded lawn areas - place Type "E" (as per design plans) excavated material in backfill layers not to exceed twelve (12) inches loose measurement. Compact with mechanical tampers to at least 90% of maximum density as determined by ASTM Standard D698, latest revision. Each layer, before compaction, shall be leveled and evenly distributed on both sides of the pipe so as not to disturb, displace or damage the water or sewer line in any way. When the material does not contain sufficient moisture to obtain thorough compaction, it shall be moistened or wetted as directed by the Utility Owner.
- K. SPECIAL BACKFILL CONDITIONS - The trenches need not be completely backfilled until all required pressure and leakage tests are performed and until the utilities system as installed conform to the requirements specified.

Trenches improperly backfilled shall be reopened to the depth required for proper compaction, and refilled and compacted as specified, or the condition shall be otherwise corrected as permitted by the Owner. The surface shall be restored to its original condition as nearly as practicable and as hereinafter specified. Immediately after the pipe, or utility lines, is bedded and joined, as indicated on the drawings or specified, the backfill material shall be deposited within the pipe zone in uniform layers not to exceed six (6) inches and at the proper moisture content. The layers shall be compacted with mechanical hand tampers or other approved equipment to the density herein specified. The backfill shall rise the same on each side of the pipe and coincidentally be tamped in layers until there is a cover of 12 inches over the top of the pipe. Walking or working over the pipe will not be permitted until the trench is backfilled to 12 inches above the pipe.

Where pavement on a State Highway or other system roadway is cut, final backfill material and pavement shall be replaced in accordance with Texas Department of Transportation

requirements.

Where pavement is cut in locations other than State Highways, whether gravel topping or hard surfaced, the surfacing shall be restored to its original finish and in equal condition and quantities as found at the beginning of construction. Trenches on hard surfaced roads and State Highways shall be backfilled to a density of 95% as determined by the American Association of State Highway Officials Method T99 for compaction and density of soils.

Successful Contractor shall determine all requirements of various controlling agencies in connection with backfilling, pavement replacement and general construction before starting construction.

In traffic areas including individual driveways, Contractor shall restore traffic surfaces to usable condition immediately upon completion of pipe installation. In such locations, Owner will rely upon hydrostatic test to determine acceptability of construction. All excess dirt from all construction work shall be disposed of promptly by Contractor, either by hauling or at directions of Owner.

- L. Place trench dams in Class I embedments in line segments longer than 100 feet between manholes, and not less than one in every 500 feet of pipe placed. Install additional dams as needed to achieve workable construction conditions. Do not place trench dams closer than 5 feet from manholes.

3.9 TRENCH ZONE BACKFILL PLACEMENT AND COMPACTION

- A. Place backfill for pipe or conduits and restore surface as soon as practicable. Leave only the minimum length of trench open as necessary for construction.
- B. Where damage to completed pipe installation work is likely to result from withdrawal of sheeting, leave the sheeting in place. Cut off sheeting 1.5 feet or more above the crown of the pipe. Remove trench supports within 5 feet from the ground surface.
- C. For water and sewer lines, backfill in trench zone, including auger pits, as per the design plans and section 3.8.J.
- D. When shown on Drawings, a random backfill of suitable material may be used in trench zone for trench excavations outside pavements.
- E. Backfill materials shall be placed in uniform layers and compacted to percentage of density hereinafter specified. Moisture shall be controlled between optimum and 2 percentage points over. Methods to secure optimum moisture content shall be Contractor's responsibility. Compacting equipment and method of compaction shall be the responsibility of Contractor and shall be such that uniform density will be obtained over entire area and depth of material being compacted. Fill material shall be thoroughly broken up before being spread into uniform layers.

Backfill not otherwise specified shall be compacted to at least 95% of maximum density as determined by ASTM Specification D698.

- F. For trench excavations outside pavements, a random backfill of suitable material may be used in the trench zone.
 - 1. Fat clays (CH) may be used as trench zone backfill outside paved areas at the Contractor's option. If the required density is not achieved, the Contractor, at his option and at no additional cost to the Owner, may use lime stabilization to achieve compaction requirements or use a different suitable material.
 - 2. Maximum 9-inch compacted lift thickness for clayey soils and maximum 12-inch lift thickness for granular soils.
 - 3. Compact to a minimum of 90 percent of the maximum dry density determined according to ASTM D 698.
 - 4. Moisture content as necessary to achieve density.
- G. For electric conduits, remove formwork used for construction of conduits before placing trench zone backfill.

3.10 MANHOLES, JUNCTION BOXES, AND OTHER PIPELINE STRUCTURES

- A. Meet the requirements of adjoining utility installations for backfill of pipeline structures, as shown on the Drawings.

3.11 FIELD QUALITY CONTROL

- A. Test for material source qualifications as defined in Section 31 06 20.16 - Utility Backfill Materials.
- B. Provide excavation and trench safety systems at locations and to depths required for testing and retesting during construction at no additional cost to Owner.
- C. Tests will be performed on a minimum of three different samples of each material type for plasticity characteristics, in accordance with ASTM D 4318, and for gradation characteristics, in accordance with Tex-101-E and Tex-110-E. Additional classification tests will be performed whenever there is a noticeable change in material gradation or plasticity.
- D. At least three tests for moisture-density relationships will be performed initially for backfill materials in accordance with ASTM D 698, and for cement- stabilized sand in accordance with ASTM D 558. Additional moisture-density relationship tests will be performed whenever there is a noticeable change in material gradation or plasticity.
- E. In-place density tests of compacted pipe foundation, embedment and trench zone backfill soil materials will be performed according to ASTM D 1556, or ASTM D 2922 and ASTM D 3017, and at the following frequencies and conditions.
 - 1. A minimum of one test for every 20 cubic yards of compacted embedment and for every 50 cubic yards of compacted trench zone backfill material.

2. A minimum of three density tests for each full shift of Work.
 3. Density tests will be distributed among the placement areas. Placement areas are: foundation, bedding, haunching, initial backfill and trench zone.
 4. The number of tests will be increased if inspection determines that soil type or moisture content are not uniform or if compacting effort is variable and not considered sufficient to attain uniform density, as specified.
 5. Density tests may be performed at various depths below the fill surface by pit excavation. Material in previously placed lifts may therefore be subject to acceptance/rejection.
 6. Two verification tests will be performed adjacent to in-place tests showing density less than the acceptance criteria. Placement will be rejected unless both verification tests show acceptable results.
 7. Recompacted placement will be retested at the same frequency as the first test series, including verification tests.
- F. Recondition, recompact, and retest at Contractor's expense if tests indicate Work does not meet specified compaction requirements. For hardened soil cement with nonconforming density, core and test for compressive strength at Contractor's expense.
 - G. Acceptability of crushed rock compaction will be determined by inspection.
 - H. Determination of density of backfill, shall be made in conformance with the requirements of ASTM D2922, ASTM D1556 or ASTM D2167.
 - I. Determination of density of cohesionless material shall be made in accordance with ASTM D2049. Relative density of 75% shall be considered as satisfactory for cohesionless material.
 - J. Testing shall be performed by a soil consultant employed by the Owner and at no expense to the Contractor to test compaction of backfill material. When soil tests indicate densities less than those specified by this section, the material shall be recompacted and tested at the Contractor's expense.

3.12 DISPOSAL OF EXCESS MATERIAL

- A. Dispose of excess materials in accordance with all applicable local and state regulations and as required in the contract documents.
- B. The Contractor shall restore or replace all removed or damaged paving, curbing sidewalks, gutters, shrubbery, fences, sod, or other disturbed surfaces of structures in a condition equal to that before the work began and to the satisfaction of the Owner and shall furnish all labor and material incidental thereto, in restoring improved surfaces, new pavement shall be laid. No permanent surface shall be placed within 30 days after the backfilling has been completed, except by order of the Owner.

- C. Surplus pipeline material, tools and temporary structures shall be removed by the Contractor. All dirt, rubbish, and excess earth from excavations shall be hauled to a dump provided by the Contractor, and the construction site shall be left clean, to the satisfaction of the Owner.

END OF SECTION

SECTION 312500

EROSION & SEDIMENTATION CONTROLS – TPDES REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. This Section describes the required documentation to be prepared and signed by the Contractor before conducting construction operations, in accordance with the terms and conditions of the General Permit Number TXR150000 for discharges of storm water runoff from small construction sites.
- B. The Contractor shall be responsible for implementing the Storm Water Pollution Prevention Plan prepared for this project.
- C. Contractor shall review implementation of the Storm Water Pollution Prevention Plan (SWPPP) in a meeting with the Owner and Engineer prior to start of construction.

1.2 UNIT PRICES

- A. Unless prescribed elsewhere in the Contract Documents, payment for this item shall be made on a lump sum basis, and shall cover the preparation and submittal of all required forms, payment of permit fees (if any), cost of implementation and maintenance of the storm water control measures as required throughout the project.

1.3 REFERENCES

- A. Part II.E.2. of TCEQ General Permit Number TXR150000.
- B. Part II.F.3 of TCEQ General Permit Number TXR150000 (notification of MS4 operator)

PART 2 - PRODUCTS - As required by Storm Water Pollution Prevention Plan.

PART 3 - EXECUTION

3.1 NOTICE OF INTENT

- A. The Contractor shall complete and sign a Notice of Intent (NOI) as “Operator” and submit it along with all required fees to TCEQ, the Owner, Engineer, City of South Padre Island, and Laguna Madre Water District.
- B. A copy of the TCEQ’s TPDES storm water general construction permit TXR150000 acknowledgement certificate shall be submitted to Owner, Engineer, City of South Padre Island, and Laguna Madre Water District and shall be posted at the construction site, as specified.

3.2 STORM WATER POLLUTION PREVENTION PLAN

- A. Contractor shall be responsible for implementation, maintenance, and inspection of storm water pollution prevention control measures including, but not limited to, erosion and sediment controls, storm water management plans, waste collection and disposal, off-site vehicle tracking, and other practices shown on the Storm Water Pollution Prevention Plan, or as specified by TCEQ or elsewhere in this or other Specifications.

3.3 RETENTION OF RECORDS

- A. The Contractor shall keep a copy of the Storm Water Pollution Prevention Plan at the construction site or at the Contractor's office from the date that it became effective to the date of project completion.
- B. At project closeout, the Contractor shall submit to TCEQ a Notice of Termination (NOT) form, along with all applicable fees. Copy of SWPPP and certificate or letter of acknowledgement from TCEQ, and all storm water pollution prevention records and data will be turned over and retained by Owner for a period of 3 years from the date of project completion.

3.4 REQUIRED NOTICES

- A. The following notices shall be posted from the date that this SWPPP goes into effect until the date of final site stabilization:
 - 1. TCEQ's TPDES storm water general construction permit TXR150000 acknowledgement certificate.
 - 2. Notice to drivers of equipment and vehicles, instructing them to stop, check, and clean tires of debris and mud before driving onto traffic lanes. Post such notices at every stabilized construction exit area.
 - 3. In an easily visible location on site, post a notice of waste disposal procedures.
 - 4. If applicable, notice of hazardous material handling and emergency procedures shall be posted on site. Keep copies of Material Safety Data Sheets at a location on site that is known to all personnel.
 - 5. Keep a copy of each signed certification at the construction site or at Contractor's office.

END OF SECTION

SECTION 314133
TRENCH SAFETY SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Trench safety system for the construction of trench excavations.
- B. Trench safety system for structural excavations which fall under provisions of State and Federal trench safety laws.

1.2 UNIT PRICES

- A. Payment for this item shall be made on a lump sum basis and shall cover an approved trench safety system plan prepared and sealed by a Texas licensed professional engineer and as per OSHA 29CFR. Costs associated with any changes or revisions to the Contractor's Trench Safety Plan shall be borne on by the Contractor.
- B. Payment for trench safety systems used on trench excavations of greater than 5-foot depth is on a linear foot basis measured along the centerline of the trench.

1.3 DEFINITIONS

- A. A trench shall be defined as a narrow excavation (in relation to its depth) 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.
- B. The trench safety system requirements will apply to larger open excavations if the erection of structures or other installations limits the space between the excavation slope and these installation to dimensions equivalent of a trench as defined.
- C. Trench Safety Systems include but are not limited to sloping, sheeting, trench boxes or trench shields, sheet piling, cribbing, bracing, shoring, dewatering or diversion of water to provide adequate drainage.

1.4 SUBMITTALS

- A. Submittals shall conform to requirements of Section 01 33 00 - Submittal Procedures.
- B. Submit a safety program specifically for the construction of trench excavation. Design the trench safety program to be in accordance with OSHA 29CFR standards governing the presence and activities of individuals working in and around trench excavations.
- C. Construction and shop drawings containing deviations from OSHA standards or special designs shall be sealed by a licensed Engineer retained and paid by the Contractor.

- D. Review of the safety program by the Owner or Engineer will only be regarding compliance with this specification and will not constitute approval by the Owner or Engineer nor relieve Contractor of obligations under State and Federal trench safety laws.

1.5 REGULATORY REQUIREMENTS

- A. Install and maintain trench safety systems in accordance with the detail specifications set out in the provision of Excavations, Trenching, and Shoring, Federal Occupation Safety and Health Administration (OSHA) Standards, 29CFR, Part 1926, Subpart P, as amended, including Final Rule, published in the Federal Register Vol. 54, No. 209 on Tuesday, October 31, 1989. The sections that are incorporated into these specifications by reference include Sections 1926-650 through 1926-652.
- B. A reproduction of the OSHA standards included in "Subpart P - Excavations" from the Federal Register Vol. 54, No. 209 in which the Contractor is responsible for obtaining a copy of this section of the Federal Register.
- C. Legislation that has been enacted by the Texas Legislature regarding Trench Safety Systems, is hereby incorporated, by reference, into these specifications. Refer to Texas Health and Safety Code Ann., §756.021 (Vernon 1991).

1.6 INDEMNIFICATION

- A. Contractor shall indemnify and hold harmless the Owner, Engineer and their employees and agents, from any and all damages, costs (including, without limitation, legal fees, court costs, and the cost of investigation), judgements or claims by anyone for injury or death of persons resulting from the collapse or failure of trenches constructed under this Contract.
- B. Contractor acknowledges and agrees that this indemnity provision provides indemnity for the Owner and Engineer in case the Owner or Engineer are negligent either by act or omission in providing for trench safety, including, but not limited to safety program and design reviews, inspections, failures to issue stop work orders, and the hiring of the Contractor.

PART 2 - PRODUCTS – [NOT USED]

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install and maintain trench safety systems in accordance with provisions of OSHA 29CFR.
- B. Install specially designed trench safety systems in accordance with the Contractor's trench excavation safety program for the locations and conditions identified in the program.

- C. A competent person, as identified in the Contractor's Trench Safety Program, shall verify that trench boxes and other pre-manufactured systems are certified for the actual installation conditions.

3.2 INSPECTION

- A. Contractor, or Contractor's independently retained consultant, shall make daily inspections of the trench safety systems to ensure that the installed systems and operations meet OSHA 29CFR and other personnel protection regulations requirements.
- B. If evidence of possible cave-ins or slides is apparent, Contractor shall immediately stop work in the trench and move personnel to safe locations until the necessary precautions have been taken by Contractor to safeguard personnel entering the trench.
- C. Maintain a permanent record of daily inspections.

3.3 FIELD QUALITY CONTROL

- A. Contractor shall verify specific applicability of the selected or specially designed trench safety systems to each field condition encountered on the project.

END OF SECTION

SECTION 316329

DRILLED PIERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Dry-installed straight shaft drilled piers with casings.
- B. Related Sections include the following:
 - 1. Division 3 – Section 033000 "Cast-In-Place Concrete" for general structural and building applications of concrete.

1.3 BASIS OF BIDS

- A. Base bids on indicated number of drilled piers; design length from top elevation to bottom of shaft, and diameter of shaft.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings Provide Electronic PDF's: For concrete reinforcement detailing fabricating, bending, and placing.
- C. Design Mixes: For each class of concrete. Include revised mix proportions when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
 - 1. Laboratory Test Reports: For evaluation of concrete materials and mix design.
- D. Welding certificates.
- E. Qualification Data: For Drilled Pier Subcontractor and testing agency.
- F. Record drawings at Project closeout according to Division 1 Section "Closeout Procedures."

1.5 QUALITY ASSURANCE

- A. Drilled-Pier Standard: Comply with provisions in ACI 336.1, "Reference Specifications for the Construction of Drilled Piers," unless modified in this Section.

- B. Survey Work: Engage a qualified land surveyor or professional engineer to perform surveys, layouts, and measurements for drilled piers. Before excavating, lay out each drilled pier to lines and levels required. Record actual measurements of each drilled pier's location, shaft diameter, bottom and top elevations, deviations from specified tolerances, and other specified data.
 - 1. Record and maintain information pertinent to each drilled pier and cooperate with Owner's testing and inspecting agency to provide data for required reports.
- C. Welding Standards: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1, "Structural Welding Code--Steel."
 - 2. AWS D1.4, "Structural Welding Code--Reinforcing Steel."
- D. Trial Drilled Pier: Construct trial drilled pier of diameter and depth and at location indicated or, if not indicated, of same diameter and depth as drilled piers located at least three diameters clear of permanent drilled piers, to demonstrate Installer's construction methods, equipment, standards of workmanship, and tolerances.
 - 1. Excavate shaft, install reinforcement, fill with concrete, and terminate trial drilled pier 30 inches below subgrade and leave in place.
 - 2. Install and remove temporary casings, as required.
 - 3. If Architect or Geotechnical Engineer determine that trial drilled pier does not comply with requirements, excavate for and cast another until it is accepted.
- E. Preinstallation Conference: Conduct conference at Project site.

1.6 PROJECT CONDITIONS

- A. Existing Utilities: Locate existing underground utilities before excavating drilled piers. If utilities are to remain in place, provide protection from damage during drilled-pier operations.
 - 1. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, adapt drilling procedure if necessary to prevent damage to utilities. Cooperate with Owner and utility companies in keeping services and facilities in operation without interruption. Repair damaged utilities to satisfaction of utility owner.
- B. Site Information: A geotechnical report has been prepared for this Project and is included elsewhere in the Project Manual for information only.

PART 2 - PRODUCTS

2.1 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.
- B. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), plain. Cut bars true to length with ends square and free of burrs.

2.2 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type II.
 - 1. Fly Ash Admixture: ASTM C 618, Class C.
- B. Normal-Weight Aggregate: ASTM C 33, uniformly graded, 1-inch maximum aggregate size.
- C. Water: Potable, complying with ASTM C 94/C 94M requirements.
- D. Admixtures: Certified by manufacturer to contain not more than 0.06 percent water-soluble chloride ions by mass of cementitious material and to be compatible with other admixtures and cementitious materials. Do not use admixtures containing calcium chloride.
 - 1. Water-Reducing Admixture: ASTM C 494, Type A.
 - 2. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.
 - 3. High-Range, Water-Reducing Admixture: ASTM C 494, Type G.
 - 4. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.
- E. Sand-Cement Grout: Portland cement, ASTM C 150, Type II; clean, natural sand, ASTM C 404; and water to result in grout with a minimum 28-day compressive strength of 1000 psi (6.9 MPa), of consistency required for application.

2.3 STEEL CASINGS

- A. Steel Pipe Casings: ASTM A 283/A 283M, Grade C; or ASTM A 36/A 36M, carbon-steel plate, with joints full-penetration welded according to AWS D1.1.

2.4 CONCRETE MIX

- A. Prepare design mixes according to ACI 211.1 and ACI 301 for each type and strength of concrete determined by either laboratory trial mix or field test data bases.
 - 1. Use a qualified testing agency for preparing and reporting proposed mix designs for laboratory trial mix basis.
- B. Proportion mixes according to ACI 211.1 and ACI 301 to provide normal-weight concrete with the following properties:
 - 1. Compressive Strength (28 Days): **4,000 psi**
 - 2. Minimum Slump: Capable of maintaining the following slump until completion of placement:
 - a. 7 inches (+/- 1 inch).
 - 3. Do not air entrain concrete for drilled piers.
- C. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement according to ACI 301 limits as if concrete were exposed to deicing chemicals.

- D. Concrete-mix design adjustments may be considered if characteristics of materials, Project conditions, weather, test results, or other circumstances warrant. Resubmit and obtain approval of proposed changes to concrete-mix proportions.

2.5 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
 - 1. Do not add water to concrete mix after mixing.
 - 2. Maintain concrete temperature to not exceed 90 deg F (32 deg C).

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, vibration, and other hazards created by drilled-pier operations.

3.2 EXCAVATION

- A. Unclassified Excavation: Excavation is unclassified and includes excavation to bearing elevations regardless of character of materials or obstructions encountered.
 - 1. Obstructions: Unclassified excavation includes removal of unanticipated boulders, concrete, masonry, or other subsurface obstructions.
 - 2. Obstructions: Removal of unanticipated boulders, concrete, masonry, or other unforeseen obstructions that cannot be removed by conventional augers fitted with soil or rock teeth, drilling buckets of size, power, torque, and downthrust necessary for the Work, will be paid according to Contract provisions for changes in the Work.
- B. Classified Excavation: Excavation is classified as standard excavation, special excavation, and obstruction removal and includes excavation to bearing elevations, as follows:
 - 1. Standard excavation includes excavation accomplished with conventional augers fitted with soil or rock teeth, drilling buckets of size, power, torque, and downthrust necessary for the Work.
 - 2. Special excavation includes excavation that requires special equipment or procedures above or below indicated depth of drilled piers where drilled-pier excavation equipment used in standard excavation, operating at maximum power, torque, and downthrust, cannot advance the shaft.
 - a. Special excavation requires use of special rock augers, core barrels, air tools, blasting, or other methods of hand excavation.
 - b. Earth seams, rock fragments, and voids included in rock excavation area will be considered rock for full volume of shaft from initial contact with rock.

3. Obstructions: Removal of unanticipated boulders, concrete, masonry, or other unforeseen obstructions that cannot be removed by conventional augers fitted with soil or rock teeth, drilling buckets of size, power, torque, and downthrust necessary for the Work, will be paid according to Contract provisions for changes in the Work.
- C. Prevent surface water from entering excavated shafts. Conduct water to site drainage facilities.
- D. Excavate shafts for drilled piers to indicated elevations. Remove loose material from bottom of excavation.
 1. Excavate bottom of drilled piers to level plane within 1:12 tolerance.
 2. Remove water from excavated shafts before concreting.
 3. Excavate rock sockets of dimensions indicated.
 4. Cut series of grooves about perimeter of shaft to height from bottom of shaft, vertical spacing, and dimensions indicated.
- E. Notify and allow Owner's testing and inspecting agency to test and inspect bottom of excavation. If unsuitable bearing stratum is encountered, make adjustments to drilled piers as determined by Architect.
 1. Do not excavate shafts deeper than elevations indicated, unless approved by Architect.
 2. Additional authorized excavation will be paid according to Contract provisions for changes in the Work.
- F. Excavate shafts for closely spaced drilled piers and those occurring in fragile or sand strata, only after adjacent drilled piers are filled with concrete and allowed to set.
- G. Temporary Casings: Provide watertight steel casings of sufficient length and thickness to prevent water seepage into shaft; to withstand compressive, displacement, and withdrawal stresses; and to maintain stability of shaft walls.
 1. Remove temporary casings, maintained in plumb position, during concrete placement and before initial set of concrete.
- H. Tolerances: Construct drilled piers to remain within ACI 336.1 tolerances.
 1. If location or out-of-plumb tolerances are exceeded, provide corrective construction. Submit design and construction proposals to Architect for review before proceeding.
- I. Inspection: Each drilled pier must be inspected and tested by Owner's testing and inspecting agency before placing concrete.
 1. Provide and maintain facilities with equipment required for testing and inspecting excavations. Cooperate with testing and inspecting personnel to expedite the Work.
 2. Notify Architect and testing agency at least 24 hours before excavations are ready for tests and inspections.

3.3 STEEL REINFORCEMENT

- A. Comply with recommendations in CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

- B. Clean reinforcement of loose rust and mill scale, earth, and other materials that reduce or destroy bond with concrete.
- C. Fabricate and install reinforcing cages symmetrically about axis of shafts in a single unit.
- D. Accurately position, support, and secure reinforcement against displacement during concreting. Maintain minimum cover to reinforcement.
- E. Use templates to set anchor bolts, leveling plates, and other accessories furnished in work of other Sections. Provide blocking and holding devices to maintain required position during final concrete placement.
- F. Protect exposed ends of extended reinforcement, dowels, or anchor bolts from mechanical damage and exposure to weather.

3.4 CONCRETE PLACEMENT

- A. Place concrete in continuous operation and without segregation immediately after inspection and approval of shaft by Owner's independent testing and inspecting agency.
 - 1. Construct a construction joint if concrete placement is delayed more than one hour. Level top surface of concrete. Before placing remainder of concrete, clean surface laitance, roughen, and slush concrete with commercial bonding agent or with sand- cement grout mixed at ratio of 1:1.
- B. Dry Method: Place concrete to fall vertically down the center of drilled pier without striking sides of shaft or steel reinforcement.
 - 1. Where concrete cannot be directed down shaft without striking reinforcing, place concrete with chutes, tremies, or pumps.
 - 2. Vibrate top 60 inches of concrete.
- C. Coordinate withdrawal of temporary casings with concrete placement to maintain at least a 60-inch head of concrete above bottom of casing.
 - 1. Vibrate top 60 inches of concrete after withdrawal of temporary casing.
- D. Screed concrete at cutoff elevation level and apply scoured, rough finish. Where cutoff elevation is above the ground elevation, form top section above grade and extend shaft to required elevation.
- E. Protect concrete work, according to ACI 301, from hot and cold temperatures that could cause physical damage or reduced strength.
 - 1. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 - 2. Do not use calcium chloride, salt, or other mineral-containing antifreeze agents or chemical accelerators.
- F. When hot-weather conditions exist that would seriously impair quality and strength of concrete, place concrete according to ACI 301 to maintain delivered temperature of concrete at no greater than 90 deg F (32 deg C).

1. Place concrete immediately on delivery. Keep exposed concrete surfaces and formed shaft extensions moist by fog sprays, wet burlap, or other effective means for a minimum of seven days.

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit reports during excavation and concrete placement for drilled piers.
- B. A drilled-pier report will be prepared by Owner's testing and inspecting agency for each drilled pier as follows:
 1. Actual top and bottom elevations.
 2. Top of rock elevation.
 3. Description of soil materials.
 4. Description, location, and dimensions of obstructions.
 5. Final top centerline location and deviations from requirements.
 6. Variation of shaft from plumb.
 7. Shaft excavating method.
 8. Design and tested bearing capacity of bottom.
 9. Depth of rock socket.
 10. Levelness of bottom and adequacy of cleanout.
 11. Ground-water conditions and water-infiltration rate, depth, and pumping.
 12. Description, diameter, and top and bottom elevations of temporary or permanent casings.
 13. Description of soil or water movement, sidewall stability, loss of ground, and means of control.
 14. Shaft dimensions and variations from original design.
 15. Date and time of starting and completing excavation.
 16. Inspection report.
 17. Position of reinforcing steel.
 18. Concrete placing method, including elevation of consolidation and delays.
 19. Elevation of concrete during removal of casings.
 20. Locations of construction joints.
 21. Remarks, unusual conditions encountered, and deviations from requirements.
 22. Concrete testing results.
- C. Soil Testing: Bottom elevations, bearing capacities, and lengths of drilled piers indicated have been estimated from available soil data. Actual elevations and drilled-pier lengths and bearing capacities will be determined by Owner's testing and inspecting agency. Final evaluations and approval of data will be determined by Architect.
 1. Bearing Stratum Tests: Owner's testing agency will take undisturbed core samples from drilled-pier bottoms; test each sample for compression, moisture content, and density; and report results and evaluations.
- D. Concrete: Sampling and testing of concrete for quality control may include the following:
 1. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94/C 94M.

- a. Slump: ASTM C 143/C 143M; one test at point of placement for each compressive-strength test, but no fewer than one test for each concrete load.
 - b. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each set of compressive-strength specimens.
 - c. Compression Test Specimens: ASTM C 31/C 31M; one set of four standard cylinders for each compressive-strength test, unless otherwise indicated. Mold and store cylinders for laboratory-cured test specimens, unless field-cured test specimens are required.
 - d. Compressive-Strength Tests: ASTM C 39; one set for each drilled pier, but not more than one set for each truck load. One specimen will be tested at 7 days, 2 specimens will be tested at 28 days, and one specimen will be retained in reserve for later testing if required.
2. When frequency of testing will provide fewer than five strength tests for a given class of concrete, testing will be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 3. When strength of field-cured cylinders is less than 85 percent of companion laboratory- cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing in-place concrete.
 4. Strength level of concrete will be considered satisfactory if averages of sets of 3 consecutive strength test results equal or exceed specified compressive strength and no individual strength test result falls below specified compressive strength by more than 500 psi (3.45 MPa).
 5. Test results will be reported in writing to Architect, concrete manufacturer, and Contractor within 24 hours of testing. Reports of compressive-strength tests will contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, concrete type and class, location of concrete batch in drilled pier, design compressive strength at 28 days, concrete-mix proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
 6. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted but shall not be used as sole basis for acceptance or rejection.
 7. Additional Tests: Testing and inspecting agency will make additional tests of concrete when test results indicate concrete strengths or other requirements have not been met.
 - a. Continuous coring of drilled piers may be required, at Contractor's expense, when temporary casings have not been withdrawn within specified time limits or where observations of placement operations indicate deficient concrete quality, presence of voids, segregation, or other possible defects.

3.6 DISPOSAL OF MATERIALS

- A. Remove surplus excavated material and concrete and legally dispose of it off Owner's property.

END OF SECTION

**SECTION 320190
OPERATION AND MAINTENANCE OF PLANTING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Maintain plants in manner that promotes health, growth, color and appearance, to quality levels specified; replace dead, dying, and damaged plants at no extra cost to Owner.
 - 1. It is Contractor's responsibility to determine type and quantity of soil amendments and fertilizer required.
- B. Maintain newly planted landscape plants, including turf (lawns), turf (playfields), trees, shrubs, hedges, vines, ground cover, perennials, flowering bulbs, and annuals.
- C. Maintain established landscape plants, including turf (lawns), turf (playfields), trees, shrubs, hedges, vines, ground cover, perennials, flowering bulbs, and naturalized wildflowers.
- D. Renovate the following established landscape plants within the project boundaries: turf (lawns), turf (playfields), trees, regardless of size, shrubs, hedges, vines, ground cover, perennials, and naturalized wildflowers.
- E. Clean up landscaped areas.
- F. Maintenance Period: The time frame covered by these requirements is 90 days:
 - 1. Start Date: Project Date of Substantial Completion.

1.02 RELATED REQUIREMENTS

- A. Section 015713 - Temporary Erosion and Sediment Control.
- B. Section 312200 - Grading.
- C. Section 328423 - Underground Sprinklers.
- D. Section 329219 - Seeding.
- E. Section 329223 - Sodding.
- F. Section 329300 - Plants.

1.03 REFERENCE STANDARDS

- A. ANSI A300 Part 1 - American National Standard for Tree Care Operations - Tree, Shrub, and Other Woody Plant Management - Standard Practices (Pruning); 2017.
- B. ANSI Z133.1 - American National Standard for Arboricultural Operations - Safety Requirements; 2017.
- C. ASTM C602 - Standard Specification for Agricultural Liming Materials; 2020.
- D. ASTM D4972 - Standard Test Methods for pH of Soils; 2019.
- E. ASTM D5883 - Standard Guide for Use of Rotary Kiln Produced Expanded Shale, Clay or Slate (ESCS) as a Mineral Amendment in Topsoil Used for Landscaping and Related Purposes; 2018.

1.04 PROPOSAL SUBMITTALS

- A. Submit complete maintenance plan, showing:
 - 1. Irrigation volume and frequency.
 - 2. Fertilizer type, quantity, and schedule of application.
 - 3. Soil amendment type, quantity, and schedule of application.
 - 4. Personnel assigned, including supervisor.
 - 5. Inspection procedures, diagnostics, and remedies.
 - 6. Soil testing recommendations for planting and turf from testing lab.

1.05 SUBMITTALS

- A. See General Conditions Section within Contract Documents for submittal procedures.
- B. Soil Tests and Analysis: Submit report showing number of samples, test results, and recommendations for soil amendments and fertilizer.

- C. Product Data: Manufacturer's data sheets on each fertilizer, herbicide, pesticide, and other chemical material to be used, showing trade name, chemical composition, mixing instructions, recommended application rate, storage and handling instructions, and application instructions.
 - 1. Pesticides and Herbicides: Also include U.S. EPA registration number and Material Safety Data Sheets.
- D. Installer Qualifications: As specified.
- E. Site Reports: Include date, time, personnel, condition of plants, activities, temperature, precipitation, irrigation applied; record:
 - 1. Each visit for maintenance purposes.
 - 2. Volume of water applied and area applied to.
 - 3. Diagnosis for treatment of unhealthy plants.
 - 4. Pesticide application; provide all additional reports and recordkeeping required by law.
 - 5. Herbicide application; provide all additional reports and recordkeeping required by law.
 - 6. Removal of dead plants, with quantity and diagnosis.
 - 7. Replanting.
 - 8. Volume of bio-degradable debris composted.
 - 9. Volume of wood chips produced.
 - 10. Volume of debris removed from site.

1.06 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Maintenance Contractor: The contractual entity that performed the planting installation.
 - 2. Pruners: Certified member, or supervised by certified member, of International Society of Arboriculture.
 - 3. Pesticide Applicators: Certified by authorities having jurisdiction.
 - 4. Herbicide Applicators: Certified by authorities having jurisdiction.

PART 2 PRODUCTS

2.01 FERTILIZERS AND SOIL AMENDMENTS

- A. Fertilizers: Free flowing granular organic type containing nitrogen, phosphorus, and potassium, plus trace minerals and micro-nutrients; controlled release type is preferred.
 - 1. Determine type and quantity based on soil analysis.
 - 2. Turf Fertilizer: As specified in Section 329219.
 - 3. Non-Turf Plant Fertilizer: As specified in Section 329300.
- B. Soil Amendments: Type and quantity as required to achieve specified results, based on soil analysis.
- C. pH Adjuster: ASTM C602 Class O limestone.
- D. Sand: Clean and free of materials harmful to plants; 95 percent by weight, minimum, passing No.10 (sieve and 10 percent by weight, minimum, passing No.16 (sieve).
- E. Expanded Shale, Clay, or Slate: ASTM D5883, rotary kiln produced.
- F. Manure: Unleached horse, chicken, or cattle manure, well rotted, containing maximum 25 percent by volume of straw, sawdust, and other bedding materials and no chemicals or ingredients harmful to plants; heat treated to kill weed seeds.
- G. Bonemeal: Finely ground, steamed, with 2 to 4 percent nitrogen and 16 to 40 percent phosphoric acid.

2.02 APPLIED MATERIALS

- A. Antidessicants: Sprayable, water insoluble film-forming material that produces a moisture retarding barrier not removable by rain or snow.
 - 1. Film-Forming Temperature: Temperature commonly encountered out of doors during planting season.
 - 2. Moisture Vapor Transmission: 0.2 pounds per 24 hours at 70 percent humidity, maximum.

- B. Organic Mulch: Maintain general appearance of existing mulched areas; use one of the following types:
 - 1. Shredded hardwood ranging in size from 1/2 inch to one inch.
 - 2. Pine Straw
- C. Pine Straw
- D. Fungicides: US EPA Registered
 - 1. Microlife Natural Oil by San Jacinto Environmental Supply – Houston, TX (713) 957-0909
 - 2. Orange Oil
 - 3. Garlic Barrier + Microlife Super Seaweed
 - 4. Neem Oil
 - 5. EcoSmart Brand Insecticides
 - 6. Permaguard Fire Ant Control
- E. Fungicides: US EPA Registered
 - 1. Neem Oil
 - 2. Microlife Brown Patch 5-1-3 (713) 957-0909
 - 3. MicroGro CM Bio-Inoculant (713) 957-0909
 - 4. MicroGro Granular Bio-Inoculant (713) 957-0909
 - 5. Humic Acid (Diluted according to manufacturer's recommendation) (713) 957-0909 or
 - 6. Compost Tea. Blend created by approved soil scientist, upon lab testing of soil
- F. Herbicides for Use on Turf: U.S. EPA registered.
 - 1. Neem Oil
 - 2. Microlife Brown Patch 5-1-3 (713) 957-0909
 - 3. MicroGro CM Bio-Inoculant (713) 957-0909
 - 4. MicroGro Granular Bio-Inoculant (713) 957-0909
 - 5. Humic Acid (Diluted according to manufacturer's recommendation) (713) 957-0909 or Approved Equal
 - 6. Compost Tea. Blend created by approved soil scientist, upon lab testing of soil
- G. Herbicides for Use on Turf: U.S. EPA registered.
 - 1. Pre-Emergence Type: {CH#121707}.
 - 2. Post-Emergence Type:
 - a. Flame Weeder/Torch Gun
 - b. AgraLawn Crabgrass Killer (Dust)
 - c. 20% Vinegar
 - d. Microlife Humates Plus 0-0-4 (713) 957-0909
 - e. Black Jack 21 (713) 957-0909
 - f. Mirimichi Green (713) 957-0909
 - 3. Water: Suitable for irrigation; Meritage Home of Texas, LLC's water supply may be used.

PART 3 EXECUTION

3.01 EXAMINATION

- A. If soil analysis has not already been performed, take sufficient samples to obtain a comprehensive analysis; perform analysis in accordance with ASTM D4972.

3.02 LANDSCAPE MAINTENANCE - GENERAL

- A. Protect existing vegetation, pavements, and facilities from damage due to maintenance activities; restore damaged items to original condition or replace, at no extra cost to Owner.
- B. General Cleanup: Remove debris from all landscape areas at least once a week and from turf areas before each mowing.
 - 1. Debris consists of trash, rubbish, dropped leaves, downed branches and limbs of all sizes, dead vegetation, rocks, and other material not belonging in landscaped areas.
 - 2. Remove debris from site and dispose of properly.

- C. Watering, Soil Erosion, and Sedimentation Control: Comply with federal, state, local, and other regulations in force; prevent over-watering, run-off, erosion, puddling, and ponding.
 - 1. Repair temporary erosion control mechanisms provided by others.
 - 2. Repair eroded areas and replant, when caused by inadequate maintenance.
 - 3. Prevent sediment from entering storm drains.
- D. Trees: Exercise care to avoid girdling trees; provide protective collars if necessary; remove protective collars at end of maintenance period.
- E. Fertilizing: Apply fertilizer only when necessary.
 - 1. Turf
 - a. Early Spring: 20 lbs. ML 6-2-4 per 1,000 s.f. OR 5 lbs. ML Hybrid 20-0-5 per 1,000 sf
 - b. Late Spring: 10 lbs. ML Humates Plus 0-0-4 per 1,000 s.f.
 - c. Summer: 20 lbs. ML 6-2-4 per 1,000 s.f. OR 5 lbs. ML Hybrid 20-0-5 per 1,000 s.f
 - d. Fall: 20 lbs. ML 6-2-4 per 1,000 s.f. OR 20 lbs. ML Brown Patch per 1,000 s.f
 - 2. Shrubs
 - a. Spring: 20 lbs. ML Ultimate 8-4-6 per 1,000 s.f.
 - b. Summer: 20 lbs. ML Ultimate 8-4-6 per 1,000 s.f.
 - c. Fall: 20 lbs. ML 6-2-4 per 1,000 s.f.
 - d. Every 60 days during growing season: Foliar Spray ML Super Seaweed

3.03 SPRING: 20 LBS. ML ULTIMATE 8-4-6 PER 1,000 S.F.

- A. Earth Mound Watering Basins: Maintain in good condition and as required to permit efficient application of water without waste; reapply mulch if soil surface shows.
- B. Drainage Channels: Remove obstructions in gutters, catch basins, storm drain inlets, yard drains, swales, ditches, and overflows.
 - 1. Remove grates from catch basins to clean.
 - 2. Prevent encroachment of other vegetation on turfed surface drainage channels.
- C. Health Maintenance: Inspect all plants regularly for health:
 - 1. Eradicate diseases and damaging pests, regardless of severity or speed of effect.
 - 2. Treat accidental injuries and abrasions.
 - 3. If a plant is unhealthy but not yet dead, according to specified definitions, determine reason(s) and take remedial action immediately.
 - 4. Remove dead plants immediately upon determining that they are dead.
- D. Pesticide and Herbicide Application: Comply with manufacturer's instructions and recommendations and applicable regulations.
 - 1. Obtain Owner's approval prior to each application.
 - 2. Apply in manner to prevent injury to personnel and damage to property due to either direct spray or drifting, both on and off Owner's property.
 - 3. Use backflow preventers on hose bibbs used for mixing water; prevent spills.
 - 4. Inspect equipment daily before application; repair leaks, clogs, wear, and damage.
 - 5. Do not dispose of excess mixed material, unmixed material, containers, residue, rinse water, or contaminated articles on site; dispose of off site in legal manner.
 - 6. Rinse water may be used as mix water for next batch of same formulation.
 - 7. Contractor is responsible for all recordkeeping, submissions, and reports required by laws and regulations.
- E. Replanting: Perform replacement and replanting immediately upon removal of dead plant.

3.04 IRRIGATION

- A. Irrigation: Do not allow plants to wilt; apply water as required to supplement rainfall; do not waste water; do not water plants or areas not needing water; do not water during rainfall; shut off water flow when finished; repair leaks.
 - 1. Provide backflow preventers on hose bibbs used for irrigation hoses.

3.05 RENOVATION OF ESTABLISHED TURF

- A. Remove turf from around trees to radius of 18 inches from base of tree trunk. Cut turf out and remove; do not simply mow. Trim turf edge as specified.
- B. Trim perimeter of turf area and around intervening objects as specified under Turf Maintenance.
- C. Eliminate undesirable grasses and weeds. Remove as much thatch as possible.
- D. Aerate established turf at least once every two years by coring and pulling out soil plugs 2 to 3 inches deep and not more than 2 inches apart.
 - 1. Clean plugs from pavements immediately.
- E. Apply fertilizer over entire aerated area.
- F. Water as soon as possible after planting. Do not allow newly planted material to become dry.
- G. Begin normal mowing once grass reaches 1-1/2 times specified mowing height.

3.06 TURF MAINTENANCE

- A. Maintain turf in manner required to produce turf that is healthy, uniform in color and leaf texture, and free from weeds and other undesirable growth.
 - 1. Grass Density - Lawns: 20 plants per square foot, minimum.
 - 2. Bare Spots - Lawns: 2 percent of total area, maximum; 6 inches square, maximum.
 - 3. Keep turf relatively free of thatch, woody plant roots, diseases, nematodes, soil-borne insects, stones larger than 1 inch in diameter, and other materials detrimental to grass growth.
 - 4. Limit broadleaf weeds and patches of foreign grass to a maximum of 2 percent of the total area.
- B. Mowing: During growing season(s) mow turf to uniform height, in manner that prevents scalping, rutting, bruising, and uneven or rough cutting.
 - 1. Prior to mowing clean all debris and leaves from turf surface.
 - 2. Schedule frequency of mowing so that no more than one-quarter to one-third of grass leaf length is removed during a cutting.
 - 3. Make each successive mowing at approximately 45 degrees to the previous mowing, if practical.
 - 4. Cool Season Grasses:
 - a. Reduce mowing height in fall and spring.
 - b. Use rotary type mowers; mulcher type mowers may be used.
 - 5. Warm Season Grasses:
 - a. Increase mowing height slightly as fall approaches.
 - b. Use reel type mowers; do not use mulcher mowers.
- C. Summer Mowing Height for Lawns:
 - 1. Bermuda, Common: 2 inches.
 - 2. Bermuda, Hybrid: 2 inches.
 - 3. St. Augustine, Common: 3 inches.
 - 4. St. Augustine, Improved: 3 inches.
- D. Trimming: Immediately after each mowing, neatly trim perimeter of each turf area and around obstructions within turf area; match height and appearance of adjacent turf.
 - 1. Adjacent to Pavements: Cut edges of turf to form a distinct, uniform turf edge.
 - 2. Adjacent to Planting Beds and Permanently Mulched Areas: Cut edges of turf to form a distinct, uniform turf edge.
 - 3. Around Other Trees and Poles: Where no planting bed or mulched area exists, trimming with string trimmer is acceptable.
 - 4. At Fences: Trim on both sides of fence.
 - 5. Irrigation Heads and Valve Boxes: Trim neatly so grass doesn't interfere with operation.
- E. Fertilizer: Apply as recommended by manufacturer and at rate indicated by soil analysis.
 - 1. Cool Season Grasses: Apply at least once, in Fall before first frost; do not apply high nitrogen fertilizer during Summer; Spring application is optional but must be reduced in

quantity.

3.07 PLANTING BED MAINTENANCE

- A. Planting beds include all planted areas except turf.
- B. Begin maintenance immediately after plants have been installed; inspect at least once a week and perform needed maintenance promptly.
- C. Keep planting beds free of pests; remove weeds and grass by hand before reaching 1 inch height.
- D. Do not allow climbing, twining, or creeping plants to encroach into other species.
- E. Replace mulch as required and remove debris.

3.08 TREE AND SHRUB MAINTENANCE

- A. Trees will be considered dead when main leader has died back or when 25 percent or more of crown has died ; except as otherwise indicated for palm trees.
- B. Shrubs will be considered dead when 25 percent or more of plant has died.
- C. Inspect woody plants for health by scraping up to 1/16 inch square area of bark; no green cambium layer below bark shall be evidence of death.
- D. Adjust stakes, guys and turnbuckles, ties, and trunk wrap as required to promote growth and avoid girdling.
- E. Pruning: Unless otherwise indicated, prune only to maintain balanced natural shape; follow recommendations of ANSI A300 and ANSI Z133.1 and best local practices for species involved.
- F. Shrubs: Prune at least once during maintenance period at best time to influence ultimate shape and size for the particular species.
 - 1. Prune to balance the plant's form and according to its natural growth characteristics.
 - 2. Remove water shoots, suckers, and branches not complying with desired shape and size.
- G. Hedges: Trim to encourage growth into voids and gaps.
- H. Renovation of Established Shrubs: Prune and trim as required to improve shape and balance as appropriate to the particular species; remove dead, damaged, and diseased branches and limbs; do not remove excess growth except as follows:
 - 1. Remove growth in front of windows, above or obstructing entranceways and walkways, leaning against structures, and obstructing vision at street intersections.
- I. Renovation of Established Trees (Except Palm Trees):
 - 1. Remove dead, damaged, and diseased branches and limbs and structurally weak limbs that may be a safety hazard.
 - 2. Remove growth in front of windows, above or obstructing entranceways and walkways, and leaning against structures.
 - 3. Remove growth obstructing traffic signs or vision at street intersections.
 - 4. Remove branches that extend over buildings or otherwise endanger roofs.
 - 5. Remove low-hanging branches over vehicular traffic routes to height necessary to clear expected traffic including buses and moving vans.

3.09 CLEANING

- A. Remove fallen deciduous leaves in Fall; removal may wait until all leaves have fallen.
- B. Clean adjacent pavements of plant debris and other debris generated by maintenance activities.
- C. Remove and dispose of general cleanup debris and biodegradable debris in a proper manner; Owner's trash collection facilities may be used.
- D. Remove and dispose of general cleanup debris and biodegradable debris in a proper manner.
 - 1. Biodegradable Debris: Owner will designate a compost pile on site where biodegradable debris may be deposited; branches and bark are not considered biodegradable.

2. Branches and Bark: Owner will designate a wood chip storage area; machine-chip all branch and bark debris.
3. Non-Biodegradable Debris: Owner's trash collection facilities may be used.

END OF SECTION 320190

SECTION 321123

FLEXIBLE BASE - CRUSHED LIMESTONE

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This item shall govern the materials, placement compaction of Crushed Limestone Base to the lines and grades that are shown on the construction drawings. Crushed Limestone Base thickness for various pavement types are shown on the plans.

1.2 UNIT PRICES

- A. Unit Prices

1. Payment for crushed limestone flexible base is on a square yard basis at the thickness shown in the design plans.

1.3 MATERIAL

- A. The flexible base shall be Type A Grade 1 in accordance with the most recent version of the Texas Department of Transportation "Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges", Item 247 and meeting in the following requirements:
- B. Triaxial Class 1: Min. compressive strength, 45 at 0 psi lateral pressure and 175 at 15 psi lateral pressure.

<u>RETAINED ON SQUARE SIEVE NUMBER</u>	<u>PERCENT RETAINED</u>
1-3/4" (44 mm)	0
7/8" (22.23 mm)	10-35
3/8" (9.5 mm)	30-50
NUMBER 4 (4.75 mm)	45-65
NUMBER 40 (0.425mm)	70-85

- C. Material passing the Number 40 Sieve shall be known as "Binder Materials" and shall meet the following requirements:

Maximum Liquid Limits (L.L)	=	35
Maximum Plasticity Index (P.I.)	=	10
Wet Ball Mill (max)	=	40
California Bearing Ratio (min.)	=	100

- D. All aggregate retained on the Number 10 Sieve shall be comprised of only crushed limestone.
- E. The Contractor shall not place crushed limestone on the road bed until the Engineer has accepted the shaped and compacted subgrade.
- F. The Contractor must maintain the roadbed free of holes, ruts and depressions and in condition to receive the crushed limestone.
- G. The Contractor upon request shall provide certification that the material supplied meets the above requirements prior to delivery to the job site. Samples for testing of the material must be taken prior to the compaction operations.

1.4 CONSTRUCTION METHODS

- A. The flexible base material shall be placed on the approved subgrade in courses not to exceed six (6) inches compacted depth. It shall be the responsibility of the contractor that the required amount of material be delivered and uniformly spread and shaped. All material has been cut into the windrows, it shall be sprinkled, spread, shaped, and rolled in proper sequence to prevent segregation and as necessary for required compaction.
- B. The surface on completion shall be smooth and in conformity with typical sections and to the established lines and grades. Any deviation in excess of 1/4 inch in cross-section and in length of 16 feet measured longitudinally shall be corrected.
- C. Flexible base shall be compacted to an apparent dry density of not less than 98 percent of the maximum dry density as determined in accordance with ASTM Test method D698 (Standard Proctor). Tests for density will be made within 24 hours after compaction operations are completed. If the material fails to meet the density specified, it shall be reworked as necessary to meet the density required. Prior to placing any succeeding course of flexible base or surfacing on a previously completed course the density and moisture of the top three (3) inches of flexible base shall be checked and if the tests show the density to be more than 2 percent below the specified compaction and moisture content, it shall be reworked as necessary the density and moisture required.
- D. The first density and depth test at a specific location will be made by commercial testing laboratory, in accordance with 01 45 29, designated by the Owner and said tests shall be paid for the Owner. If the test fails, all other tests at the location shall be paid for by the Contractor, by deducting from the final payment.

END OF SECTION

SECTION 321313

CONCRETE PAVEMENT AND FLAT WORK

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This specification covers the requirements for concrete pavement, valley gutters, sidewalks, driveways, curbs and gutters, and handicap ramps. Concrete shall be composed of portland cement concrete and shall be placed in accordance with the lines and grades established by the Engineer and in conformance with the details shown on the plans.

1.2 UNIT PRICES

A. Unit Prices

1. Payment for concrete pavement is on a square foot basis at the thickness shown in the design plans.
2. Payment for concrete valley gutters is on a square foot basis at the thickness shown in the design plans.
3. Payment for sidewalks is on a square foot basis at the thickness shown in the design plans.
4. Payment for curb and gutters is on a linear foot basis at the thickness shown in the design plans. Measurement shall occur along the face of the curb at the gutter line regardless of each cross section.
5. Payment for driveways is on a square foot basis at the thickness shown in the design plans.
6. Payment for handicap ramps is on a per unit basis, regardless of the ramp type installed, as shown in the design plans. Detectable warning systems shall be included in the unit costs of the handicap ramp.

1.3 PRODUCTS

- A. **SAND BEDDING:** Bedding material shall be placed over approved, limed subgrade, as specified in the drawing details. Sand shall be Bank Run Sand or River Sand, as follows: Durable bank run sand classified as SP, SW, or SM by the Unified Soil Classification System (ASTM D 2487) meeting the following requirements:
 1. Less than 15 percent passing the number 200 sieve when tested in accordance with ASTM D 1140. The amount of clay lumps or balls not exceeding 2 percent.
 2. Material passing the number 40 sieve shall meet the following requirements when tested

in accordance with ASTM D 4318:

- a. Liquid limit: not exceeding 25 percent.
- b. Plasticity index: not exceeding 7.

Contractor shall provide reports to the Owner and the Engineer from an independent testing laboratory that backfill materials to be placed in the Work meet applicable specification requirements. Contractor shall assist Owner, Owner's representative and Testing Lab in obtaining samples, from the delivered materials, for verification testing.

- B. **CONCRETE:** Concrete shall conform to the details in the plans except as otherwise specified. Concrete shall have a minimum compressive strength of 3000 psi at 28 days or as shown in the design plans. Maximum size of aggregate shall be 1-1/2 inches. In climates where freezing is not a factor but where air entrainment is used in local commercial practice to improve the workability and place ability of concrete, concrete having air content percent of 4-1/2 plus or minus 1-1/2 percent may be specified as Contractor's option to non air-entrained concrete. Mixtures may have air content by volume of concrete of 5 to 7 percent, based on measurements made immediately after discharge from the mixer. The desired slump will be inserted. Suggested limits are 3 inches plus or minus 1 inch for hand placed concrete or for slip formed concrete. The concrete slump shall be 3 inches where determined in accordance with ASTM C 143.
- C. **REINFORCING STEEL:** Provide Grade 60 deformed steel for bar reinforcement in accordance with TXDOT Item 440, "Reinforcing Steel." Provide approved positioning and supporting devices (baskets and chairs) capable of securing and holding the reinforcing steel in proper position before and during paving. Provide corrosion protection when shown on the plans.
- D. **DOWELS:** Provide smooth, straight dowels of the size shown on the plans, free of burrs, and conforming to the requirements of Item 440, "Reinforcing Steel." Coat dowels with a thin film of grease or other approved de-bonding material. Provide dowel caps on the lubricated end of each dowel bar used in an expansion joint. Provide dowel caps filled with a soft compressible material with enough range of movement to allow complete closure of the expansion joint.
- E. **Tie Bars.** Provide straight deformed steel tie bars. Provide either multiple-piece tie bars or single-piece tie bars as shown on the plans. Provide multiple-piece tie bars composed of 2 pieces of deformed reinforcing steel with a coupling capable of developing a minimum tensile strength of 125% of the design yield strength of the deformed steel when tensile-tested in the assembled configuration. Provide a minimum length of 33 diameters of the deformed steel in each piece. Use multiple-piece tie bars from the list of "Prequalified Multiple Piece Tie Bar Producers" maintained by the Construction Division, or submit samples for testing in accordance with Tex-711-I.
- F. **Joint Filler Strips and Sealants:** Expansion Joints shall be located at maximum 40 foot spacing. Expansion joint filler shall consist of hard-pressed fiberboard. Joint sealant, cold

applied self-leveling shall be a premium grade polyurethane sealant (gray in color) or equal approved by the Engineer.

1.4 CONSTRUCTION METHODS

- A. **Placing During Warm Weather:** The air temperature of the concrete as placed shall not exceed 95 degrees F except where an approved retarder is used. The mixing water and/or aggregates shall be cooled, if necessary, to maintain a satisfactory placing temperature. In no case shall the placing air temperature exceed 100 degrees F.
- B. **FORM WORK:** Form work shall be designed and constructed to ensure that the finished concrete will conform accurately to the indicated dimensions, lines, and elevations, and within the tolerances specified. Forms shall be of wood or steel, straight, of sufficient strength to resist springing during depositing and consolidating concrete. Wood forms shall be surfaced plank, 2-inch nominal thickness, straight and free from warp, twist, loose knots, splits or other defects. Wood forms shall have a nominal length of 10 -12 feet. Radius bends may be formed with 3/4-inch boards, laminated to the required thickness. Steel forms shall be channel-formed sections with a flat top surface and with welded braces at each end and at not less than two intermediate points. Ends of steel forms shall be interlocking and self-aligning. Steel forms shall include flexible forms for radius forming, corner forms, form spreaders, and fillers. Steel forms shall have a nominal length of 10 feet with a minimum of two welded stake pockets per form. Stake pins shall be solid steel rods with chamfered heads and pointed tips designed for use with steel forms.
- C. **FORM SETTING:** Forms shall be carefully set to the indicated alignment, grade and dimensions. Forms shall be held rigidly in place by a minimum of three stakes per form placed at intervals not to exceed 4 feet. Corners, deep sections, and radius bends shall have additional stakes and braces, as required. Clamps, spreaders, and braces shall be used where required to insure rigidity in the forms. Forms shall be removed without injuring the concrete. Bars or heavy tools shall not be used against the concrete in removing the forms. Any concrete found defective after form removal shall be promptly and satisfactorily repaired. Forms shall be cleaned and coated with form oil each time before concrete is placed. Wood forms may, instead, be thoroughly wetted with water before concrete is placed, except that with probable freezing temperatures, oiling is mandatory. Forms for sidewalks shall be set with the upper edge true to line and grade with an allowable tolerance of 1/8 inch in any 10-foot long section. After forms are set, grade and alignment shall be checked with a 10-foot straightedge. Forms shall have a transverse slope [as indicated] 1/4-inch per foot with the low side adjacent to the roadway. Side forms shall not be removed for 18 hours after finishing has been completed.
- D. **CONCRETE PLACEMENT AND FINISHING:** Concrete shall be placed in the forms in one layer of such thickness that when consolidated and finished the sidewalks will be of the thickness indicated. After concrete has been placed in the forms, a strike-off guided by side forms shall be used to bring the surface to proper section to be compacted. The concrete shall be consolidated with an approved vibrator, and the surface shall be finished to grade with a wood float, bull float, or darby, edged and broom finished. After straight edging, when most of the water sheen has disappeared, and just before the concrete hardens, the surface shall be

- finished to a smooth and uniformly fine granular or sandy texture free of waves, irregularities, or tool marks. A scored surface shall be produced by brooming with a fiber-bristle brush in a direction perpendicular to that of the traffic. All slab edges, including those at formed joints, shall be finished carefully with an edger having a radius of 1/8 inch. Transverse joint shall be edged before brooming, and the brooming shall eliminate the flat surface left by the surface face of the edger. Corners and edges which have crumbled and areas which lack sufficient mortar for proper finishing shall be cleaned and filled solidly with a properly proportioned mortar mixture and then finished. All slab edges, including those at formed joints, shall be sealed with a rubberized asphalt sealant to control water damage to the subgrade and control of weed and grass growth in the edges and joints.
- E. Tolerances: Finished surfaces shall not vary more than 1/4 inch from the testing edge of a 10-foot straightedge. Permissible deficiency in section thickness will be up to 1/4 inch.
- A. Joints: Expansion, contraction and sawed joints shall be installed in accordance with Section 32 13 73 – Concrete Paving Joints and Sealants.
- F. CURING AND PROTECTION: Concrete shall be protected against loss of moisture and rapid temperature changes for at least 7 days from the beginning of the curing operation. Unhardened concrete shall be protected from rain and flowing water. All equipment needed for adequate curing and protection of the concrete shall be on hand and ready for use before actual concrete placement begins. Protection shall be provided as necessary to prevent cracking of the pavement due to temperature changes during the curing period.
- G. Protection: Completed concrete shall be protected from damage until accepted. The Contractor shall repair damaged concrete and clean concrete discolored during construction. Concrete that is damaged shall be removed and reconstructed for the entire length between regularly scheduled joints. Refinishing the damaged portion will not be acceptable. Removed damaged portions shall be disposed of as directed.
- H. FIELD QUALITY CONTROL: The Contractor shall perform the inspection and tests described and meet the specified requirements for inspection details and frequency of testing. Based upon the results of these inspections and tests, the Contractor shall take the action and submit reports as required below, and any additional tests to ensure that the requirements of these specifications are met.
- I. Strength Testing: The Contractor shall provide molded concrete specimens for strength tests. Samples of concrete placed each day shall be taken not less than once a day nor less than once for every 150 cubic yards of concrete. The samples for strength tests shall be taken in accordance with ASTM C 172. Cylinders for acceptance shall be molded in conformance with ASTM C 31 by an approved testing laboratory. Each strength test result shall be the average of two test cylinders from the same concrete sample tested at 28 days, unless otherwise specified or approved. At least one concrete cylinder should be made to determine an early 7-day strength so further construction can be conducted. Concrete specified on the basis of compressive strength will be considered satisfactory if the averages of all sets of three consecutive strength test results equal or exceed the specified strength, and no individual strength test result falls below the specified strength by more than 500 psi.

- J. Slump Test: One slump test shall be made on randomly selected batches of each class of concrete for every 150 cubic yards, or fraction thereof, of concrete placed during each shift. All slump tests are to be done on the middle third of the concrete within the concrete truck. Additional tests will be performed when excessive variation in the workability of the concrete is noted or when excessive crumbling or slumping is noticed along the edges of slip-formed concrete. Additional tests can be requested by the engineer or the testing laboratory at any time of the concrete job.
- K. Surface Evaluation: The finished surface of each category of the completed work shall be uniform in color and free of blemishes and form or tool marks. Exposed surfaces of the finished work will be inspected by the Engineer and any deficiencies in appearance will be identified. Areas which exhibit excessive cracking, discoloration, form marks, or tool marks or which are otherwise inconsistent with the overall appearances of the work shall be removed and replaced.

END OF SECTION

SECTION 321413

UNIT PAVERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Concrete paver units
- B. Bedding and joint sand.

1.03 REFERENCES

- A. American Society of Testing and Materials (ASTM):

- 1. C 33, Specification for Concrete Aggregates.
- 2. C 136, Method for Sieve Analysis for Fine and Coarse Aggregate.
- 3. C 140, Sampling and Testing Concrete Masonry Units.
- 4. C 144, Standard Specification for Aggregate for Masonry Mortar.
- 5. C 936, Specification for Solid Interlocking Concrete Paving Units.
- 6. C 979, Specification for Pigments for Integrally Colored Concrete.
- 7. D 698, Test Methods for Moisture Density Relations of Soil and Soil Aggregate Mixtures Using a 5.5-lb (2.49 kg) Rammer and 12 in. (305 mm) drop.
- 8. D 1557, Test Methods for Moisture Density Relations of Soil and Soil Aggregate Mixtures Using a 10-lb (4.54 kg) Rammer and 18 in. (457 mm) drop.

1.04 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in the manufacture of concrete interlocking pavers for a minimum of five (5) years.
- B. Installation shall be by a contractor and crew with at least five (5) years of experience in placing interlocking concrete pavers on projects of similar nature or dollar cost.
- C. Installation Contractor shall conform to all local, state/provincial licensing and bonding requirements.

1.05 SUBMITTALS

- A. Submit product drawings and data.
- B. Submit full size sample sets of concrete paving units to indicate color and shape selections. Color will be selected by SSP from manufacturer's available colors.
- C. Submit sealer tech specs (Techniseal 'Natural Look (iN)', matte finish, penetrating paver sealer, product code 60304120.)
- D. Submit sieve analysis for grading of bedding and joint sand.
- E. Indicate layout, pattern, and relationship of paving joints to fixtures per plans and details.
- F. Substitutions: Substitutions shall be submitted 7 days prior to bid opening for acceptance.

1.06 MOCK-UPS

- A. Install a 12 ft. x 12 ft. paver area as described in Article 3.02. This area will be used to determine surcharge of the bedding sand layer, joint sizes, lines, laying pattern(s), color(s), and texture of the job. This area shall be the standard from which the work will be judged. Consideration shall be given with regard to differences in age of materials from time of mock-up erection to time of actual product delivery.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver concrete pavers to the site in steel banded, plastic banded, or plastic wrapped cubes capable of transfer by fork lift or clamp lift. Unload pavers at job site in such a manner that no damage occurs to the product.
- B. Sand shall be covered with waterproof covering to prevent exposure to rainfall or removal by wind. The covering shall be secured in place.
- C. Coordinate delivery and paving schedule to minimize interference with normal use of buildings adjacent to paving.

1.08 MAINTENANCE/WARRANTY

- A. Maintenance Requirements: Maintain the work of this Section for one year after ‘substantial completion’ and until final written acceptance by Owner. Notify the owner in writing of ‘substantial completion’. Maintenance period begins after owner’s written acceptance of ‘substantial completion’.
- B. Maintenance Service: Perform the following maintenance operations during construction and throughout the 90 day maintenance period until final acceptance by Owner:
 - 1. Re-sand all joints and gaps in pavers as required or requested by owner. Use polymeric sand to fill all joints.
 - 2. Re-level pavers as required or requested by owner.
 - 3. Control/eradicate any weed or vegetative growth within paver areas.

PART 2 PRODUCTS

2.01 CONCRETE PAVERS

- A. Concrete pavers shall be supplied by:

Keystone Hardscapes/Pavestone
1900 Clovis Barker Road
San Marcos, TX 78666
512.558.7283
512.558.7289 (Fax)

- B. Pavers shall be Keystone Hardscapes - “Holland”

C. Color, and overall dimensions shall be:

Field:

1. Paver – 7.87” x 3.94” x 3.15” thickness (80mm)
2. Color light brown / tan mix
3. Pattern shall be 45 degree herringbone (provide mock up for review and approval)

Banding:

1. Paver – 7.87” x 3.94” x 3.15” thickness (80mm)
2. Color dark brown
3. Pattern shall be soldier course (as shown on plans)

Note: Paver Colors to be confirmed by Owner in writing prior to ordering.

D. Pavers shall meet the following requirements set forth in ASTM C 936, Standard Specification for Interlocking Concrete Paving Units:

1. Average compressive strength of 8,000 psi (55 MPa) with no individual unit under 7,200 psi (50 MPa).
2. Average absorption of 5% with no unit greater than 7% when tested in accordance with ASTM C 140.
3. Resistance to 50 freeze-thaw cycles when tested in accordance with ASTM C 67.

E. Pigment in concrete pavers shall conform to ASTM C 979.

F. Material shall be manufactured in individual layers on production pallets.

G. Materials shall be manufactured to produce a solid homogeneous matrix in the produced unit.

H. Seal all paver surfaces when thoroughly dry. Use Techniseal ‘Natural Look (iN)’, matte finish, penetrating paver sealer, product code 60304120.

2.02 VISUAL INSPECTION

A. All units shall be sound and free of defects that would interfere with the proper placing of unit or impair the strength or permanence of the construction.

2.03 SAMPLING AND TESTING

A. Manufacturer shall provide access to lots ready for delivery to the Owner or his authorized representative for testing in accordance with ASTM 936-82 for sampling of material prior to commencement of paver placement.

B. Manufacturer shall provide a minimum of three (3) years testing backup data showing manufactured products that meet and exceed ASTM 936-82 when tested in compliance with ASTM C-140.

C. Sampling shall be random with a minimum of nine (9) specimens per 20,000 sq. ft. per product shape and size with repeated samples taken every additional 20,000 sq. ft. or a fraction thereof.

D. Test units in accordance with ASTM for compressive strength, absorption and dimensional tolerance. A minimum of three (3) specimens per test required for an average value. Testing of full units is preferred.

2.04 REJECTION

- A. In the event the shipment fails to conform to the specified requirements, the manufacturer may sort it, and new test units shall be selected at random by the Owner from the retained lot and tested at the expense of the manufacturer. If the second set of test units fails to conform to the specified requirements, the entire lot shall be rejected.

2.05 EXPENSE OF TESTS

- A. The expense of inspection and testing shall be borne by the Owner.

2.06 BEDDING AND JOINT SAND

- A. Bedding and joint sand shall be clean, non-plastic, free from deleterious or foreign matter. The sand shall be natural or manufactured from crushed rock. Limestone screenings or stone dust shall not be used.
- B. Grading of sand samples for the bedding course and joints shall be done according to ASTM C 136. The bedding sand shall conform to the grading requirements of ASTM C 33 as shown in Table 1 below.

Table 1	
Grading Requirements for Bedding Sand	
<i>ASTM C 136</i>	
Sieve Size	Percent Passing
3/8 in. (9.5 mm)	100
No. 4 (4.75 mm)	95 to 100
No. 8 (2.36 mm)	85 to 100
No. 16 (1.18 mm)	50 to 85
No. 30 (600 µm)	25 to 60
No. 50 (300 µm)	10 to 30
No. 100 (150 µm)	2 to 10

Bedding sand may be used for joint sand for the initial filling of joints but must be supplemented with polymeric sand or gel to completely fill the joints. If joint sand other than bedding sand is used, the gradations shown in Table 2 are recommended. Joint sand should never be used for bedding sand.

- C. The joint sand shall conform to the grading requirements of ASTM C 144 as shown in Table 2 below:

Table 2	
Grading Requirements for Joint Sand	
<i>ASTM C 144 Natural Sand</i>	
Sieve Size	Percent Passing
No. 4 (4.75 mm)	100

No. 8 (2.36 mm)	95 to 100
No. 16 (1.18 mm)	70 to 100
No. 30 (600 µm)	40 to 75
No. 50 (300 µm)	10 to 35
No. 100 (150 µm)	2 to 15
No. 200 (75 µm)	0

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that subgrade preparation, compacted density and elevations conform to the specifications. Compaction of the soil subgrade to at least 95% Standard Proctor Density per ASTM D 698 is recommended. Stabilization of the subgrade and/or base material may be necessary with weak or saturated subgrade soils. Owner/SSP Design will inspect subgrade preparation, elevations, and conformance to specifications.
- B. Verify that aggregate base materials, thickness, compaction, surface tolerances, and elevations conform to the civil engineers grading plans and specifications.
- C. Verify location, type, installation and elevations of edge restraints around the perimeter area to be paved.
- D. Verify that base is dry, uniform, even, and ready to support sand, pavers, and imposed loads.
- E. Beginning of bedding sand and paver installation means acceptance of base and edge restraints.

3.02 INSTALLATION

- A. Refer to Engineer's plans for sub-base preparation, concrete work and final grades/elevations.
- B. Apply herbicide on any vegetative matter within paver areas.
- C. Apply pre-emergent herbicide to base course prior to installing leveling sand.
- D. Spread sand evenly over the base course and screed to a nominal 1 in. thickness, not exceeding 1-1/2 in. thickness. The screeded sand should not be disturbed. Place sufficient sand to stay ahead of the laid pavers. Do not use the bedding sand to fill depressions in the base surface.
- E. Ensure that pavers are free of foreign materials before installation.
- F. Lay the pavers in pattern as indicated on plans using specified paver types. Maintain straight pattern lines as indicated on plans or details. Paving banding pattern shall be installed as indicated on plans or details.
- G. Joints between pavers shall not exceed 3/16" in width. Miter cut pavers shall be used to minimize gaps and joints.
- H. Fill gaps at the edges of the paved area with cut pavers or edge units.
- I. Cut pavers to be cut/sawn using a masonry saw. Paver splitters shall not be used.
- J. Use a low amplitude, high frequency plate vibrator to vibrate the pavers into the sand. Use Table 3 below to select size of compaction equipment:

Table 3	
Paver Thickness	Minimum Centrifugal Compaction Force
60 mm	3000 lbs. (13 kN)
80 mm	500 lbs (22 kN)

- K. Vibrate the pavers, sweeping polymeric sand or gel into the joints and vibrating until they are fully compacted. This will require at least two or three passes with the vibrator. Do not vibrate within 3 ft. (1 m) of the unrestrained edges of the paving units.
- L. Install 'hidden' concrete edge restraints as shown on details using Min. 2500 PSI concrete with fibre-mesh reinforcement and rebar.
- M. All work to within 3 ft. (1 m) of the laying face must be left fully compacted with sand-filled joints at the completion of each day.
- N. Sweep off excess sand when the job is complete.
- O. The final surface elevations shall not deviate more than 3/8 in. (10 mm) under a 10 ft. (3 m) long straightedge.
- P. The surface elevation of pavers shall be 1/8 in. to 1/4 in. (3 to 6 mm) above adjacent drainage inlets, concrete collars or channels.
- I. Apply penetrating sealer when pavers are completely dry and clean. Matte finish, (Techniseal 'Natural Look (iN)', matte finish, penetrating paver sealer, product code 60304120).
- Q. The re-sanding of paver joints using polymeric sand shall be accomplished by contractor for a period of one (1) year after completion of work.

3.03 FIELD QUALITY CONTROL

- A. After removal of excess sand, check and adjust final elevations for conformance to the grading and drainage plans.
- B. Clean pavers and project site

END OF SECTION

**SECTION 328423
UNDERGROUND SPRINKLERS**

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. ASTM B32 - Standard Specification for Solder Metal; 2020.
- B. ASTM D2235 - Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings; 2022.
- C. ASTM D2241 - Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series); 2020.
- D. ASTM D2564 - Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems; 2020.
- E. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2020.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Comply with applicable code for piping and component requirements.
- B. Provide certificate of compliance from authority having jurisdiction indicating approval of products in system.

2.02 IRRIGATION SYSTEM

- A. Refer to Drawings.

2.03 PIPE MATERIALS

- A. Refer to drawings.

2.04 OUTLETS

- A. Refer to Drawings for Head, Nozzle, Bubbler, and Quick Coupler Specification

2.05 VALVES

- A. Refer to Drawings

2.06 CONTROLS

- A. Refer to Drawings.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify location of existing utilities.
- B. Verify that required utilities are available, in proper location, and ready for use.

3.02 TRENCHING

- A. Trench and backfill in accordance with Section 312316.13.
- B. Trench Size: Refer to Drawings
- C. Trench to accommodate grade changes and slope to drains.
- D. Maintain trenches free of debris, material, or obstructions that may damage pipe.

3.03 INSTALLATION

- A. Install pipe, valves, controls, and outlets in accordance with manufacturer's instructions.
- B. Connect to utilities.
- C. Set outlets and box covers at finish grade elevations.
- D. Provide for thermal movement of components in system.
- E. Use threaded nipples for risers to each outlet.

- F. After piping is installed, but before outlets are installed and backfilling commences, open valves and flush system with full head of water.
- G. Refer to Drawings.

3.04 SYSTEM STARTUP

- A. Prepare and start system in accordance with manufacturer's instructions.
- B. Adjust control system to achieve time cycles required.
- C. Adjust head types for full water coverage as directed.

3.05 CLOSEOUT ACTIVITIES

- A. Instruct Owner's personnel in operation and maintenance of system, including adjusting of sprinkler heads. Use operation and maintenance data as basis for demonstration.

END OF SECTION 328423

**SECTION 329119
LANDSCAPE GRADING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Topsoil placement.
- B. Finish grading.

1.02 REFERENCE STANDARDS

- A. ASTM D5268 - Standard Specification for Topsoil Used for Landscaping and Construction Purposes; 2022.

1.03 FIELD CONDITIONS

- A. Place topsoil during dry weather.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Topsoil: Comply with ASTM D5268.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify grading and intended elevations are as indicated on drawings.
- B. Verify absence of standing or ponding water.

3.02 PREPARATION

- A. Remove debris, roots, branches, stones, in excess of 1/2 inch in size.
- B. Scarify surface to depth of 3 inches.

3.03 TOPSOIL PLACEMENT

- A. Uniformly distribute and spread topsoil.
- B. Place topsoil in areas where seeding, sodding, and planting as indicated on drawings.
- C. Compacted Topsoil Thickness: Place as indicated on drawings.

3.04 FINISH GRADING

- A. Maintain profiles and contour of subgrade.
- B. Remove roots, weeds, rocks, and foreign material while spreading.
- C. Maintain uniform topsoil thickness.
- D. Lightly compact placed topsoil.

END OF SECTION 329119

SECTION 329219 SEEDING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Preparation of subsoil.
- B. Placing topsoil.
- C. Hydroseeding, mulching and fertilizer.

1.02 RELATED REQUIREMENTS

- A. Section 312200 - Grading: Topsoil material.
- B. Section 312200 - Grading: Preparation of subsoil and placement of topsoil in preparation for the work of this section.
- C. Section 312323 - Fill: Topsoil material.
- D. Section 320190 - Operation and Maintenance of Planting: Post-occupancy maintenance.

1.03 DEFINITIONS

- A. Weeds: Include Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Comply with regulatory agencies for fertilizer and herbicide composition.
- B. Provide certificate of compliance from authority having jurisdiction indicating approval of seed mixture.

2.02 SEED MIXTURE

- A. Seed Mixture: as indicated in drawings.

2.03 SOIL MATERIALS

- A. Topsoil: Excavated from site and free of weeds.

2.04 ACCESSORIES

- A. Fertilizer: Recommended for grass, slow release nitrogen, biological materials, and biostimulant materials; of proportion necessary to eliminate deficiencies of topsoil.
- B. Water: Clean, fresh and free of substances or matter that could inhibit vigorous growth of grass.

2.05 TESTS

- A. Analyze to ascertain percentage of nitrogen, phosphorus, potash, soluble salt content, organic matter content, and pH value.
- B. Submit minimum 10 oz sample of topsoil proposed. Forward sample to approved testing laboratory in sealed containers to prevent contamination.
- C. Testing is not required if recent tests are available for imported topsoil. Submit these test results to the testing laboratory for approval. Indicate, by test results, information necessary to determine suitability.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that prepared soil base is ready to receive the work of this Section.

3.02 PREPARATION

- A. Prepare subgrade in accordance with Section 312200.

- B. Place topsoil in accordance with Section 312200.

3.03 FERTILIZING

- A. Apply fertilizer in accordance with manufacturer's instructions.
- B. Apply after smooth raking of topsoil and prior to roller compaction.
- C. Do not apply fertilizer at same time or with same machine as will be used to apply seed.
- D. Mix thoroughly into upper 2 inches of topsoil.
- E. Lightly water to aid the dissipation of fertilizer.

3.04 HYDROSEEDING

- A. Apply seeded slurry with a hydraulic seeder at a rate of 4 lbs per 1000 sq ft evenly in two intersecting directions.
- B. Do not hydroseed area in excess of that which can be mulched on same day.
- C. Immediately following seeding, apply mulch to a thickness of 1/8 inches. Maintain clear of shrubs and trees.
- D. Apply water with a fine spray immediately after each area has been mulched. Saturate to 4 inches of soil.
- E. Following germination, immediately re-seed areas without germinated seeds that are larger than 4 by 4 inches.

3.05 PROTECTION

- A. Cover seeded slopes where grade is 4 inches per foot or greater with erosion fabric. Roll fabric onto slopes without stretching or pulling.
- B. Lay fabric smoothly on surface, bury top end of each section in 6 inch deep excavated topsoil trench. Provide 12 inch overlap of adjacent rolls. Backfill trench and rake smooth, level with adjacent soil.
- C. Secure outside edges and overlaps at 36 inch intervals with stakes.
- D. Lightly dress slopes with topsoil to ensure close contact between fabric and soil.
- E. At sides of ditches, lay fabric laps in direction of water flow. Lap ends and edges minimum 6 inches.

3.06 MAINTENANCE

- A. See Section 320190 - Operation and Maintenance of Planting for post-occupancy maintenance.

END OF SECTION 329219

SECTION 329223 SODDING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Preparation of subsoil.
- B. Placing topsoil.
- C. Fertilizing.
- D. Sod installation.

1.02 RELATED REQUIREMENTS

- A. Section 312200 - Grading: Preparation of subsoil and placement of topsoil in preparation for the work of this section.
- B. Section 312323 - Fill: Topsoil material.
- C. Section 320190 - Operation and Maintenance of Planting: Post-occupancy maintenance.

1.03 DEFINITIONS

- A. Weeds: Includes Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.

1.04 REFERENCE STANDARDS

- A. TPI (SPEC) - Guideline Specifications to Turfgrass Sodding; 2006.

1.05 SUBMITTALS

- A. See General Conditions Section within Contract Documents for submittal procedures.
- B. Certificate: Certify grass species and location of sod source.
- C. Certificate: Certify fertilizer and herbicide mixture approval by The City of Katy.
- D. Soil Samples
 - 1. Advanced Biological Test by Earthfort (Soil Food Web Certified Lab) - Corvallis, OR
 - 2. One of the Following Tests
 - a. TPSL® SOIL TEST + LOI + SOLVITA® by Texas Soil and Plant Lab - Edinburg, TX
 - b. Organic Media Appraisal Package with Recommendations Test by Perry Labs - Bowling Green, MO.
- E. Compost Product Data and 1 Gallon Sample

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver sod on pallets. Protect exposed roots from dehydration.
- B. Do not deliver more sod than can be laid within 24 hours.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Comply with regulatory agencies for fertilizer and herbicide composition.
- B. Provide certificate of compliance from authority having jurisdiction indicating approval of fertilizer and herbicide mixture.

2.02 MATERIALS

- A. Sod: TPI (SPEC), Certified Turfgrass Sod quality; cultivated grass sod; type indicated in plant schedule on Drawings; with strong fibrous root system, free of stones, burned or bare spots; containing no more than 5 weeds per 1000 sq ft. Minimum age of 18 months, with root development that will support its own weight without tearing, when suspended vertically by holding the upper two corners.
 - 1. Common Bermuda

2. Thickness: "Thick" sod, minimum 1 inch and maximum 1-3/8 inch topsoil base.
 3. Cut sod in area not exceeding 1 sq yd.
 4. Machine cut sod and load on pallets in accordance with TPI (SPEC) Guidelines.
- B. Topsoil: Type as specified in Section 312323.
- C. Water: Clean, fresh and free of substances or matter that could inhibit vigorous growth of grass.
- D. Compost: Leaf Mold Compost by Nature's Way (936) 321- 6990, OR Approved Equal.
- E. Sand: Sand: Clean, washed, granular, homogeneous in size. Bank sand not allowed

2.03 ACCESSORIES

- A. Edging: Powder Coated Steel.

PART 3 EXECUTION

3.01 PREPARATION

- A. Prepare subgrade in accordance with Section 312200.
- B. Place topsoil in accordance with Section 312200.

3.02 LAYING SOD

- A. Moisten prepared surface immediately prior to laying sod.
- B. Lay sod immediately after delivery to site to prevent deterioration.
- C. Lay sod smooth and tight with no open joints visible, and no overlapping; stagger end joints 12 inches minimum. Do not stretch or overlap sod pieces.
- D. Where new sod adjoins existing grass areas, align top surfaces.
- E. Where sod is placed adjacent to hard surfaces, such as curbs, pavements, etc., place top elevation of sod 1/2 inch below top of hard surface.
- F. Water sodded areas immediately after installation. Saturate sod to 4 inches of soil.
- G. After sod and soil have dried, roll sodded areas to ensure good bond between sod and soil and to remove minor depressions and irregularities. Roll sodded areas with roller not exceeding 300 lbs.

3.03 COMPLETION

- A. Turf Areas considered substantially complete with full, thick coverage of the area specified. 95% coverage of all turf areas, ready for use. No more than 5% of the turf area shall be bare soil or covered with broadleaf weeds. No bare spots greater than 6 inch diameter.
- B. Two mowings of turf, no closer than ten calendar days apart shall be completed prior to substantial completion walkthrough.

3.04 MAINTENANCE

- A. See Section 320190 - Operation and Maintenance of Planting for post-occupancy maintenance.

END OF SECTION 329223

SECTION 329300 PLANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Preparation of subsoil.
- B. Topsoil bedding.
- C. New trees, plants, and ground cover.
- D. Relocated trees, plants, and ground cover.
- E. Mulch and Fertilizer.
- F. Maintenance.
- G. Tree Pruning.

1.02 RELATED REQUIREMENTS

- A. Section 312200 - Grading: Topsoil material.
- B. Section 312323 - Fill: Topsoil material.
- C. Section 320190 - Operation and Maintenance of Planting: Post-occupancy maintenance.

1.03 DEFINITIONS

- A. Weeds: Any plant life not specified or scheduled.
- B. Plants: Living trees, plants, and ground cover specified in this Section , and described in ANSI Z60.1.
- C. Backfill: The earth used to replace or the act of replacing earth in an excavation.
- D. Prepared Backfill Mix: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- E. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.
- F. Pests: Living organisms that occur where they are not desired, or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.
- G. Topsoil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.
- H. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.
- I. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.
- J. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

1.04 REFERENCE STANDARDS

- A. ANSI/AHIA Z60.1 - American National Standard for Nursery Stock; 2014.
- B. ANSI A300 Part 1 - American National Standard for Tree Care Operations - Tree, Shrub, and Other Woody Plant Management - Standard Practices (Pruning); 2017.

1.05 SUBMITTALS

- A. See General Conditions Section within Contract Documents for submittal procedures.
- B. Photographic Imagery of all Plant material with scale device.

- C. Compost Data Sheet and Product Sample (1 Gallon Bag)
- D. Fertilizer Data Sheets
- E. Mulch Data Sheet and Product Sample (1 Gallon Bag)
- F. Maintenance Data: Include cutting and trimming method ; types, application frequency, and recommended coverage of fertilizer .
- G. Maintenance Contract.

1.06 QUALITY ASSURANCE

- A. Nursery Qualifications: Company specializing in growing and cultivating the plants with three years documented experience.
- B. Installer Qualifications: Company specializing in installing and planting the plants with five years experience.
- C. Tree Pruner Qualifications: Company specializing in pruning trees with proof of Arborist Certification.
- D. Tree Pruning: Comply with ANSI A300 Part 1.
- E. Maintenance Services: Performed by installer.
- F. Non-native, Invasive Plant Species: Do not introduce, grow, or cultivate plant species that are non-native to the ecosystem of the project site, and whose introduction causes or is likely to cause economic or environmental harm or harm to human health.
 - 1. Comply with laws regulating non-native and invasive plant species in the State in which the Project is located.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.
- B. Protect and maintain plant life until planted.
- C. Deliver plant life materials immediately prior to placement. Keep plants moist.

1.08 FIELD CONDITIONS

- A. Do not install plant life when ambient temperatures may drop below 35 degrees F or rise above 90 degrees F.
- B. Do not install plant life when wind velocity exceeds 30 mph.

1.09 WARRANTY

- A. Provide one year warranty.
- B. Warranty: Include coverage for one continuous growing season; replace dead or unhealthy plants.
- C. Replacements: Plants of same size and species as specified, planted in the next growing season, with a new warranty commencing on date of replacement.

1.10 MAINTENANCE (SEE END OF SECTION)

- A. Provide a separate maintenance contract for specified maintenance service.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Comply with regulatory agencies for fertilizer and herbicide composition.
- B. Plant Materials: Certified by federal department of agriculture; free of disease or hazardous insects.

2.02 PLANTS

- A. Plants: Species and size identified in plant schedule, grown in climatic conditions similar to those in locality of the work.

- B. Plants shall be sound, healthy and vigorous, well branched and densely foliated when in leaf. They shall be free of disease, insect pests, eggs, or larvae, and shall have healthy, well developed root systems. They shall be free from physical damage or adverse conditions that would prevent thriving growth.
- C. Container grown native grasses and aquatics (non-woody plants) shall have well-established rootballs. Rootballs of non-woody plants must not be separated, broken up, or otherwise damage prior to or during installation.
- D. Plants shall be true to species and variety and shall conform to measurements specified except that plants larger than specified may be used if approved by Landscape Architect. Use of such plants shall not increase Contract price. If larger plants are approved, the ball of earth or container size shall be increased as specified under "Applicable Standards" and subject to the approval of the Landscape Architect.
- E. Plants shall be true to species and variety and shall conform to measurements specified except that plants larger than specified may be used if approved by Landscape Architect. Use of such plants shall not increase Contract price. If larger plants are approved, the ball of earth or container size shall be increased as specified under "Applicable Standards" and subject to the approval of the Landscape Architect.
- F. Container stock, when specified, shall have grown in the containers in which delivered for at least six (6) months, but not over two (2) years. Samples must prove no rootbound conditions exist. No container plants that have cracked or broken balls of earth when taken from container shall be planted except upon special approval by Landscape Architect. Container stock shall not be pruned before delivery. Field grown plants recently transplanted into containers will not be accepted.
- G. Trees shall not have girdling or circling roots. Clip girdling roots prior to install or remove from the project. Circling roots (container grown trees) must be clipped where beginning the circling in the container.

2.03 SOIL MATERIALS

- A. Topsoil: Type as specified in Section 312323.

2.04 SOIL AMENDMENT MATERIALS

- A. Fertilizer: Containing fifty percent of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil, as indicated in analysis.
- B. Fertilizers
 - 1. Microlife 8-4-6 Organic Fertilizer by San Jacinto Environmental Supply (713) 957-0909
 - 2. MicroGro Bio-Inoculant: Microlife by San Jacinto Environmental Supply (713) 957-0909
 - 3. Microlife Humates Plus 0-0-4 Organic Fertilizer by San Jacinto Environmental Supply (713) 957-0909
 - 4. JRM Tree Transplant Additive by San Jacinto Environmental Supply (713) 957-0909
 - 5. Microlife Super Seaweed Root Stimulator by San Jacinto Environmental Supply (713) 957-0909
 - 6. Re-Mineralizer (60:20:20 ratio green sand / basalt sand / granite sand) by Nature's Way Resources - Conroe, TX (936) 273-1200
 - 7. Microlife Bio-Inoculant Soluble Powder by San Jacinto Environmental Supply (713) 957-0909
- C. Compost: Fungal Compost by Nature's Way Resources - Conroe, TX (936) 273-1200
- D. Sand: Sharp, Washed, Sterilized, Free of Weed Seeds. Local Source
- E. Water: Clean, fresh, and free of substances or matter that could inhibit vigorous growth of plants.

2.05 MULCH MATERIALS

- A. Use one source throughout project.
- B. Double-Ground Native Hardwood by Nature's Way Resources - Conroe, TX (936) 273-1200

- C. Native Hardwood by The Ground Up - Richmond, TX (281) 829-9595
- D. Native Pine Straw Mulch. Local Source, Free of weeds and weed seeds.

2.06 ACCESSORIES

- A. Wrapping Materials: Burlap.
- B. Stakes: T-Posts, Straight, 6' min. length
- C. Staking Wires: Non-corrosive, of sufficient strength to withstand wind pressure and resulting movement of plant life.
- D. Plant Protectors: Rubber sleeves over cable to protect plant stems, trunks, and branches.
- E. Root Barrier: Deep Root root barrier by Deeproot OR Approved Equal. Local Source: San Jacinto Environmental Supply – Houston, TX (713) 957-0909.
- F. Steel Edging: 3/16" x 4" (Minimum Sizes) Painted steel. Local Source: Refer to drawings for color/finish and dimensions, if larger.
- G. Weed Fabric: Pro-5 Weed Barrier by San Jacinto Environmental Supply – Houston, TX (713)957-0909
- H. Drainage Gravel: 3/8" to 5/8" washed pea gravel.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that prepared subsoil and planters are ready to receive work.
- B. Saturate soil with water to test drainage.
- C. Verify that required underground utilities are available, in proper location, and ready for use.

3.02 LAYOUT OF PLANTING BEDS AND TREE LOCATIONS

- A. Layout and Staking: Lay out plants at locations shown on Drawings. Use color-coded wire flags for each species of plant material. Stake each tree, vine and major shrub. Outline shrub and groundcover beds with spray paint.
- B. Locations of plants will be observed in the field by the Landscape Architect and will be adjusted to exact position before planting begins. Right is reserved to refuse review at this time if, in Landscape Architect's opinion, a sufficient quantity of plants is not available.

3.03 PREPARATION OF SUBSOIL

- A. Prepare subsoil to eliminate uneven areas. Maintain profiles and contours. Make changes in grade gradual. Blend slopes into level areas.
- B. Remove foreign materials, weeds and undesirable plants and their roots. Remove contaminated subsoil.
- C. Test drainage of plant beds and pits by filling with water twice in succession. Conditions permitting the retention of water in planting beds for more than twenty-four (24) hours or percolation of less than one (1") inch per hour shall be brought to the attention of the Owner and Landscape Architect.
- D. Notify the Landscape Architect in writing of all soil or drainage conditions Contractor considers detrimental to growth of plant material.
- E. Obstructions: If rock, underground construction work, tree roots or other obstructions are encountered in the excavation of plant pits, alternate locations may be used as directed. Where locations cannot be changed, submit for acceptance a written proposal and cost estimate for cost required to remove the obstructions to a depth of not less than six (6") inches below the required pit depth. Proceed with work after acceptance

3.04 PLANT BED AND TREE PIT PREPARATION

- A. Excavation: Excavate plant pit to the required depth such that after completion of all steps, the top of root ball will be at a maximum of 1" above finished grade and no less than flush with finish grade after settlement.

1. Continuous Planting Beds
 - a. 4" Pots and 1 gallon shrubs: Excavate 4" below finish grade; till 4" of existing soil, backfill with backfill mix and mix thoroughly to 8" depth.
 - b. Five gallon shrubs: Excavate 7" below finish grade; till 7" of existing soil, backfill with backfill mix and mix thoroughly to 14" depth
2. Tree and Shrub Pit Dimensions
 - a. Depth: 1 times the rootball depth
 - b. Width: 2 times the size of the rootball
- B. Plant Pit Backfill Mix: Mix excavated soil, organic matter and amendments according to Backfill Mix Below. Excess material to be used for fine grading or disposed of off-site at depending on site grade conditions. Mix all materials (except for fertilizer) thoroughly once through, then add fertilizer and mix once more.
 1. Imported Topsoil 55% (by volume)
 2. Sharp Washed Sand 15% (by volume)
 3. Compost 30% (by volume)
 4. Re-mineralizer 5 lbs/CY (Additional to Toposil, Sand, Compost)
 5. Microlife 8-4-6 Fertilizer 5 lbs/CY
 6. Microlife Humates Plus 0-0-4 Fertilizer - 3 lbs/CY
 7. JRM Tree Transplant additive - 1 pack per caliper inch of tree (Trees only)
- C. Scarify the walls and bottom of all plant pits immediately prior to the placement of plant and backfill mix. The Contractor shall remove all glazing caused by an auger or mechanical hole digger.
- D. Install PVC inspection pipe vertically at edge of pit for specimen trees (over 6" caliper).

3.05 PLACING TOPSOIL

- A. Spread topsoil to a minimum depth of 4 inches over area to be planted. Rake smooth.
- B. Place topsoil during dry weather and on dry unfrozen subgrade.
- C. Remove vegetable matter and foreign non-organic material from topsoil while spreading.
- D. Grade topsoil to eliminate rough, low or soft areas, and to ensure positive drainage.
- E. Install topsoil into pits and beds intended for plant root balls, to a minimum thickness of 6 inches.

3.06 PLANTING

- A. Place plants for best appearance.
- B. Container stock shall have containers removed carefully after containers have been cut on two sides with approved cutter. Do not use spade to cut containers. Do not lift or handle container plants by tops, stems, or trunks at any time. Prune away girdled roots and tease root hair masses.
- C. For boxed material, break vertical bands and remove top and bottom of container. Carefully lower plant into pit with approved method and adjust elevation. Cut horizontal bands and remove sides. Prune away girdled roots and tease root hair masses.
- D. Place B&B plants carefully in the prepared planting pit. Do not disturb root ball or untie twine or roping until backfill settlement is complete, and tree is staked, if applicable.
- E. Set plants vertical.
- F. Carefully fill pit and compact by watering in and tamping to each eight (8") inches of backfill to support root ball.
- G. Remove non-biodegradable root containers.
- H. Set plants in pits or beds, partly filled with prepared plant mix, at a minimum depth of 6 inches under each plant. Remove burlap, ropes, and wires, from the root ball.
- I. Place bare root plant materials so roots lie in a natural position. Backfill soil mixture in 6 inch layers. Maintain plant life in vertical position.

- J. Adjustment: Adjust plants so that after full settlement has occurred, the natural grade at the base of the plants flush to a maximum of two (2") inches above the adjacent finish grade.
- K. Smooth planted areas to conform to specified grades after full settlement has occurred. Contractor shall bear final responsibility for proper surface drainage of planted areas. Any discrepancy in the drawings or specifications, obstructions on the site, or prior work done by another party which Contractor feels precludes establishing proper drainage, shall be brought to the attention of the Landscape Architect in writing.
- L. Tree Watering Basin: Form circular ring of earth to create a three (3") inch high berm centered around tree
- M. Saturate soil with water when the pit or bed is half full of topsoil and again when full.
- N. Water all plants immediately again after planting. For any trees with container size over 30 gallons, as well as any sized ball and burlap or tree-spade moved tree, or shrub 7 gallon or larger "water in" with Microlife Super Seaweed Liquid per manufacturer's recommendation (soil drench).

3.07 MULCHING

- A. Install a three 3" inch deep layer of mulch over all shrub areas including tree and shrub watering basins. 6" Depth if Pine Straw Mulch is specified.
- B. Install a 3" deep circle of mulch to dripline in all trees planted in lawns. Ensure mulch does not contact trunk of tree – leave 2" gap around trunk.'
- C. Ensure crown of root flare is exposed.

3.08 INSTALLATION OF ACCESSORIES

- A. Place decorative cover and membrane, where indicated on drawings.
- B. Steel Edging:
 - 1. Install headers prior to installation of adjacent sprinkler irrigation system.
 - 2. Headers: Install headers true to line and grade as shown on the Drawings. Align header edges and set flush with adjacent paving.
 - 3. Stakes shall be a minimum of twelve (12") inches long and longer as required for solid anchorage. Double stake all joints and corners. Anchor with steel stakes spaced not more than three (3") feet o/c or as often as necessary to have smooth radius or straight tangent. Drive stake to one (1") inch below top of edging.

3.09 PLANT SUPPORT

- A. Above Ground Bracing: Brace plants vertically with plant protector wrapped guy wires and stakes to the following:
 - 1. Tree Caliper: 1-4 inches; Tree Support Method: 3 guy wires with T-Posts.
 - 2. Tree Caliper: Over 4 inches; Tree Support Method: 4 guy wires with T-Posts
- B. Subsurface Anchors: Minimum 3 anchors. Refer to manufacturer's recommendations for tree size/anchor requirements.

3.10 TREE PRUNING

- A. Prune trees as recommended in ANSI A300 Part 1.
- B. Prune newly planted trees as required to remove dead, broken, and split branches.
- C. Use only sharp, clean tools

3.11 FIELD QUALITY CONTROL

- A. Plants will be rejected if a ball of earth surrounding roots has been disturbed or damaged prior to or during planting.
- B. Keep all work areas neat, clean, and orderly at all times.
- C. Remove trash at the end of every work day.
- D. Clean up and remove all deleterious materials and debris from the entire work area prior to Final Acceptance.

3.12 MAINTENANCE

- A. See Section 320190 - Operation and Maintenance of Planting for post-occupancy maintenance.
- B. Maintain plant life immediately after placement and until plants are well established and exhibit a vigorous growing condition. Continue maintenance until termination of warranty period.
- C. Fill in as necessary soil subsidence that may occur because of settling or other processes.

END OF SECTION 329300

SECTION 330516

CONCRETE FOR UTILITY CONSTRUCTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Cast-in-place concrete work for utility construction or rehabilitation, such as slabs on grade, small vaults, site-cast bases for precast units, and in-place liners for manhole rehabilitation.

1.2 UNIT PRICES

- A. Unit Prices.
 - 1. No payment will be made for concrete for utility construction under this Section. Include cost in applicable utility structures and fittings.

1.3 REFERENCES

- A. ACI 117 - Standard Tolerances for Concrete Construction and Materials.
- B. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
- C. ACI 302.1R - Guide for Concrete Floor and Slab Construction.
- D. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete.
- E. ACI 308 - Standard Practice for Curing Concrete.
- F. ACI 309R - Guide for Consolidation of Concrete.
- G. ACI 311 - Batch Plant Inspection and Field Testing of Ready Mixed Concrete.
- H. ACI 315 - Manual of Standard Practice for Detailing Reinforced Concrete Structures.
- I. ACI 318 - Building Code Requirements for Reinforced Concrete.
- J. ACI 544 - Guide for Specifying, Mixing, Placing, and Finishing Steel Fiber Reinforced Concrete.
- K. ASTM A 82 - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
- L. ASTM A 185 - Standard Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
- M. ASTM A 615 - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
- N. ASTM A 767 - Standard Specifications for Zinc-coated (Galvanized) Bars for Concrete Reinforcement.
- O. ASTM A 775 - Standard Specification for Epoxy-Coated Reinforcing Steel Bars.
- P. ASTM A 820 - Steel Fibers for Fiber Reinforced Concrete.
- Q. ASTM A 884 - Specification for Epoxy-coated Steel Wire and Welded Wire Fabric for Reinforcement.
- R. ASTM C 31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
- S. ASTM C 33 - Standard Specification for Concrete Aggregates.
- T. ASTM C 39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.

- U. ASTM C 42 - Standard Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
- V. ASTM C 94 - Standard Specification for Ready-Mixed Concrete.
- W. ASTM C 138 - Standard Test Method for Unit Weight Yield and Air Content (Gravimetric) of Concrete.
- X. ASTM C 143 - Standard Test Method for Slump of Hydraulic Cement Concrete.
- Y. ASTM C 150 - Standard Specification for Portland Cement.
- Z. ASTM C 172 - Standard Practice for Sampling Freshly Mixed Concrete.
- AA. ASTM C 173 - Standard Test Method for Air Content of Freshly Mixed Concrete by Volumetric Method.
- BB. ASTM C 231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
- CC. ASTM C 260 - Standard Specification for Air-Entraining Admixtures for Concrete.
- DD. ASTM C 309 - Standard Specifications for Liquid Membrane-Forming Compounds for Curing Concrete.
- EE. ASTM C 494 - Standard Specification for Chemical Admixtures for Concrete.
- FF. ASTM C 595 - Standard Specification for Blended Hydraulic Cements.
- GG. ASTM C 685 - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing.
- HH. ASTM C 1017 - Chemical Admixtures for Use in Producing Flowing Concrete.
- I. ASTM C 1064 - Standard Test Method for Temperature of Freshly Mixed Portland Cement Concrete.
- JJ. ASTM C 1077 - Standard Practice for Laboratory Testing of Concrete and Concrete Aggregate for Use in Construction and Criteria for Laboratory Evaluation.
- KK. ASTM D 638 - Test Method for Tensile Properties of Plastics.
- LL. ASTM D 746 - Test Method for Brittleness Temperature of Plastics and Elastomers by Impact.
- MM. ASTM D 747 - Test Method for Apparent Bending Modulus of Plastics by Means of a Cantilever Beam.
- NN. CRSI MSP-1 - Manual of Standard Practice.
- OO. CRSI - Placing Reinforcing Bars.
- PP. Federal Specification SS-S-210A - Sealing Compound, Preformed Plastic, for Expansion Joints and Pipe Joints
- QQ. NRMCA - Concrete Plant Standards.

1.4 SUBMITTALS

- A. Conform to Section 01 33 00 - Submittal Procedures.
- B. Submit proposed mix design and test data for each type and strength of concrete in the Work.
- C. Submit laboratory reports prepared by an independent testing laboratory stating that materials used comply with requirements of this Section.
- D. Submit manufacturer's mill certificates for reinforcing steel. Provide specimens for testing when required by the Engineer.

- E. Submit certification from concrete supplier that materials and equipment used to produce and deliver concrete comply with this Specification.
- F. When required on Drawings, submit shop drawings showing reinforcement type, quantity, size, length, location, spacing, bending, splicing, support, fabrication details, and other pertinent information.
- G. For waterstops, submit product information sufficient to indicate compliance with this Section, including manufacturer's descriptive literature and specifications.

1.5 HANDLING AND STORAGE

- A. Cement: Store cement off the ground in a well-ventilated, weatherproof building.
- B. Aggregate: Prevent mixture of foreign materials with aggregate and preserve gradation of aggregate.
- C. Reinforcing Steel: Store reinforcing steel to protect it from mechanical injury and formation of rust. Protect epoxy-coated steel from damage to the coating.

PART 2 - PRODUCTS

2.1 CONCRETE MATERIALS

- A. Cementitious Material:
 - 1. Portland Cement: ASTM C 150, Type II, unless the use of Type III is authorized by the Engineer; or ASTM C 595, Type IP. For concrete in contact with sewage use Type II cement.
 - 2. When aggregates are potentially reactive with alkalis in cement, use cement not exceeding 0.6 percent alkali content in the form of $\text{Na}_2\text{O} + 0.658\text{K}_2\text{O}$.
- B. Water: Clean, free from harmful amounts of oils, acids, alkalis, or other deleterious substances, and meeting requirements of ASTM C 94.
- C. Aggregate:
 - 1. Coarse Aggregate: ASTM C 33. Unless otherwise indicated, use the following ASTM standard sizes: No. 357 or No. 467; No. 57 or No. 67, No. 7. Maximum size: Not larger than 1/5 of the narrowest dimension between sides of forms, nor larger than 3/4 of minimum clear spacing between reinforcing bars.
 - 2. Fine Aggregate: ASTM C 33.
 - 3. Determine the potential reactivity of fine and coarse aggregate in accordance with the Appendix to ASTM C 33.

D. Air Entraining Admixtures: ASTM C 260.

E. Chemical Admixtures:

1. Water Reducers: ASTM C 494, Type A.
2. Water Reducing Retarders: ASTM 494, Type D.
3. High Range Water Reducers (Superplasticizers): ASTM C 494, Types F and G.

F. Prohibited Admixtures: Admixtures containing calcium chloride, thiocyanate, or materials that contribute free chloride ions in excess of 0.1 percent by weight of cement.

G. Reinforcing Steel:

1. Use new billet steel bars conforming to ASTM A 615, ASTM A 767, or ASTM A 775, grade 40 or grade 60, as shown on Drawings. Use deformed bars except where smooth bars are specified. When placed in work, keep steel free of dirt, scale, loose or flaky rust, paint, oil or other harmful materials.
2. Where shown, use welded wire fabric with wire conforming to ASTM A 185 or ASTM A 884. Supply the gauge and spacing shown, with longitudinal and transverse wires electrically welded together at points of intersection with welds strong enough not to be broken during handling or placing.
3. Wire: ASTM A 82. Use 16-1/2 gauge minimum for tie wire, unless otherwise indicated.

H. Fiber:

1. Fibrillated Polypropylene Fiber:
 - a. Addition Rate: 1.5 pounds of fiber per cubic yard of concrete.
 - b. Physical Properties:
 - (1) Material: Polypropylene.
 - (2) Length: 1/2 inch or graded
 - (3) Specific Gravity: 0.91.
 - c. Acceptable Manufacturer: W. R. Grace Company, Fibermesh, or approved equal.
2. Steel Fiber: Comply with applicable provisions of ACI 544 and ASTM A 820.
 - a. Ratio: 50 to 200 pounds of fiber per cubic yard of concrete.
 - b. Physical Properties

- (1) Material: Steel.
- (2) Aspect Ratio (for fiber lengths of 0.5 to 2.5-inch, length divided by diameter or equivalent diameter): 30:1 to 100:1.
- (3) Specific Gravity: 7.8.
- (4) Tensile Strength: 40-400 ksi.
- (5) Young's Modulus: 29,000 ksi.
- (6) Minimum Average Tensile Strength: 50,000 psi.
- (7) Bending Requirements: Withstand bending around 0.125-inch diameter mandrel to an angle of 90 degrees, at temperatures not less than 60 degrees F, without breaking.

- I. Curing Compounds: Type 2 white-pigmented liquid membrane-forming compounds conforming to ASTM C 309.

2.2 FORMWORK MATERIALS

- A. Lumber and Plywood: Seasoned and of good quality, free from loose or unsound knots, knot holes, twists, shakes, decay and other imperfections which would affect strength or impair the finished surface of concrete. Use S4S lumber for facing or sheathing. Forms for bottoms of caps: At least 2-inch (nominal) lumber, or 3/4-inch form plywood backed adequately to prevent misalignment. For general use, provide lumber of 1-inch nominal thickness or form plywood of approved thickness.
- B. Formwork for Exposed Concrete Indicated to Receive Rubbed Finish: Form or form-lining surfaces free of irregularities; plywood of 1/4-inch minimum thickness, preferably oiled at the mill.
- C. Chamfer Strips and Similar Moldings: Redwood, cypress, or pine that will not split when nailed and which can be maintained to true line. Use mill-cut molding dressed on all faces.
- D. Form Ties: Metal or fiberglass of approved type with tie holes not larger than 7/8 inch in diameter. Do not use wire ties or snap ties.
- E. Metal Forms: Clean and in good condition, free from dents and rust, grease, or other foreign materials that tend to disfigure or discolor concrete in a gauge and condition capable of supporting concrete and construction loads without significant distortion. Countersink bolt and rivet heads on facing sides. Use only metal forms which present a smooth surface, and which line up properly.

2.3 PRODUCTION METHODS

- A. Use either ready-mixed concrete conforming to requirements of ASTM C 94, or concrete produced by volumetric batching and continuous mixing in accordance with ASTM C 685.

2.4 MEASUREMENT OF MATERIALS

- A. Measure dry materials by weight, except volumetric proportioning may be used when concrete is batched and mixed in accordance with ASTM C 685.
- B. Measure water and liquid admixtures by volume.

2.5 DESIGN MIX

- A. Use design mixes prepared by a certified testing laboratory in accordance with ASTM C 1077 and conforming to requirements of this section.
- B. Proportion concrete materials based on ACI 211.1 to comply with durability and strength requirements of ACI 318, Chapters 4 and 5, and this specification. Prepare mix design of Class A concrete so minimum cementitious content is 564 pounds per cubic yard. Submit concrete mix designs to the Engineer for review.
- C. Proportioning on the basis of field experience or trial mixtures in accordance with requirements at Section 5.3 of ACI 318 may be used, if approved by the Engineer.
- D. Classification:

Class	Type	Minimum Compressive Strength (lbs/sq. in.)		Maximum W/C Ratio	Air Content (Percent)	Consistency range in slump (inches)
		7-day	28-day			
A	Structural	3200	4000	0.45	4+ 1	2 to 4*
B	Pipe Block Fill, Thrust Block	----	2500	----	4+ 1	5 to 7
*When ASTM C 494, Type F or Type G admixture is used to increase workability, this range may be 6 to 9.						

- E. Add steel or polypropylene fibers only when called for on the Drawings or in another section of these Specifications.
- F. Determine air content in accordance with ASTM C 138, ASTM C 173 or ASTM C 231.
- G. Use of Concrete Classes: Use classes of concrete as indicated on the Drawings and other Specifications. Use Class B for unreinforced concrete used for plugging pipes, seal slabs, thrust blocks, trench dams, and concrete fill unless indicated otherwise. Use Class A for all other applications.

2.6 PVC WATERSTOPS

- A. Extrude from virgin polyvinyl chloride elastomer. Use no reclaimed or scrap material. Submit waterstop manufacturer's current test reports and manufacturer's written certification that the material furnished meets or exceeds Corps of Engineers Specification CRD-C572 and other specified requirements.
- B. Flat Strip and Center-Bulb Waterstops:
 - 1. Thickness: not less than 3/8 inch
 - 2. Acceptable Manufacturers:
 - a. Kirkhill Rubber Co., Brea, California
 - b. Water Seals, Inc., Chicago, Illinois
 - c. Progress Unlimited, Inc., New York, New York
 - d. Greenstreak Plastic Products Co., St. Louis, Missouri
 - e. Approved equal.

2.7 RESILIENT WATERSTOP

- A. Resilient Waterstop: Where shown on the Drawings; either a bentonite- or adhesive-type material.
- B. Bentonite Waterstop:
 - 1. Material: 75 percent bentonite, mixed with butyl rubber-hydrocarbon containing less than 1.0 percent volatile matter, and free of asbestos fibers or asphaltic.
 - 2. Manufacturer's rated temperature ranges: For application, 5 to 125 degrees F; in service, -40 to 212 degrees F.
 - 3. Cross-sectional dimensions, unexpanded waterstop: 1 inch by 3/4 inch.
 - 4. Provide with adhesive backing capable of producing excellent adhesion to concrete surfaces.
- C. Adhesive Waterstop:
 - 1. Preformed plastic adhesive waterstop at least 2 inches in diameter.
 - 2. Meets or exceeds requirements of Federal Specification SS-S-210A.
 - 3. Supplied wrapped completely by a 2-part protective paper.
 - 4. Submit independent laboratory tests verifying that the material seals joints in concrete against leakage when subjected to a minimum of 30 psi water pressure for at least 72 hours.

5. Provide primer, to be used on hardened concrete surfaces, from the same manufacturer who supplies the waterstop material.
6. Acceptable Manufacturer: Synko-Flex Preformed Plastic Adhesive Waterstop, Synko-Flex Products, Inc.; or approved equal.

PART 3 - EXECUTION

3.1 FORMS AND SHORING

- A. Provide mortar-tight forms sufficient in strength to prevent bulging between supports. Set and maintain forms to lines designated such that finished dimensions of structures are within the tolerances specified in ACI 117. Construct forms to permit removal without damage to concrete. Forms may be given slight draft to permit ease of removal. Provide adequate cleanout openings. Before placing concrete, remove extraneous matter from within forms.
- B. Install rigid shoring having no excessive settlement or deformation. Use sound timber in shoring centering. Shim to adjust and tighten shoring with hardwood timber wedges.
- C. Design Loads for Horizontal Surfaces of Forms and Shoring: Minimum fluid pressure, 175 pounds per cubic foot; live load, 50 pounds per square foot. Maximum unit stresses: 125 percent of allowable stresses used for form materials and for design of support structures.
- D. Back formwork with a sufficient number of studs and wales to prevent deflection.
- E. Re-oil or lacquer the liner on the job before using. Facing may be constructed of 3/4-inch plywood made with waterproof adhesive backed by adequate studs and wales. In such cases, form lining will not be required.
- F. Unless otherwise indicated, form outside corners and edges with triangular 3/4-inch chamfer strips (measured on sides).
- G. Remove metal form ties to depth of at least 3/4 inch from surface of concrete. Do not burn off ties. Do not use pipe spreaders. Remove spreaders which are separate from forms as concrete is being placed.
- H. Treat facing of forms with approved form coating before concrete is placed. When directed by Engineer, treat both sides of face forms with coating. Apply coating before reinforcement is placed. Immediately before the concrete is placed, wet surface of forms which will come in contact with concrete.

3.2 PLACING REINFORCEMENT

- A. Place reinforcing steel accurately in accordance with approved Drawings. Secure steel adequately in position in forms to prevent misalignment. Maintain reinforcing steel in place using approved concrete and hot-dip galvanized metal chairs and spacers. Place reinforcing

steel in accordance with CRSI Publication "Placing Reinforcing Bars." Request inspection of reinforcing steel by the Engineer and obtain acceptance before concrete is placed.

- B. Minimum spacing center-to-center of parallel bars: 2-1/2 times nominal bar diameter. Minimum cover measured from surface of concrete to face of reinforcing bar unless shown otherwise on the Drawings: 3 inches for surfaces cast against soil or subgrade, 2 inches for other surfaces.
- C. Detail bars in accordance with ACI 315. Fabricate reinforcing steel in accordance with CRSI Publication MSP-1, "Manual of Standard Practice." Bend reinforcing steel to required shape while steel is cold. Excessive irregularities in bending will be cause for rejection.
- D. Do not splice bars without written approval of the Engineer. Approved bar bending schedules or placing drawings constitute written approval. Splice and development length of bars shall conform to ACI 318, Chapters 7 and 12, and as shown on Drawings. Stagger splices or locate at points of low tensile stress.

3.3 EMBEDDED ITEMS

- A. Install conduit and piping as shown on Drawings. Accurately locate and securely fasten conduit, piping, and other embedded items in forms.
- B. Install waterstops as specified in other sections and according to manufacturer's instructions. Securely position waterstops at joints as indicated on Drawings. Protect waterstops from damage or displacement during concrete placing operations.

3.4 BATCHING, MIXING AND DELIVERY OF CONCRETE

- A. Measure, batch, mix, and deliver ready-mixed concrete in accordance with ASTM C 94, Sections 8 through 11. Produce ready-mixed concrete using an automatic batching system as described in NRMCA Concrete Plant Standards, Part 2 - Plant Control Systems.
- B. Measure, mix and deliver concrete produced by volumetric batching and continuous mixing in accordance with ASTM C 685, Sections 6 through 8.
- C. Maintain concrete workability without segregation of material and excessive bleeding. Obtain approval of the Engineer before adjustment and change of mix proportions.
- D. Ready-mixed concrete delivered to the site shall be accompanied by batch tickets providing the information required by ASTM C 94, Section 16. Concrete produced by continuous mixing shall be accompanied by batch tickets providing the information required by ASTM C 685, Section 14.
- E. When high temperatures are expected, prepare ingredients, place, cure and protect in accordance with ACI 301, ACI 305.1, and as follows:

1. When high air temperatures are expected that would affect quality of concrete, postpone concrete placement. Do not mix concrete when air temperature is at or above 95 degrees F and rising.
 2. Maintain concrete temperature below 90 degrees F at the time of placement, furnish test data or other proof that admixtures and mix ingredients for not produce flash set plastic shrinkage, or cracking as a result of heat of hydration and the ambient air temperatures. Cool ingredients before mixing to maintain fresh concrete temperatures as specified or less.
 3. Provide windbreaks, shading, fog spraying, sprinkling, wet cover or other means as necessary to maintain at or below specified temperature.
- F. When adverse weather conditions affect quality of concrete, postpone concrete placement. Do not mix concrete when air temperature is at or below 40 degrees F and falling. Concrete may be mixed when temperature is 35 degrees F and rising. Take temperature readings in the shade, away from artificial heat. Protect concrete from temperatures below 32 degrees F until the concrete has cured for a minimum of 3 days at 70 degrees F or 5 days at 50 degrees F.
- G. Clean, maintain and operate equipment so that it thoroughly mixes material as required.
- H. Hand-mix only when approved by the Engineer.

3.5 PLACING CONCRETE

- A. Give sufficient advance notice to the Engineer (at least 24 hours prior to commencement of operations) to permit inspection of forms, reinforcing steel, embedded items and other preparations for placing concrete. Place no concrete prior to the Engineer's approval.
- B. Schedule concrete placing to permit completion of finishing operations in daylight hours. However, if necessary, to continue after daylight hours, light the site as required. If rainfall occurs after placing operations are started, provide covering to protect the work.
- C. Use troughs, pipes and chutes lined with approved metal or synthetic material in placing concrete so that concrete ingredients are not separated. Keep chutes, troughs and pipes clean and free from coatings of hardened concrete. Allow no aluminum material to be in contact with concrete.
- D. Limit free fall of concrete to 4 feet. Do not deposit large quantities of concrete at one location so that running or working concrete along forms is required. Do not jar forms after concrete has taken an initial set; do not place any strain on projecting reinforcement or anchor bolts.
- E. Use tremies for placing concrete in walls and similar narrow or restricted locations. Use tremies made in sections, or provide in several lengths, so that outlet may be adjusted to proper height during placing operations.
- F. Compact each layer of concrete with concrete spading implements and mechanical vibrators of approved type and adequate number for the size of placement. When immersion vibrators

cannot be used, use form vibrators. Apply vibrators to concrete immediately after depositing. Move the vibrator vertically through the layer of concrete just placed and several inches into plastic layer below. Do not penetrate or disturb layers previously placed which have partially set. Do not use vibrators to aid lateral flow concrete. Closely supervise consolidation to ensure uniform insertion and duration of immersion.

G. Handling and Placing Concrete: Conform to ACI 302.1R, ACI 304R and ACI 309R.

3.6 WATERSTOPS

- A. Embed waterstops in concrete across joints as shown. Waterstops shall be continuous for the extent of the joint; make splices necessary to provide such continuity in accordance with manufacturer's instructions. Support and protect waterstops during construction operations; repair or replace waterstops damaged during construction.
- B. Install waterstops in concrete on one side of joints, leaving other side exposed until the next pour. When a waterstop will remain exposed for 2 days or more, shade and protect the exposed waterstop from direct rays of the sun during the entire exposure and until the exposed portion of the waterstop is embedded in concrete.
- C. Splicing PVC Waterstops:
 - 1. Splice waterstops by heat-sealing adjacent waterstop sections in accordance with the manufacturer's printed instructions.
 - 2. Butt end-to-end joints of two identical waterstop sections may be made in the forms during placement of waterstop material.
 - 3. Prior to placement in formwork, prefabricate waterstop joints involving more than two ends to be joined together, an angle cut, an alignment change, or the joining of two dissimilar waterstop sections, allowing not less than 24-inch long strips of waterstop material beyond the joint. Upon inspection and approval by the Engineer, install prefabricated waterstop joint assemblies in formwork, and butt-weld ends of the 24-inch strips to the straight-run portions of waterstop in the forms.
- D. Setting PVC Waterstops:
 - 1. Correctly position waterstops during installation. Support and anchor waterstops during progress of the work to ensure proper embedment in concrete and to prevent folding over of the waterstop by concrete placement. Locate symmetrical halves of waterstops equally between concrete pours at joints, with center axis coincident with joint openings. Thoroughly work concrete in joint vicinity for maximum density and imperviousness.
 - 2. Where a waterstop in a vertical wall joint does not connect with any other waterstop and is not intended to be connected to a waterstop in a future concrete placement, terminate the waterstop 6 inches below the top of the wall.

- E. Replacement of Defective Field Joints: Replace waterstop field joints showing evidence of misalignment, offset, porosity, cracks, bubbles, inadequate bond or other defects with products and joints complying to the Specifications.
- F. Resilient Waterstop:
1. Install resilient waterstop in accordance with manufacturer's instructions and recommendations.
 2. When requested by the Engineer, provide technical assistance by manufacturer's representative in the field at no additional cost to the Owner.
 3. Use resilient waterstop only where complete confinement by concrete is provided; do not use in expansion or contraction joints.
 4. Where resilient waterstop is used in combination with PVC waterstop, lap resilient waterstop over PVC waterstop a minimum of 6 inches and place in contact with the PVC waterstop. Where crossing PVC at right angles, melt PVC ribs to form a smooth joining surface.
 5. At the free top of walls without connecting slabs, stop the resilient waterstop and grooves (where used) 6 inches from the top in vertical wall joints.
6. Bentonite Waterstop:
- a. Locate bentonite waterstop as near as possible to the center of the joint and extend continuous around the entire joint. Minimum distance from edge of waterstop to face of member: 5 inches.
 - b. Where thickness of concrete member to be placed on bentonite waterstop is less than 12 inches, place waterstop in grooves at least 3/4-inch-deep and 1-1/4 inches wide formed or ground into concrete. Minimum distance from edge of waterstop placed in groove to face of member: 2.5 inches.
 - c. Do not place bentonite waterstop when waterstop material temperature is below 40 degrees F. Waterstop material may be warmed so that it remains above 40 degrees F during placement but means used to warm it shall in no way harm the material or its properties. Do not install waterstop where air temperature falls outside manufacturer's recommended range.
 - d. Place bentonite waterstop only on smooth and uniform surfaces; grind concrete smooth if necessary, to produce satisfactory substrate, or bond waterstop to irregular surfaces using an epoxy grout which completely fills voids and irregularities beneath the waterstop material. Prior to installation, wire brush the concrete surface to remove laitance and other substances that may interfere with bonding of epoxy.

- e. In addition to the adhesive backing provided with the waterstop, secure bentonite waterstop in place with concrete nails and washers at 12-inch maximum spacing.
7. Adhesive Waterstop:
- a. With a wire brush thoroughly clean the concrete surface on which the waterstop is to be placed and then coat with primer.
 - b. If the surface is too rough to allow the waterstop to form a complete contact, grind to form an adequately smooth surface.
 - c. Install the waterstop with the top protective paper left in place. Overlap joints between strips a minimum of 1 inch and cover back over with protective paper.
 - d. Do not remove protective paper until just before final formwork completion. Concrete shall be placed immediately. The time that the waterstop material is uncovered prior to concrete placement shall be minimized and shall not exceed 24 hours.

3.7 CONSTRUCTION JOINTS

A. Definitions:

- 1. Construction joint: Contact surface between plastic (fresh) concrete and concrete that has attained initial set.
- 2. Monolithic: Manner of concrete placement to reduce or eliminate construction joints; joints other than those indicated on Drawings will not be permitted without written approval of Engineer. Where so approved, make additional construction joints with details equivalent to those indicated for joints in similar locations.
- 3. Preparation for Construction Joints: Roughen surface of concrete previously placed, leaving some aggregate particles exposed. Remove laitance and loose materials by sandblasting or high-pressure water blasting. Keep surface wet for several hours prior to placing of plastic concrete.

3.8 CURING

- A. Comply with ACI 308. Cure by preventing loss of moisture, rapid temperature change and mechanical injury for a period of 7 curing days when Type II or IP cement has been used and for 3 curing days when Type III cement has been used. Start curing as soon as free water has disappeared from the concrete surface after placing and finishing. A curing day is any calendar day in which the temperature is above 50 degrees F for at least 19 hours. Colder days may be counted if air temperature adjacent to concrete is maintained above 50 degrees F. In continued cold weather, when artificial heat is not provided, removal of forms and shoring may be permitted at the end of calendar days equal to twice the required number of

curing days. However, leave soffit forms and shores in place until concrete has reached the specified 28-day strength, unless directed otherwise by the Engineer.

- B. Cure formed surfaces not requiring rubbed-finished surface by leaving forms in place for the full curing period. Keep wood forms wet during the curing period. Add water as needed for other types of forms. Or, at Contractor's option, forms may be removed after 2 days and curing compound applied.

C. Finishes:

1. Broom Finish:

- a. After completion of straightedge operation, make first pass of traverse broom as soon as construction operations permit and before water sheen has disappeared from surface. Follow with as many passes as required to produce desired textured depth. Permit no unnecessary delays between passes. Keep drag wet, clean and free from encrusted mortar during use.

2. Rubbed Finish:

- a. At formed surfaces requiring rubbed finish, remove forms as soon as practicable without damaging the surface and immediately apply rub completely within 4 hours.
- b. After rubbed-finish operations are complete, continue curing formed surfaces by using either approved curing/sealing compounds or moist cotton mats until normal curing period is complete.

D. Unformed Surfaces: Cure by membrane curing compound method.

- 1. After concrete has received a final finish and surplus water sheen has disappeared, immediately seal surface with a uniform coating of approved curing compound, applied at the rate of coverage recommended by manufacturer or as directed by the Engineer. Do not apply less than 1 gallon per 180 square feet of area. Provide satisfactory means to properly control and check rate of application of the compound.
- 2. Thoroughly agitate the compound during use and apply by means of approved mechanical power pressure sprayers equipped with atomizing nozzles. For application on small miscellaneous items, hand-powered spray equipment may be used. Prevent loss of compound between nozzle and concrete surface during spraying operations.
- 3. Do not apply compound to a dry surface. If concrete surface has become dry, thoroughly moisten surface immediately prior to application. At locations where coating shows discontinuities, pinholes or other defects, or if rain falls on a newly coated surface before film has dried sufficiently to resist damage, apply an additional coat of compound at the specified rate of coverage.

3.9 REMOVAL OF FORMS AND SHORING

- A. Remove forms from surfaces requiring rubbing only as rapidly as rubbing operation progresses. Remove forms from vertical surfaces not requiring rubbed-finish when concrete has aged for the required number of curing days. When curing compound is used, do not remove forms before 2 days after concrete placement.
- B. Leave soffit forms and shores in place until concrete has reached the specified 28-day strength, unless directed otherwise by the Engineer.

3.10 DEFECTIVE WORK

- A. Immediately repair any defective work discovered after forms have been removed. If concrete surface is bulged, uneven, or shows excess honeycombing or form marks which cannot be repaired satisfactorily through patching, remove and replace the entire section.

3.11 FINISHING

- A. Patch honeycomb, minor defects and form tie holes in concrete surfaces with carr-bond and verticoat or approved equal. Repair defects by cutting out unsatisfactory material and replacing with new concrete, securely keyed and bonded to existing concrete. Finish to make junctures between patches and existing concrete as inconspicuous as possible. Use a stiff mixture and thoroughly tamp into place. After each patch has stiffened sufficiently to allow for greatest portion of shrinkage, strike off mortar flush with the surface.
- B. Apply a rubbed finish to exposed surfaces of formed concrete structures as noted on Drawings. After pointing has set sufficiently, wet the surface with a brush and perform first surface rubbing with No. 16 carborundum stone, or approved equal. Rub sufficiently to bring surface to paste, to remove form marks and projections, and to produce a smooth, dense surface. Add cement to form surface paste as necessary. Spread or brush material, which has been ground to paste, uniformly over surface and allow to reset. In preparation for final acceptance, clean surfaces and perform final finish rubbing with No. 30 carborundum stone or approved equal. After rubbing, allow paste on the surface to reset; then wash surface with clean water. Leave structure with a clean, neat and uniform-appearing finish.
- C. Apply a wood float finish to concrete slabs.

3.12 FIELD QUALITY CONTROL

- A. Testing shall be performed under provisions of Section 01 45 29 - Testing Laboratory Services.
- B. Unless otherwise directed by Engineer, the following minimum testing of concrete is required. Testing shall be performed by qualified individuals employed by an approved independent testing agency and conform to the requirements of ASTM C 1077.
 - 1. Take concrete samples in accordance with ASTM C 172.

2. Make one set of four compression test specimens, or as directed by the Engineer, for each mix design at least once per day and for each 150 cubic yards or fraction thereof. Make, cure and test the specimens in accordance with ASTM C 31 and ASTM C 39.
 3. When taking compression test specimens, test each sample for slump according to ASTM C 143, for temperature according to ASTM C 1064, for air content according to ASTM C 231, and for unit weight according to ASTM C 138.
 4. Inspect, sample and test concrete in accordance with ASTM C 94, Section 13, 14, and 15, and ACI 311-5R.
- C. Test Cores: Conform to ASTM C 42.
- D. Testing High Early Strength Concrete: When Type III cement is used in concrete, the specified 7-day and 28-day compressive strengths shall be applicable at 3 and 7 days, respectively. For Early Strength Concrete, a set of 5 specimen cylinders shall be required.
- E. If 7-day or 3-day test strengths (as applicable for type of cement being used) fail to meet established strength requirements, extended curing or resumed curing on those portions of structure represented by test specimens may be required. If additional curing fails to produce the required strength, strengthening or replacement of portions of structure which fail to develop required strength may be required by the Engineer, at no additional cost to the Owner.

3.13 PROTECTION

- A. Protect concrete against damage until final acceptance by the Owner.
- B. Protect fresh concrete from damage due to rain, hail, sleet, or snow. Provide such protection while the concrete is still plastic, and whenever such precipitation is imminent or occurring.
- C. Do not backfill around concrete structures or subject them to design loadings until components of the structure needed to resist the loading are complete and have reached the specified 28-day compressive strength, except as authorized otherwise by the Engineer.

END OF SECTION

SECTION 331413
WATERLINE PIPEWORK

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section shall cover the furnishing, laying, jointing and testing of all water pipe, including water appurtenances, both in open cut and in tunnels, as shown on the drawings, or as directed by the Engineer.

1.2 UNIT PRICES

- A. Unit Prices.
1. Payment for water mains installed by open-cut or augered, with or without casing, is on a linear foot basis for each size of pipe installed.
 2. Payment for water services installed by open-cut or augered, with or without casing, is on a unit price basis for each diameter service, long and short services.
 3. No separate payment will be made for water pipe branches associated with fire hydrant assemblies. Include cost of such pipework in Contract unit prices for items listed in bid form requiring fire hydrants.
 4. No separate payment will be made for waterline fittings associated with pipe work, unless listed in the contract unit prices. Include cost of such items in the Contract unit prices for items listed in bid form requiring waterline pipework.
 5. No separate payment will be made for thrust blocks and pipe restraints associated with pipe work. Include cost of such items in the Contract unit prices for items listed in bid form requiring waterline pipework.
 6. Payment of valves will be on a unit price basis for each valve installed for each size and type of valve.
 7. Payment of fire hydrants will be on a unit basis for each fire hydrant assembly installed. Fire hydrant assembly include connecting tee, water pipe branches (regardless of length), gate valve, fire hydrant and necessary restraints and thrust blocking.

PART 2 - PRODUCTS

2.1 MATERIAL

The material used in pipe work shall be furnished by the Contractor, as approved by the Owner, to meet the requirements of the Work of the Contractor as specified herein.

- A. Water Pipe - Use PVC compounds in the manufacture of pipe that contain no ingredient in an amount that has been demonstrated to migrate into water in quantities considered to be toxic. Provide pipe, which is homogeneous throughout, free of voids, cracks, inclusions, and other defects, uniform as commercially practical in color, density, and other physical properties. Deliver pipe with surfaces free from nicks and scratches with joining surfaces of spigots and joints free from gouges and imperfections which could cause leakage. For PVC pressure pipe used for water mains, provide self-extinguishing PVC pipe that bears Underwriters' Laboratories mark of approval and is acceptable without penalty to Texas State Fire Insurance Committee for use in fire protection lines.
1. Water pipe for main lines may be of any of the following classifications. Any pipe found defective, not meeting the specifications, or improperly installed, shall be rejected and so marked, and shall be replaced by pipe approved by the Owner at no additional cost to the Owner.
 - a. Polyvinyl chloride pipe for waterlines 14-inch diameter or greater shall conform to or exceed Ultra-Blue AWWA C-909 Molecularly Oriented Polyvinyl Chloride (PVCO); nominal 20-foot lengths; cast-iron equivalent outside diameter. All waterline piping shall be the color WHITE. Gaskets shall meet the requirements of ASTM F 477. Use elastomeric factory-installed gaskets to make joints flexible and watertight. Do not use PVC gasket material for water mains in potentially contaminated areas.
 - b. Polyvinyl chloride pipe for waterlines 6-inch to 12-inch shall conform to or exceed AWWA F1483 Ultra-Blue Class 200 Molecularly Oriented Polyvinyl Chloride (PVCO); nominal 20-foot lengths; steel pipe equivalent outside diameters. All waterline piping shall be the color WHITE. Gaskets shall meet the requirements of ASTM F 477. Use elastomeric factory-installed gaskets to make joints flexible and watertight. Do not use PVC gasket material for water mains in potentially contaminated areas.
 - c. Pipe 6 through 12-inch: Certain Teed Certalok Yelomine SDR21 Class 200 (ASTM D2241) RJ Restrained Joint PVC Pipe; nominal 20-foot lengths; steel pipe equivalent outside diameters.
 - d. Pipe 14-inch and greater: Certain Teed Certalok DR25 C905 RJ Restrained Joint PVC Pipe; nominal 20-foot lengths; steel pipe equivalent outside diameters.
 - e. Pipe 6-inch through 12-inch: Fusible AWWA C-900 DR-25 PVC; nominal 20, 30, or 40-foot lengths; steel pipe equivalent outside diameters.
 - f. Pipe 14-inch through 36-inch: Fusible AWWA C-905 DR-25 PVC; nominal 20, 30, or 40-foot lengths; steel pipe equivalent outside diameters.
 2. Waterline Fittings - Fittings for water lines may be of any of the following classifications.
 - a. Fittings for polyvinyl chloride (PVC) pipe 4-inch through 12-inch shall meet AWWA Standard C-100 or C153 "Ductile-Iron Compact Fittings, 3 inch through 12 inch for

Water and Other Liquids," and C104, latest revision, and shall be sized to fit PVC water pipe. No adapters for fittings with outside diameters different from PVC pipe shall be used. All fittings shall be coated on the interior with AWWA C-550, Induron 3300 or approved equal, non-toxic, impacts no taste to water, functions as physical, chemical and electrical barrier between base material and surroundings, minimum 10-mil wet thickness, fusion-bonded epoxy. Exterior surfaces shall be prime coated with asphaltic coating conforming to ANSI A 21.10, ANSI A 21.15, or ANSI A 21.51 for pipe and fittings in open cut excavation and in casings. All fittings shall be wrapped in a plastic protector in conformance with AWWA Standard C-105 and ANSI A21.5 (2.5 to 3 percent carbon black content, low or high density) "Polyethylene Encasement for Gray and Ductile Cast-Iron piping for Water and Other Liquids" and conforming to ASTM D 1248. Fitting wrapping shall be installed in such a manner as to curtail or prevent corrosion of the metallic fittings.

- (1) Flanged Fittings: ANSI A 21.10; ANSI B 16.1 cast or ductile iron. Flanges: ANSI B 16.1, Class 125; pressure rated at 250 psig. Bolts shall be corten or carbon steel with greased ends.
- (2) Mechanical Joint Fittings: ANSI A 21.11 (AWWA C 110); pressure rated at 250 psi. Bolts shall be corten or carbon steel with greased ends.
- (3) Restraining Joints:
 - a. Fittings: Mega Lug by Ebaa Iron Inc. or JCM 610 Sur-Grip Fitting Restrainer by JCM Industries, Inc., or approved equal.
 - b. Bell and Spigot: Mega Lug by Ebaa Iron Inc. or JCM 610 Sur-Grip Fitting Restrainer by JCM Industries, Inc., or approved equal.
- (4) Flexible (Dresser Type) Coupling
 - a. Install where shown on Drawings or where allowed by the Engineer for Contractor's convenience. Use galvanized flexible couplings when installed on galvanized pipe which is cement lined, or when underground. Provide gaskets manufactured from Neoprene, Buna-N, or approved equal.
 - b. For steel pipe; sleeve-type flexible couplings, Smith-Blair type, or approved equal. Thickness of middle ring equal to or greater than thickness of pipe wall.
 - c. Flanged adapter couplings for steel pipe; Dresser Style 128, Rockwell Type 913, or approved equal.
 - d. Use Type 316 stainless steel bolts, nuts and washers where flexible couplings are installed underground. Coat entire coupling with 20-mil of T.C. Mastic as manufactured by the Tape Coat Company, Inc., Bitumastic No. 50 as manufacturer by Koppers Company, Inc., or approved equal.

(5) Victaulic Joints: Make joint with Victaulic Style 77 coupling fitted with Grade H molded synthetic rubber gasket or approved equal.

- b. Fittings for polyvinyl chloride (PVC) Schedule 40 pipe less than 4 inch shall conform to ASTM Standard D2466, latest revision.
- c. Taps for PVC Water Mains: Use Mueller SS Stainless Steel Service Saddle with all 304SS exterior hardware or approved equal. Saddle shall be flanged, machined recess, AWWA C207, Class D, ANSI 150-pound drilling. Flange bolts shall be 304SS or 316SS. Saddle to include gasket affixed around recess of tap opening to prevent rolling or binding during installation.

Any fittings found defective, not meeting the specifications, or improperly installed, shall be rejected and so marked, and shall be replaced by fittings approved by the Owner, at no additional cost to the Owner.

- 3. Service Connections - Water service connections shall be installed as per the design plans and as approved by the Utility Owner.
 - a. Provide Type K annealed, seamless, copper tubing: 3/4-inch to 2-inch in diameter conforming to requirements of ASTM B88 and manufactured in the USA. Provide 3/4-inch to 2-inch in diameter tubing in coils of minimum 60-feet in length. Provide flared or compression-type brass fittings for use with Type K annealed copper tubing in accordance with AWWA C800.
 - b. Cross-linked polyethylene (PEX) water service line shall conform to AWWA C904.
 - c. Polyvinyl chloride casing for water service lines shall be Schedule 40 PVC and shall conform to ASTM Standard "Polyvinyl Chloride (PVC) Plastic Pipe" D-1785, latest revision.
 - d. Provide bronze service clamp taps (Ford Meter Box, Mueller Company or approved equal) for water main and service sizes shown in the design plans. Angled curb stops, corporation stops, and other brass fittings shall meet AWWA C 800 as manufactured by Ford Meter Box or Mueller Company. Curb stops shall be compression-type fitting inlet end with O-ring straight plug type and Teflon ball valve. Curb stop female outlets shall be iron-pipe thread or swivel-nut, meter-spud thread on 3/4-inch and 1-inch stops and 2-hole flange on 1-1/2 and 2-inch sizes.

Any material found defective, not meeting the specifications, or improperly installed, shall be rejected and so marked and shall be replaced with material approved by the Owner's Engineer at no additional cost to the Owner. Service line tubing crossings under traveled roadways shall be installed as specified on the plans with a minimum cover of 30" below roadway surface.

- 4. Valves

- a. Gate valves (2 to 16-inch diameter) shall conform to the following:
 - (1) Non-directional, resilient seated (AWWA C 509), 200 psig, bronze mounting, Mechanical Joint ends, and nut-operated unless otherwise specified. Provide resilient seated valves manufactured by Mueller 2360 Series or approved equal.
 - (2) Design: Fully encapsulated rubber wedge or rubber seat ring mechanically attached with minimum 304 stainless-steel fasteners or screws; threaded connection isolated from water by compressed rubber around opening.
 - (3) Body: Cast iron, flange bonnet and stuffing box together with 304 SS or 316 SS bolts. Manufacturer's initials, pressure rating, and year manufactured shall be cast in body.
 - (4) Bronze: Valve components in waterway to contain no more than 15 percent zinc and not more than 2 percent aluminum.
 - (5) Stems: ASTM B 763 bronze, alloy number 995 minimum yield strength of 40,000 psi; minimum elongation in 2-inches of 12 percent, non-rising.
 - (6) O-rings: AWWA C 509, sections 2.2.6 and 4.8.2.
 - (7) Stem Seals: Consist of three O-rings, two above and one below thrust collar with anti-friction washer located above thrust collar.
 - (8) Stem Nut: Independent or integrally cast of ASTM B 62 bronze.
 - (9) Resilient Wedge: Molded, synthetic rubber, vulcanized and bonded to cast or ductile iron wedge or attached with 304 stainless steel screws tested to meet or exceed ASTM D 2000; seat against epoxy-coated surface in valve body.
 - (10) Bolts: AWWA C 509 Section 4.4; 304 or 316 stainless steel only.
 - (11) Direct bury Valves open counterclockwise.
 - (12) Coatings: AWWA C-550, Induron 3300 or approved equal, non-toxic, impacts no taste to water, functions as physical, chemical and electrical barrier between base material and surroundings, minimum 10-mil wet thickness, fusion-bonded epoxy. Prior to assembly of valve, apply protective coating to internal and exterior surfaces of body.
 - b. Gate valves (greater than 16-inch diameter) shall be cast iron body conform to the following: Non-directional, resilient seated (AWWA C 509), 200 psig, bronze mounting, Mechanical Joint ends, and nut-operated unless otherwise specified. Provide resilient seated valves manufactured by Mueller 2361 Series, or approved equal, and meeting the requirements in Section 4a above.
5. Fire Hydrants - Provide fire hydrants manufactured by Mueller Super Centurion 250, or approved equal. Fire hydrants shall conform to AWWA Standard "Dry-Barrel Fire Hydrants" C502, latest revision. Hydrants shall be cast iron, fully bronze mounted and have a working pressure of 150 psi. Fire hydrants shall have a minimum valve opening of 5 1/4 inch. Hydrants shall be furnished with Hydrant Defender with barrel lock. Apply finish coat of Silicone Alkyd Resin Enamel, Acro Products No. 2215, or approved equal meeting SSPC Paint Specification No. 21. Total dry film thickness (DFT): 2 to 3 mils. Exception: Hydrants shall be painted RED with WHITE bonnets.
 6. Air and Vacuum Release Valves: Provide combination air valves designed to fulfill functions of air release (permit escape of air accumulated in line at high point of

elevation while line is under pressure) and vacuum relief. Air release and vacuum relief valves 8 inches and smaller in diameter shall be self-contained in one unit. Provide inlet and outlet connections, and orifice as shown on Drawings. Use ARI D-040 Air Release Valve or approved equal.

PART 3 - EXECUTION

3.1 CONSTRUCTION METHODS

A. PIPE LAYING

1. All water mains shall be installed as specified in plans with a minimum cover of 48 inches from the top of pipe to an established grade. Where pipe is installed beneath State Highways, there shall be a minimum vertical distance of 4 feet from top of pipe to the lowest pavement elevation on the highway, or as per the Highway Department's permit requirements. In special locations, Highway Department may require additional cover. Construction clearance and other requirements to cross under State Highways shall be obtained by Owner. Where pipe is installed beneath drainage or irrigation ditches, there shall be a minimum vertical distance of 3 feet from top of pipe to the flowline of the ditch, or as shown in the design plans or by permit requirements. Where pipe is installed beneath railroad tracks, there shall be a minimum vertical distance of 4 feet-6 inches from the top of pipe casing to top of railroad ties, or as shown in the design plans or by permit requirements. Utility crossing permits to cross under railroad track will be obtained from Railroad Authority by Owner. Any expense associated with permit costs, insurance requirements, construction bracing or supports to tracks during excavation operation beneath trackage shall be considered the responsibility of the Contractor and part of the Contract.
2. For all pipe, the Contractor shall familiarize himself with the TCEQ Chapter 290 and 217 Separation Distance Requirements and verify that all proposed work conforms to these regulations. The Contractor shall immediately notify Utility Owner and the Engineer once the Contractor discovers that field conditions cannot meet the TCEQ Separation Distance Requirements.
3. Inform the Utility Owner if any un-metered connections exist which are not shown on the design plans. Make transfer only after approval by the Utility Owner.
4. Procedure - After the trench is excavated to grade as specified, it shall be backfilled in accordance with the details shown in the design plans. Bedding material shall provide a smooth and uniform pipe bed for the entire length of the water pipe barrel. Trenching and pipe laying shall be uniformly in a straight line and to uniform elevation unless otherwise specified on plans. Pipe, fittings and valves shall be carefully handled to avoid damage. Before placing pipe into the trench, the outside of the spigot and the inside of the bell shall be wiped clean and dry, free from oil and grease. Every precaution shall be taken to prevent foreign material from entering the pipe. During layout operation, no debris, tools, clothing or other material shall be placed into the pipe. After placing a length of pipe in the trench, the spigot end shall be centered in the bell; the pipe forced

home, brought to the correct alignment and covered with an approved backfill material. Detectable warning metallic tape with "Waterline Below" shall be buried above pipe at a depth of 18 inches below finished grade for surface locating purposes. The minimum width of the metallic tape shall be 6-inches wide as manufactured by Presco Detectable Warning Tape or approved equal. At times when pipe laying is not in progress, the open ends of pipe shall be closed by a watertight plug or other approved means. This provision shall apply during the noon hour as well as overnight. If water is in the trench, the seal shall remain in place until the trench is pumped completely dry.

- B. PIPE JOINTING - In laying the water pipe to line and grade, the pipe shall be jointed in accordance with one of the following approved jointing methods. Owner reserves the right, before construction, or while construction is in progress, to change the type of joints if Owner's Engineer so directs.
1. Asbestos Cement Pipe Jointing - The Contractor shall furnish and install asbestos cement pipe in accordance with AWWA Standard "Installation of Asbestos Cement Pressure Pipe" C603-78, latest revision. The machined ends of the pipe to be jointed, coupling grooves and rubber rings shall be cleaned immediately before assembly. Care should be taken not to roll, pinch or reverse the gasket when placed in the bell. Each pipe joint shall be sealed with a coupling consisting of an asbestos cement sleeve and two rubber rings or an equivalent coupling or joint of equivalent strength and performance, as determined by Engineer. The pipe joint shall not be deflected either vertically or horizontally beyond the limits recommended by the manufacturer.
 2. Polyvinyl Chloride (PVC) Pipe Jointing - The Contractor shall make certain before jointing polyvinyl chloride pipe that the ring groove in the bell of the pipe is clean, with no dirt or foreign material that could interfere with proper seating of the ring. Make sure pipe end is clean. Wipe with a clean dry cloth around the entire circumference from the end to one inch beyond the reference mark. Lubricate the spigot end of the pipe, using only the lubricant supplied by the manufacturer. Be sure the entire circumference is covered. The coating should be the equivalent of a brush coat of enamel paint. It can be applied by hand, cloth, pad, sponge or glove. Do not lubricate the ring groove in the bell to avoid lubrication causing ring displacement. The level end is then inserted into the bell so that it is in contact with the ring. Brace the bell, while the level end is pushed in under the ring, so that previously completed joints in the line will not be closed. The spigot end is pushed until the reference mark on the spigot end is flush with the end of the bell. DO NOT OVER INSERT BEYOND THE REFERENCE MARK. If undue resistance to inserting of the level end is encountered or the reference mark does not reach the flush position, disassemble the joint and check the position of the ring. If it is twisted or pushed out of its seat, clean the ring, bell and level end and repeat the assembly steps.

Make curves and bends by deflecting joints or other method as recommended by the pipe manufacturer and approved by the Utility Owner. Contractor may submit details of other methods or providing curves and bends for considerations by the Utility Owner, and if accepted, shall be installed at no additional cost to the Owner. Deflection of pipe joints shall not exceed maximum deflection recommended by pipe manufacturer. If deflection exceeds that specified but is less than 5-percent, repair entire deflected pipe section such

that maximum deflection allowed is not exceeded. If deflection is equal to or exceeds 5-percent from that specified, remove entire portion of deflected pipe section with new pipe. Assessment of pipe deflection will be measured by the Engineer at any location along the pipe. Arithmetical averages or deflection or similar average measurement methods will not be deemed as meeting intent of standard. When rubber gasketed pipe is laid on a curve, join pipe in a straight alignment and then deflect to curved alignment.

- C. WET CONNECTIONS - Schedules of existing fittings and proposed new fittings needed to make wet connections to existing waterlines as shown on the plans are estimates only. It is to be recognized that after existing lines and fittings are uncovered, that some discrepancies may occur. Where discrepancies occur, the Contractor shall request a decision by the Owner as to how the connection in question shall be made. Additional fittings shall be included in the costs associated with applicable bid items. Contractor shall plan his work concerning wet connections in such a way that a minimum of inconvenience shall occur to existing water customers due to water service interruptions. Before water service interruptions are made to any customer, Contractor shall notify designated official and cooperate with operating personnel in every way to minimize service interruptions due to wet conditions. In certain locations, other utility lines or conduits will be obstructing the normal path of proposed waterlines. In such instances, gravity lines of all kinds hold priority as to grade over water pressure lines, gas lines, electric conduits, or other obstruction conduits or combinations of conduits, which may be encountered. Contractor shall analyze conditions carefully, while considering TCEQ Chapter 290 separation distance requirements, and then use best judgment in determining proper method of proceeding through obstructed area with waterline construction, and shall notify the Owner forty-eight (48) hours in advance of making such connection after obtaining approval from the Owner's Engineer.
- D. APPURTENANCES - Appurtenances to the waterline shall be provided and laid in accordance with the drawings and in the manner as specified herein.
1. Valves. Valves shall be installed with restraining joints and concrete thrust blocks (braced against undisturbed soil) at the locations shown and as specified in the design plans. All valves shall be wrapped in a plastic protector in conformance with AWWA Standard C-105 and ANSI A21.5 "Polyethylene Encasement for Gray and Ductile Cast-Iron piping for Water and Other Liquids." Valve wrapping shall be installed in such a manner as to curtail or prevent corrosion of the metallic valves.
 2. Fire Hydrants. All fire hydrants shall be located as shown in the plans, and in a manner to provide complete accessibility, and to minimize the possibility of damage from vehicles or injury to pedestrians. All hydrants shall stand plumb with the pumper nozzle facing the curb (or as shown in the design plans) and the bury line of the hydrant at the finished grade. A 12-inch gravel pocket (in all directions) shall be installed around the drain ports. Do not cover drain ports when placing concrete thrust block. Located nozzle center line a minimum 18-inches above finished grade. Fire hydrants installed near State Highways shall be in accordance with State Department of Highways and Public Transportation requirements. Set fire hydrant plumb and brace at locations and grades as shown on Drawings. When barrel of hydrant passes through concrete slab, place a 1-inch-thick piece of standard sidewalk expansion joint material around section of barrel

passing through concrete. All fire hydrants shall be connected to the main in the manner shown in the design plans. Place 12-inch x 12-inch yellow indicators (plastic, sheet metal, plywood, or other material approved by the Owner) on pumper nozzles of new or relocated fire hydrants installed on new mains not in service. Remove indicators after new main is tested and approved by the Owner. Install Hydrant defenders upon removal of indicators.

3. Services. Set service taps at right angles to proposed meter location and locate taps in upper pipe segment within 0 degrees of pipe springline. Tapped collars of appropriate sizes: Approved in new construction only provided they are set at right angles to proposed meter location. Use tapping machine manufactured for pressure tapping purposes for 2-inch and smaller service taps on pressurized water mains. Install service lines in open-cut trench in accordance with Section 31 23 23.13 - Excavation and Backfill for Utilities except that service lines under paved roadways, other paved areas and areas indicated on Drawings shall be installed in cased bored hole in accordance with paragraph 3.01G.

Lay service lines with minimum of 48 inches of cover as measured from top of curb or, in absence of curbs, from centerline elevation of crowned streets or roads. Provide minimum of 18 inches of cover below flow line of ditches to service lines.

Service lines across existing street (push-unders): Pull service line through prepared hole under paving. Only full lengths of tubing shall be used. Take care not to damage copper tubing when pulling it through hole. A compression-type union is only permitted if Contractor cannot span underneath pavement with a full length of tubing. Contractor is allowed one compression-type union for each full length of tubing, provided it is not under the pavement.

Maintain service lines free of dirt and foreign matter.

Set curb stops or angle stops at outer end of service line inside of meter box. Secure opening in curb stop to prevent unwanted material from entering. In close quarters, make an S-curve in the field. Do not flatten tube. In 3/4-inch and 1-inch services, install meter coupling, swivel-nut, or curb stop ahead of meter. Install straight meter coupling on outlet end of meter.

Install service lines so that top of meter will be 3 to 6 inches below finished grade.

Locate water meters one foot inside property line, or if this is not feasible, one foot inside street right-of-way. Contact Utility Owner when major landscaping or trees conflict with service line and meter box location.

3.2 TESTING AND STERILIZATION

- A. TESTING. All newly laid sections of pipe shall be hydrostatically tested at a gauge pressure of 150 psi. Contractor has the option of running hydrostatic test before or after trench has been completely backfilled. Trenches must be at least partially backfilled before hydrostatic

testing to prevent pipe shift. Hydrostatic tests shall be in accordance with AWWA Standard C600 Section 4 "Hydrostatic Testing" latest revision.

1. Hydrostatic Test Procedure - The Contractor shall provide all necessary equipment, water, safety, and other appurtenances necessary for testing procedures. All waterlines shall be disinfected prior to hydrostatic testing. Allow pipeline to sit a minimum of 24 hours from time it is initially disinfected until testing begins, to allow pipe wall or lining material to absorb water. Periods of up to 7 days may be required for mortar lining to become saturated. All testing procedures shall be conducted in the presence of the Owner. Air pressure testing will not be allowed. For large diameter water mains, test waterlines in lengths between valves or plugs, but no greater than 4,400 feet in length. Small diameter waterlines shall be tested in lengths between valves or plugs of not more than 2,800 feet in length.
 2. Furnish, install and operate connections, pump, meter and gauges necessary for hydrostatic testing. The line shall be slowly filled with water to the specified test pressure. The lowest elevation point of the section being tested shall be determined and any corrections necessary shall be corrected to the elevation of the test gauge by means of a hand pump, gasoline or electrically driven test pump connected to the pipe. A blow off or fire hydrant shall be installed at the end of the line under test. Before applying the specified test pressure, all air shall be expelled from the test section including service connections. If hydrants or blow offs are not available at high places, tap at points of highest elevation shall be made before the test is made and brass plugs inserted after the test has been completed. After all air is expelled, apply a minimum hydrostatic pressure of 150 psi. Begin test by 4 p.m., unless otherwise approved by the Owner. Maintain test pressure until 8 a.m. the following morning. If large quantity of water is required to maintain pressure during test, testing shall be discontinued until cause of water loss is identified and corrected. Leakage tests shall be conducted concurrently with pressure tests. Owner will inspect all pipe, fittings, valves and joints under tests. Any faults found to be due to improper workmanship shall be corrected by the Contractor at no expense to Owner. Allowable pressure loss is a maximum of 5-psi leakage over the 16-hour, overnight test period. If this pressure requirement is failed 3 (three) times, use AWWA Standard C600 Section 4 "Hydrostatic Testing" latest revision.
- B. STERILIZATION. Pipeline construction shall be in accordance with Section 4 of AWWA Standard C651-01, latest revision. Upon or during completion of the hydrostatic test, the new section of pipe shall be sterilized in accordance with AWWA Standard "Disinfecting Water Mains" C601, latest revision; and the State of Texas Health Standards. Chlorine may be applied by the following methods: Continuous Feed Method and Chlorine Tablet Method. Contractor shall provide all equipment and chemicals necessary for sterilization.

Use required temporary blind flanges, cast-iron sleeves, plugs, and other items needed to facilitate disinfection of new mains prior to connection to the Owner's water distribution system. Normally, each valve section of water line requires two each 3/4-inch taps. A 2-inch minimum blow-off is required for water lines up to and including 6-inch diameter. Fire hydrants shall be used as blow-offs to flush newly constructed water lines 8-inch diameter and above. Where fire hydrants are not available on water lines, locations and designs for

blow-offs shall be as indicated on Drawings. Install temporary blow-off valves and remove promptly upon successful completion of disinfection and testing.

Slowly fill each section of pipe with water in a manner approved by the Owner. Average water velocity when filling pipeline should be less than one foot per second and shall not, under any circumstance, exceed 2 feet per second. Before beginning disinfection operations, expel air from pipeline.

1. Continuous Feed Method - This method is suitable for general application. Water from the existing distribution system or other approved sources of supply shall be made to flow at a constant, measured rate into the newly laid pipeline. The water shall receive a dose of chlorine, also fed at a constant, measured rate. The two rates shall be proportioned so that the chlorine concentration in the water in the pipe is maintained at a minimum of 50 mg/l available chlorine. During the application of the chlorine, valves shall be manipulated to prevent the treatment dosage from flowing back into the line supplying the water. Chlorine application shall not cease until the entire main to be tested is filled with the chlorine solution. The chlorine water shall be retained in the main for at least 24 hours during which time all valves and hydrants in the section treated shall be operated in order to disinfect the appurtenances. At the end of this 24-hour period, the treated water shall contain no less than 25 mg/l chlorine throughout the length of the main.
2. Chlorine Tablet Method - Tablet disinfection is best suited to short extensions (up to 2,500 feet) and smaller diameter mains (up to 8-inch diameters). Because the preliminary flushing step must be eliminated, this method shall be used only when scrupulous cleanliness has been exercised. It shall not be used if trench water or foreign material has entered the main or if the water is below 5°C (41°F). Calcium hypochlorite tablets are placed in each section of pipe and in hydrants, hydrant branches and other appurtenances. They shall be attached by an adhesive, except for the tablets placed in hydrants and in the joints between the pipe sections. All the tablets within the main must be at the top of the main. If the tablets are fastened before the pipe section is placed in the trench, their position should be marked on the section to assure that there will be no rotation. In placing tablets in joints, either crushed or placed on the inside annular space or, if the type of assembly does not permit, they are rubbed like chalk on the butt ends of the sections to coat them with calcium hypochlorite. The adhesive may be Permatex No. 1 or any alternative approved by the Owner. There shall be no adhesive on the tablet except on the broad side next to the surface to which the tablet is attached. If desired, the calcium hypochlorite may be placed in the pipe in granular form at a rate of one (1) cup (4 fl. oz.) per each pipe. When installation has been completed, the main shall be filled with water at a velocity of less than 1-ft./sec. This water shall remain in the pipe for at least 24 hours. Valves shall be manipulated so that the strong chlorine solution in the line being treated will not flow back into the line supplying the water.
3. Final Flushing - After the applicable retention period, the heavily chlorinated water shall be flushed from the main until the chlorine concentration in the water leaving the main is no higher than that generally prevailing in the system, or less than 1 mg/l. Chlorine residual determination shall be made to ascertain that the heavily chlorinated water has been removed from the pipeline.

4. Bacteriologic Tests - After final flushing, and before the water main is placed in service, a sample or samples shall be collected from the end of the line and tested for bacteriologic quality and shall show the absence of coliform organisms. If the number and frequency of samples is not prescribed by the public health authority having jurisdiction, at least one sample shall be collected from chlorinated supplies when the chlorine residual is maintained throughout the new main. From unchlorinated supplies, at least two samples shall be collected at least 24 hours apart. In the case of extremely long mains, it is desirable that samples be collected the length of the line as well as at its end. Samples for bacteriologic analysis shall be collected in sterile bottles treated with sodium thiosulfate. No hose or fire hydrant shall be used in collection of samples. A suggested sampling tap consists of a standard corporation cock installed in the main with a copper tube gooseneck assembly. After samples have been collected, the gooseneck assembly may be removed and retained for future use.
5. Repetition of Procedure. If the initial disinfection fails to produce satisfactory samples, disinfection shall be repeated until satisfactory samples have been obtained. The tablet method cannot be used in these subsequent disinfections. When the samples are satisfactory, the main may be placed in service.

END OF SECTION

SECTION 333111

SANITARY SEWER PIPEWORK

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Under this section is included the furnishing, laying, jointing and testing of all sewer pipe, including sewer pipe and sewer appurtenances, both in open cut and in tunnels, as shown on the drawings or as directed by the Engineer.

1.2 UNIT PRICES

- A. Unit Prices.
 - 1. Payment for normal depth sanitary sewer, up to 8 feet deep, by open-cut or augered with or without casing is on a linear foot basis for each size of pipe. Depth is measured from bottom of the pipe to the proposed natural ground. Separate pay items are used for open-cut and augered installation.
 - 2. Payment for sanitary sewer, greater than 8-foot in depth, by open-cut or augered is on a linear foot basis for each 2-foot increment for depths greater than 8 feet. Depth is measured from bottom of the pipe to the proposed natural ground.
 - 3. Payment for normal depth manholes, up to 8 feet deep, is on a unit price basis for each manhole installed. Depth is measured from proposed top of cover to sewer invert.
 - 4. Payment for manholes, greater than 8-foot in depth, is on a unit price for each manhole installed for each 2-foot increment. Depth is measured from proposed top of cover to sewer invert.
 - 5. Payment for sanitary service connections in on a unit price for each single, double, short and long service connection installed.
 - 6. Payment for force mains installed by open-cut or augered with or without casing is on a linear foot basis for each size of pipe installed. Separate pay items are used for open-cut and augered installation.

PART 2 - PRODUCTS

2.1 MATERIAL

- A. Gravity Sewer Pipe
 - 1. Gravity sewer pipe may be of any of the following classifications. Any pipe found defective, not meeting the specifications, or improperly installed shall be rejected and so marked and shall be replaced by pipe approved by the Engineer at no additional cost to Utility Owner.

- a. Pipe and fittings shall be manufactured in conformance with the materials and methods described in ASTM Specification D-3034. Joint seals shall be compression type rubber gaskets in compliance with the requirements of ASTM Specification D-1869.
- b. Pipe and fittings shall be manufactured in conformance with the materials and methods described in ASTM Specification F-789 and UNI-B-10. Gaskets shall comply with the requirements of ASTM Specification F-477.

2. Manholes

- a. Manholes shall be constructed of glass fiber-reinforced isophalic polyester resin containing chemically enhanced sand for use in sanitary sewer applications. They shall be a one-piece unit of one class, fabricated in a composite laminate. Walls shall be of uniform thickness and shall be free from thin spots and voids. Exterior surface shall be free of ridges and sharp protrusions and reinforcement. Interior surface shall also be smooth and free of ridges to allow for self-cleaning. The exterior surface shall be covered with graded sand to facilitate bonding to the concrete base pad, cement stabilized sand backfill and cement grout used to seal around all incoming lines. Manholes shall conform to the following design criteria:
 1. ASTM D-3753 "Standard Specification of Glass-Fiber reinforced Polyester Manholes."
 2. ASTM C-581 "Practice for determining chemical resistance of chemical thermosetting resins used in glass-fiber reinforced structures intended for liquid Service."
 3. ASTM D-2412 "Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel Plate Loading."
 4. ASTM D-695 "Test Methods for Compressive Properties of Rigid Plastics."
 5. ASTM D-2584 "Test Method for Ignition Loss of Cured Reinforced Resins."
 6. AASHTO H-20 Axial Loading Nominal inside diameter of the manhole shall be 48".
Thickness of the manhole shall be 0.50" nominal. Height shall be selected in accordance with project plans.
- b. Dimensions: The manhole shall be a circular cylinder, reduced at the top to a circular manway not smaller than 30" inside diameter. Manholes shall be produced in half-foot increments in length $\pm 2"$. Nominal inside diameters shall be 48", 60", and 72" as shown in the design details. Tolerance on the inside diameter shall be $\pm 1\%$.
- c. Configuration: The manway reducing cone section shall be centered on the manhole barrel and must provide a bearing surface on which a standard ring and cover may be supported and adjusted to grade. The reducer shall be joined to the barrel section at the factory with resin and glass fiber reinforcement, thus providing required monolithic design to prevent infiltration and/or exfiltration through the manhole.

- d. Loading: The manhole shall be manufactured in one class of load rating. This class shall be H-20 wheel load (minimum 16,000 pounds dynamic wheel load).
- e. Manufacturer and Certification: The manholes shall be Containment Solutions, Inc. Flowtite Fiberglass Manholes or approved equal that conforms to ASTM D.3753-81, Standard Specifications for Fiberglass Reinforced Polyester Manholes and all noted applicable documents. The manufacturer shall submit written certification that their product meets the requirements of ASTM D. 3753-81 with test results of specified manholes included.

B. Force Mains

- 1. Pressure sewer pipe will be the following classification. Any pipe found defective, not meeting the specifications, or improperly installed shall be rejected and so marked and shall be replaced by pipe approved by the Engineer at no additional cost to Utility Owner.
 - a. Polyvinyl chloride pipe for force mains shall conform to AWWA Standard "Polyvinyl Chloride (PVC) Pressure Pipe" C-900 - 750 Class 100 DR25 latest revision. Fittings for polyvinyl chloride (PVC) pipe shall be Ductile Iron Class 125 "Compact Fittings" short body, tar coated (not cement lined). Transition gaskets shall also be included, unless otherwise noted on the contract bid document or drawings.
 - b. Polyvinyl chloride pipe for directional bored force mains shall conform to Fusible AWWA C-900 DR-25 PVC.

C. Service Connections

- 1. Property service connections shall be installed using Polyvinyl Chloride Pipe (PVC). The pipe type shall be specified in the service line detail shown in the design plans.

D. Concrete Surface Coatings

- 1. All interior manhole concrete surfaces shall be coated with 8mils of Raven 155 epoxy primer and 125 mils of Raven 405 – 100% solids, solvent-free ultra-high build epoxy system manufactured by Raven Lining Systems, Broken Arrow, Oklahoma or Engineer approved equal.

PART 3 - EXECUTION

3.1 CONSTRUCTION METHODS

- A. For all pipe, the Contractor shall familiarize himself with the TCEQ Chapter 217 Separation Distance Requirements and verify that all proposed work conforms to these regulations. The Contractor shall immediately notify Utility Owner and the Engineer once the Contractor discovers that field conditions cannot meet the TCEQ Chapter 217 Separation Distance Requirements.

- B. After the trench is excavated to grade as specified, it shall be filled to grade with a minimum 6-inch bank run sand layer, in accordance with 31 06 20.16 - Utility Backfill Materials. This material shall be mechanically tamped to a density minimum of 90%. This material shall provide a smooth and uniform pipe bed for the entire length of the sewer pipe barrel. Trench foundation preparation may require dewatering, gravel bedding, or cement stabilized sand to create a stable foundation for pipe installation. Stable foundation conditions and trench improvements will be at the direction of the Utility Owner Inspector or the Engineer and at no additional costs to the Owner.
- C. Trenching and pipe laying shall be uniformly in a straight line and to uniform elevations unless otherwise specified on the plans. Pipe and fittings shall be carefully handled to avoid damage. Before placing pipe into the trench, the outside of the spigot and the inside of the bell shall be wiped clean and dry, free from oil and grease. Every precaution shall be taken to prevent foreign material from entering the pipe. During layout operation, no debris, tools, clothing or other material shall be placed into the pipe. After placing a length of pipe into the trench, the spigot end shall be centered in the bell, the pipe forced home, brought to the correct alignment and covered with an approved backfill material. Detectable warning metallic tape with "Sewer Line Below" shall be buried as directed by the Utility Owner inspector, but no greater than 4' below the finished grade. The width of the metallic tape shall be 6-inches wide or as specified by the manufacturer.
- D. Watertight Joint Materials: The contractor must exert every reasonable effort to secure a watertight joint and prevent infiltration of ground water into or exfiltration of sewage out of all pipe sewers and property service connections. Any joint materials found to be defective or not meeting the specifications shall be rejected and replaced by approved joint materials at no additional cost to Utility Owner.
- E. Polyvinyl Chloride Pipe (PVC) Jointing: The contractor shall make certain before jointing polyvinyl chloride pipe that the ring groove in the bell of the pipe is clean with no dirt or foreign material that could interfere with proper seating of the ring. Make sure pipe end is clean. Wipe with a clean dry cloth around the entire circumference from the end to one (1) inch beyond the reference mark. Lubricate the spigot end of the pipe, using only the lubricant supplied by the manufacturer. Be sure the entire circumference is covered. The coating shall be the equivalent of a brush coat of enamel paint. It can be applied by hand, cloth, pad, sponge, or glove. Do not lubricate the ring groove in the bell to avoid lubrication causing ring displacement. The level end is then inserted into the bell so that it is in contact with the ring. Brace the bell, while the level end is pushed in under the ring, so that previously completed joints in the line will not be close. The spigot end is pushed until the reference mark on the spigot end is flush with the end of the bell. If undue resistance to insertion of the level end is encountered or the reference mark does not reach the flush position, disassemble the joint and check the position of the ring. If it is twisted or pushed out of its seat, lean the ring, bell and level end and repeat the assembly steps.

Water stop joints shall be Polyvinyl Chloride (PVC) or other similar approved joint materials.

- F. Sewer Appurtenances - Appurtenances to the sewer shall be provided and laid in accordance with the drawings and in the manner as specified herein. Appurtenances in addition to those

required by the drawings or the proposal, as approved or directed by the Engineer, shall be paid for under the appropriate items of the proposal.

- G. Service Branches and Fittings - Branches and fittings shall be provided and laid as and where directed. T-branches and Y-branches, placed in the sewer for property service connections, shall be located by the contractor, as directed by the Engineer, at such points in the sewer so as to result in the property service connection having the shortest length possible between the sewer and property line or easement line, unless otherwise indicated on the drawing or directed by the Engineer.

The Contractor shall install all service lines in accordance with TCEQ separation distance and Southern Building Code requirements. Contractor shall notify the Inspector or Engineer prior to the installation of any service that is in question in accordance to the TCEQ separation or Southern Building Code requirements. Where not approved street grade has been established, the depth of the connection shall be based on the assumed future street grade or on the present street or ground surface, as determined by the Engineer. At times when pipe laying is not in process, the open ends of the pipe shall be closed by a watertight plug or other approved means. This provision shall apply during the noon hour as well as overnight. If water is in the trench, the seal shall remain in place until the trench is pumped completely dry.

- H. Stubs - Stubs for future sewer pipe shall be installed as indicated by the drawings. If the specified length of the stub is exceeded, there will be no additional cost to Utility Owner unless the extra length is ordered by the Engineer. Existing sewer pipe stubs shall be removed as required, but only when directed by the Engineer.
- I. Stacks - Stacks shall be constructed as and where directed. The height of the stack shall be as indicated on the drawings, set forth in the proposal, as determined by the Engineer. The stack shall encased in-concrete in accordance with the Design Plans.
- J. Drop Inlets - Drop inlets to the manhole shall be constructed as and where indicated by the drawings of either of the types shown on the Design Plans, as directed by the Engineer.
- K. Cleanouts - Cleanouts on all service laterals shall be installed at the location shown on the plans and in accordance with the Design Plans.
- L. Manholes - Manholes shall be constructed as shown in Design Plans to the elevations shown on the plan-profile sheets, and in accordance with manufacturer's installation instructions.
 - 1. Prepare excavation at manhole location should be at least 12-inches wider than the proposed concrete foundation slab specified and to provide working room around manhole.
 - 2. Verify the depth of manhole is sufficient to allow 12 to 18-inches from the finished grade and the cone support ring, as per design plans.
 - 3. For unstable trench foundation, provide a minimum of 4 to 6-inches of crushed limestone or 2-inch gravel, or until a stable foundation is achieved.
 - 4. Set manhole as per manufacturer's installation instructions. Level and plumb manhole and connect sewer lines to manhole with a seal ring as manufactured by Northtown Pipe

Protection Products or equal (as per ASTM C-923 requirements). A concrete base encasement shall be placed at least 12 inches outside of the diameter of the manhole and shall come over the top of the anti-flotation ring a minimum of 12 inches. All sides of incoming and outgoing sewer lines shall be covered with a minimum of 6-inches of concrete. Manhole levels shall be verified throughout the placement and finishing of concrete base construction.

5. Backfilling is allowed as soon as the concrete base has hardened enough to provide sufficient support for manhole and fill. Native soil (or bank run sand, as specified in Section 31 06 20.16 – Utility Backfill Materials, in unstable areas), free of large stones, debris, or concrete chunks may be used for backfill. Backfill should be placed evenly around manhole in 12" maximum loose lifts and should thoroughly tamped to 90% standard proctor density. Each layer shall be completely compacted before the next layer is installed to avoid uneven lateral pressure which could move the manhole out of plumb. Backfill material shall be subject to approval by the Engineer.
 6. Contractor shall maintain the stability of the excavation during backfilling of the manhole which includes both trench protection and dewatering efforts.
 7. To bring the manhole to finished grade and provide support for ring and cover, construct chimney using polyethylene rings by Lad Tech or approved equal.
- A. Concrete Coating - All concrete surfaces within the manhole shall be coated with 100% solids, solvent-free ultra-high build epoxy coating system. Surfaces to be coated shall be cleaned by sandblasting or by water-blasting with 10% muriatic acid prior to coating. Coating system shall consist of 125 mils of Raven 405 epoxy coating, applied in accordance with manufacturer's recommendations, alternative coating system approved in advance by Engineer.
- B. Stoppers and Bulkheads - Open ends of pipes and branches smaller than 15 inches in diameter shall be sealed with stoppers, plugs, or caps, cemented into place in an acceptable manner using a rubber gasket between the stopper and socket. All openings to the pipeline shall be satisfactorily protected from the entrance of earth, water or other material. If a temporary bulkhead is constructed to prevent sewage from backing into the trench excavation or to prevent foreign material from entering the sewer from the new sewer trench, the contractor shall be responsible for reconstructing, repairing, or replacing those portions of the existing sewers removed or damaged by his operations. Existing bulkheads shall be removed as indicated by the drawings or set forth in the proposal, but not until directed by the Engineer.

3.2 TESTING

- A. All sewer lines must be tested in accordance with 30 TAC §217.57. The Owner must retain copies of all test results which must be made available to the executive director upon request. The Owner must certify in writing that all wastewater lines have passed all required testing to the appropriate regional office within 30 days of test completion and prior to use of the new collection system.
1. For a collection system pipe that will transport wastewater by gravity flow, the design must specify an infiltration and exfiltration test or a low-pressure air test in accordance with ASTM F-1417.

- Low Pressure Air Exfiltration Testing: The following materials will be furnished by the contractor and utilized for air testing sewer mains:
- Compressor Air Supply: Any source which will provide at least three hundred (300) cubic feet per minute at one hundred (100) pounds per square inch. The compressor air supply shall be furnished by the contractor.

Plugs, valves, pressure gauges, air hose, connections and other equipment necessary to conduct the air test shall be furnished by the contractor. The test equipment for air testing will consist of valves, plugs, and pressure gauges used to control the rate at which air flows to the test section and to monitor the air pressure inside the plugs. Test equipment shall be assembled as follows:

- a. hose connection
 - b. shut off valve
 - c. throttle valve
 - d. pressure reduction valve
 - e. gauge cock
 - f. monitoring pressure gauge
- Test Procedures - The following procedures will be utilized for air testing sewer mains:
- Apply air pressure until the pressure inside the pipe reaches 4 psig.
- Allow the pressure inside the pipe to stabilize, then bleed back to 3.5 psig.
- At 3.5 psig, the time, temperature and pressure will be observed and recorded. A minimum of five (5) readings will be required for each test. If the time in seconds for the air pressure to decrease from 3.5 psig to 2.5 psig is greater than that shown in the following table, the pipe shall be presumed to be free from defect. When these rates are exceeded, pipe breakage, joint leakage, or leaking plugs are indicated and an inspection must be made to determine the cause. The contractor shall affect such repairs as may be required to accomplish a successful air test.

Table 1 Minimum Test Time for Various Pipe Sizes

Nominal Pipe Size, in.	T(time) min/100 ft.	Nominal Pipe Size, in.	T(time) min/100 ft.
3	0.2	21	3.0
4	0.3	24	3.6
6	0.7	27	4.2
8	1.2	30	4.8
10	1.5	33	5.4
12	1.8	36	6.0
15	2.1	39	6.6
18	2.4	42	7.3

- Leakage Test - A leakage test may be requested by the Owner to determine excessive infiltration and to assure that the sewer section is substantially watertight. The Engineer may order the contractor to make leakage tests of as many sections as may be necessary to determine whether the work complies with the criteria for the rate of leakage. A section shall consist of a reach from one manhole to the next manhole provided the manholes are at least 300 feet apart and preferably 400 feet. Leakage tests shall be conducted, and measurements made, for a minimum of one hour. The tests may be conducted over a longer period with no reduction in the rate of leakage.
- Leakage into Sewer - Leakage into the sewer including manholes, shall not exceed a rate of 50 gallons per 24 hours per inch diameter per mile of sewer. There shall be no gushing or spurting streams entering the sewer or manhole and where encountered they shall be repaired regardless of the rate of infiltration at no additional cost to Utility Owner. Where practicable, the tests for leakage into the sewers shall be made at a time when the groundwater level is at a maximum, but it must be at least one foot above the top of the pipe of the highest elevation in the section being tested.
- Leakage out of Sewer - Where the groundwater level is less than one foot above the top of the pipe and where conditions will permit, the sewers shall be subjected to an internal pressure by plugging the pipe at both ends and then filling the sewer and manholes with clean water to a height above the top of the pipe sufficient to obtain satisfactory measurements to determine the rate of leakage, but no less than 2-feet above the top of the upstream pipe. The rate of

leakage from the sewers will be determined by the amount of water volume lost during the testing period or by the volume of water needed to maintain the original water surface level. Leakage from the sewers under test shall not exceed a rate of 50 gallons per 24 hours per inch diameter per mile of sewer, except that an allowance of an additional 10 percent of gallonage shall be permitted for each additional 2 feet of head over a basic 2-foot minimum internal head.

- Requirements of the Contractor - The contractor shall construct such weirs or other means of measurements as may be required, shall furnish water and shall do all necessary pumping to enable the tests to be properly made. When a leakage test fails, the contractor shall do such other work as may be necessary until the rate of leakage meets the above requirements, as determined by additional leakage tests.
- Deflection Testing for Gravity PVC Sewer Lines
- No sooner than 30 days, nor later than 12 months after the pipe has been installed and backfilling has been completed, tests for deflection will be made. A deflection of more than 5 percent of the inside diameter of the pipe shall be cause for rejection, and the line will be removed and replaced at the contractor's expense. A GO-NO-GO Deflection Testing Mandrel, to be furnished by the contractor, and certified by the Owner and Engineer, shall be used. The testing shall consist of the following:
 - Completely flush the line, if required, making sure the pipe is clean of any mud or debris that would hinder the passage of the mandrel.
 - During the final flushing of the line, attach a floating block or ball to the end of the mandrel pull rope and float the rope through the line.
 - After the rope is threaded through the line, connect the pull rope to the mandrel and place the mandrel in the entrance of the rope.
 - Connect a retrieval rope to the back of the mandrel to pull it back if necessary.
 - Remove all slack in the pull rope and place a tape marker on the rope at the ends of the pipe where the mandrel will exit, determining the location of the mandrel in the line.
 - Using manhole guide pulleys, draw mandrel through the sewer line, if any irregularity of pipe deformation exceeding the allowable 5 percent is encountered in the line, the line shall be uncovered at the point.
 - If an obstructed or over-deflected section is found, locate it; uncover pipe; inspect the pipe; if any damaged pipe is found, replace it. Backfill as per design plans.

- Re-test this entire section for deflection.
- Any pipe removed shall be replaced by use of gasketed repair couplings. Every deflection test shall be conducted in the presence of the Owner's or Engineer's representative.
- The Contractor shall furnish all labor and material required to clean and flush and complete all testing required by this specification in accordance with Section f, below. The Owner, at their discretion, may televise the sewer lines. The Contractor shall furnish and install all required traffic control methods, as per TMUTCD, needed for the Owner to conduct the televising of the Work. If there is an insufficient roadway within the project area, the contractor will furnish the equipment necessary to gain full access to the site.
- Manhole Leakage Testing
 - After completion of manhole construction, wall sealing, or rehabilitation, but prior to backfilling, test manholes for water tightness using hydrostatic or vacuum testing procedures. Manholes shall be tested after installation with all connections (existing and/or proposed) in place. Final acceptance in accordance with the requirements of this specification will consist of vacuum testing of the completed and installed manhole in place to include manhole/adjustment rings and manhole casting. The Contractor shall furnish all labor and material required to complete all testing required by this specification.
 - Vacuum Testing: Vacuum testing shall be performed as follows:
 - Plug influent and effluent lines, including service lines, with suitably sized pneumatic or mechanical plugs. Ensure plugs are properly rated for pressures required for test; follow manufacturer's safety and installation recommendations. Place plugs a minimum of 6 inches outside of manhole walls. Brace inverts to prevent lines from being dislodged if lines entering manhole have not been backfilled. Install vacuum tester head assembly at top access point of manhole and adjust proper seal on straight top section of manhole structure. Following manufacturer's instructions and safety precautions, inflate sealing element to the recommended maximum inflation pressure; do not overinflate.
 - Evacuate manhole with vacuum pump to 10 inches mercury (Hg), disconnect pump, and monitor vacuum for two minutes.
 - If the vacuum pressure drop exceeds 1-inch Hg over a two-minute time period, locate leaks, complete repairs necessary to seal manhole and repeat test procedure until satisfactory results are obtained.
 - MATERIALS - Test equipment shall be assembled as follows:

- Engine
 - Vacuum Pump
 - Hose
 - Test Head Device capable of sealing opening in manhole casting as required.
 - Pneumatic test plugs – These plugs shall have a sealing length equal to or greater than the diameter of the connecting pipe to be sealed.
 - monitoring pressure gauge (rotameter)
- Hydrostatic Exfiltration Testing: Hydrostatic exfiltration testing shall be performed as follows:
 - Seal wastewater lines coming into the manhole with an internal pipe plug. Then, fill the manhole with water and maintain it full for at least one hour.
 - The maximum leakage for hydrostatic testing shall be 0.025 gallons per foot of manhole diameter per foot of manhole depth per hour.
 - If water loss exceeds amount tabulated above, locate leaks, complete repairs necessary to seal manhole and repeat test procedure until satisfactory results are obtained.
 - All testing shall be done by the contractor and witnessed by the Owner. All manholes and structures shall be tested as finished and completed for final acceptance.

Any defective work or materials shall be corrected or replaced by the contractor and retested. This shall be repeated until all work and materials are acceptable.

- Force Main Hydrostatic Testing
 - After the pipe and appurtenance have been installed, test line and drain. Prevent damage to the Work or adjacent areas. Use clean water to perform tests.
 - The Owner may direct tests of relatively short sections of completed lines to minimize traffic problems or potential public hazards.
 - Test pipe in the presence of the Owner.
 - Test pressures shall be at the normal operating pressure of the force main plus 50 psi. Normal operating pressure of the force main shall be the rated total dynamic head with all lift station pumps operating.
 - Test pipe at the required pressure for a minimum of 4 hours according to requirements TCEQ Chapter 217.68 requirements.

- Maximum allowable leakage shall be as calculated by the following formula:

$$L = (S) (D) (P^{0.5}) / 155,400$$

Where:

L = Acceptable Leakage (gallons/hour/1,000-feet of pipe, based on a leakage rate of 10 gallons per inch of diameter per mile of pipe per day).
 S = Length of pipe (feet).
 D = Inside diameter of pipe (inches).
 P = Pressure (pounds/square inch).

- Correct defects, cracks, or leakage by replacement of defective items or by repairs as approved by the Utility Owner.
- Plug openings in the force main after testing and flushing. Use cast iron plugs or blind flanges to prevent debris from entering the tested pipeline.
- Sanitary Sewer Television Inspection

The Owner, at their discretion, may televise the sewer lines to determine all sources and conditions of the leakage. The Owner will provide all personnel and televising equipment for the test.

- After construction of the sanitary sewer main and prior to placement of the final course of asphalt, the newly constructed sanitary sewer shall be televised immediately upon cleaning. Any abnormalities such as, but not limited to, misaligned joints, cracked/defected pipe, rolled gaskets, shall be repaired by the contractor at his expense. Sections requiring repair shall be re-televised to verify condition of repair. No additional compensation shall be provided for repair or re-televising.
- If necessary, the Contractor shall perform bypass pumping operations in accordance with all other specification requirements and as outlined below.
- The Contractor shall furnish all labor, supervision, tools, equipment, appliances, and materials to perform all operations in connection with bypass pumping of sewage flow for the purpose of preventing interference with the televising of the sanitary sewer manholes and mainlines as well as providing reliable sewer service to the occupants of the buildings being served.
- The Contractor will be required to provide adequate pumping equipment and force mains in order to maintain reliable sanitary sewer service in all sanitary sewer lines involved in this project. The Contractor shall notify the Owner should a surcharge occur during the televising process which results in overflows of sewage. In case of bypass equipment failure, the Contractor

shall discontinue work and release sewer flows until such time as equipment failure is corrected.

- The location of the pump(s), force main(s), and discharge points shall be approved by the Owner. Under no circumstances shall the flow be interrupted or stopped, such that damage is done to either private or public property, or sewage flows or overflows into a storm sewer or natural waterway.
- The Contractor shall provide bypass pumping of sewage around each segment(s) of pipe that is to be televised and shall be responsible for all required bulkheads, pumps, equipment, piping, and other related appurtenances to accomplish the sequence of pumping. A qualified person shall man the pumps, on-site, at all times during the bypassing procedure.
- All piping, joints, and accessories shall be designed to withstand the maximum bypass system pressure, or a minimum of 50 psi, whichever is greater. During bypass pumping, no sewage shall be leaked, dumped, or spilled into or onto any area outside of the existing sanitary sewer system. When bypass pumping operations are complete, all piping shall be drained into the sanitary sewer prior to disassembly.
- The Contractor shall demonstrate that the pumping system is in good working order and can successfully handle flows during cleaning and televising operations, prior to commencing with the cleaning and televising of the system.
- The Contractor shall be required to have all materials, equipment, and labor necessary to complete the repair or replacement on the jobsite prior to isolating the sewer manhole or line segment and beginning bypass pumping operations.
- The Contractor shall plug off and pump down the sewer manhole and/or line segment in the immediate work area and shall maintain the sanitary sewer system so that surcharging does not occur. The Contractor shall coordinate with all property owners to ensure that no damage will be caused to their property during any and all sewer televising work. The Contractor shall complete the televising as quickly as possible and shall satisfactorily meet all requirements prior to discontinuing bypass pumping operations and returning flow to the sewer manhole or line segment. The Contractor shall ensure that no damage will be caused to private property as a result of bypass pumping operations. Ingress and egress to adjacent properties shall always be maintained. Ramps, steel plates, or other methods shall be employed by the Contractor to facilitate traffic over surface piping.
- If sewage accidentally drains into the drainage system or is spilled within the project, the Contractor shall immediately stop the overflow, notify the

Owner, and take the necessary action to clean up and disinfect the spillage using an HTH, or equal, chemical.

- Traffic management shall be done under the approval of respective City, County, or State Traffic Departments. The Contractor shall not open cut existing streets to accommodate bypass pumping piping unless specific written approval is given.
- Pigging Test
- After completion of hydrostatic testing and prior to final acceptance, test force mains longer than 200 feet by pigging to ensure piping is free of obstructions.
- Pigs: Provide proving pigs manufactured of an open-cell polyurethane foam body, without any coating or abrasives which would scratch or otherwise damage interior pipe wall surface or lining. Pigs shall be able to pass through reductions of up to 65 percent of the nominal cross-sectional area of the pipe. Pigs shall be able to pass through standard fittings such as 45-degree and 90-degree elbows, crosses, tees, wyes, gate valves, or plug valves, as applicable to the force main being tested.
- Test Execution: Pigging test shall be conducted in the presence of the Utility Owner. Provide at least 48-hour notice of scheduled pigging of the force main prior to commencing the test.

END OF SECTION

Item 164

Seeding for Erosion Control



1. DESCRIPTION

Provide and install temporary or permanent seeding for erosion control as shown on the plans or as directed.

2. MATERIALS

- 2.1. **Seed.** Provide seed from the previous season's crop meeting the requirements of the Texas Seed Law, including the testing and labeling for pure live seed (PLS = Purity × Germination). Furnish seed of the designated species, in labeled unopened bags or containers to the Engineer before planting. Use within 12 mo. from the date of the analysis. When Buffalograss is specified, use seed that is treated with KNO₃ (potassium nitrate) to overcome dormancy.

Use Tables 1–4 to determine the appropriate seed mix and rates as specified on the plans. If a plant species is not available by the producers, the other plant species in the recommended seed mixture will be increased proportionally by the PLS/acre of the missing plant species.

Table 1
Permanent Rural Seed Mix

District and Planting Dates	Clay Soils		Sandy Soils	
	Species and Rates (lb. PLS/acre)		Species and Rates (lb. PLS/acre)	
1 (Paris) Feb. 1–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (Haskell)	3.2	Bermudagrass	1.5
	Bermudagrass	1.8	Bahiagrass (Pensacola)	6.0
	Little Bluestem (Native)	1.7	Sand Lovegrass	0.6
	Illinois Bundleflower	1.0	Weeping Lovegrass (Ermelo)	0.8
			Partridge Pea	1.0
2 (Ft. Worth) Feb. 1–May 15	Green Sprangletop (Van Horn)	1.0	Green Sprangletop (Van Horn)	1.0
	Sideoats Grama (Haskell)	1.0	Hooded Windmillgrass (Mariah)	0.2
	Texas Grama (Atascosa)	1.0	Shortspike Windmillgrass (Welder)	0.2
	Hairy Grama (Chaparral)	0.4	Hairy Grama (Chaparral)	0.4
	Shortspike Windmillgrass (Welder)	0.2	Slender Grama (Dilley)	1.0
	Little Bluestem (OK Select)	0.8	Sand Lovegrass (Mason)	0.2
	Purple Prairie Clover (Cuero)	0.6	Sand Dropseed (Borden County)	0.2
	Engelmann Daisy (Eldorado)	0.75	Partridge Pea (Comanche)	0.6
	Illinois Bundleflower	1.3	Little Bluestem (OK Select)	0.8
	Awnless Bushsunflower (Plateau)	0.2	Engelmann Daisy (Eldorado)	0.75
			Purple Prairie Clover	0.3
3 (Wichita Falls) Feb. 1–May 15	Green Sprangletop (Van Horn)	0.6	Green Sprangletop (Van Horn)	1.0
	Sideoats Grama (Haskell)	1.0	Hooded Windmillgrass (Mariah)	0.2
	Texas Grama (Atascosa)	1.0	Shortspike Windmillgrass (Welder)	0.2
	Hairy Grama (Chaparral)	0.4	Hairy Grama (Chaparral)	0.4
	Shortspike Windmillgrass (Welder)	0.2	Sand Lovegrass (Mason)	0.2
	Little Bluestem (OK Select)	0.8	Sand Dropseed (Borden County)	0.2
	Blue Grama (Hachita)	0.4	Partridge Pea (Comanche)	0.6
	Western Wheatgrass (Barton)	1.2	Little Bluestem (OK Select)	0.8
	Galleta Grass (Viva)	0.6	Engelmann Daisy (Eldorado)	0.75
	Engelmann Daisy (Eldorado)	0.75	Purple Prairie Clover (Cuero)	0.3
	Awnless Bushsunflower (Plateau)	0.2		
4 (Amarillo) Feb. 15–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (Haskell)	3.6	Weeping Lovegrass (Ermelo)	0.8
	Blue Grama (Hachita)	1.2	Blue Grama (Hachita)	1.0
	Buffalograss (Texoka)	1.6	Sand Dropseed (Borden Co.)	0.3
	Illinois Bundleflower	1.0	Sand Bluestem	1.8
			Purple Prairie Clover	0.5

Table 1 (continued)
Permanent Rural Seed Mix

District and Planting Dates	Clay Soils		Sandy Soils	
	Species and Rates (lb. PLS/acre)		Species and Rates (lb. PLS/acre)	
5 (Lubbock) Feb. 15–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (El Reno)	3.6	Weeping Lovegrass (Ermelo)	0.8
	Blue Grama (Hachita)	1.2	Blue Grama (Hachita)	1.0
	Buffalograss (Texoka)	1.6	Sand Dropseed (Borden Co.)	0.3
	Illinois Bundleflower	1.0	Sand Bluestem	1.8
			Purple Prairie Clover	0.5
6 (Odessa) Feb. 1–May 15	Green Sprangletop (Van Horn)	1.0	Green Sprangletop (Van Horn)	1.0
	Sideoats Grama (South Texas)	1.0	Hooded Windmillgrass (Mariah)	0.2
	Blue Grama (Hachita)	0.4	Blue Grama (Hachita)	0.4
	Galleta Grass (Viva)	0.6	Hairy Grama (Chaparral)	0.4
	Shortspike Windmillgrass (Welder)	0.2	Sand Lovegrass (Mason)	0.2
	Pink Pappusgrass (Maverick)	0.6	Sand Dropseed (Borden County)	0.2
	Alkali Sacaton (Saltalk)	0.2	Indian Ricegrass (Rim Rock)	1.6
	Plains Bristlegrass (Catarina Blend)	0.2	Sand Bluestem (Cottle County)	1.2
	False Rhodes Grass (Kinney)	0.1	Little Bluestem (Pastura)	0.8
	Whiplash Pappusgrass (Webb)	0.6	Purple Prairie Clover (Cuero)	0.3
	Arizona Cottontop (La Salle)	0.2		
7 (San Angelo) Feb. 1–May 1	Green Sprangletop (Van Horn)	1.0	Green Sprangletop (Van Horn)	1.0
	Sideoats Grama (Haskell)	1.0	Hooded Windmillgrass (Mariah)	0.2
	Texas Grama (Atascosa)	1.0	Shortspike Windmillgrass (Welder)	0.2
	Hairy Grama (Chaparral)	0.4	Hairy Grama (Chaparral)	0.4
	Shortspike Windmillgrass (Welder)	0.2	Sand Lovegrass (Mason)	0.2
	Little Bluestem (OK Select)	0.4	Sand Dropseed (Borden County)	0.2
	Blue Grama (Hachita)	0.4	Sand Bluestem (Cottle County)	1.2
	Western Wheatgrass (Barton)	1.2	Partridge Pea (Comanche)	0.6
	Galleta Grass (Viva)	0.6	Little Bluestem (OK Select)	0.8
	Engelmann Daisy (Eldorado)	0.75	Engelmann Daisy (Eldorado)	0.75
	Illinois Bundleflower (Sabine)	1.0	Purple Prairie Clover (Cuero)	0.3
8 (Abilene) Feb. 1–May 15	Green Sprangletop (Van Horn)	1.0	Green Sprangletop (Van Horn)	1.0
	Sideoats Grama (Haskell)	1.0	Hooded Windmillgrass (Mariah)	0.2
	Texas Grama (Atascosa)	1.0	Shortspike Windmillgrass (Welder)	0.2
	Hairy Grama (Chaparral)	0.4	Hairy Grama (Chaparral)	0.4
	Shortspike Windmillgrass (Welder)	0.2	Sand Lovegrass (Mason)	0.2
	Little Bluestem (OK Select)	0.4	Sand Dropseed (Borden County)	0.2
	Blue Grama (Hachita)	0.4	Sand Bluestem (Cottle County)	1.2
	Western Wheatgrass (Barton)	1.2	Partridge Pea (Comanche)	0.6
	Galleta Grass (Viva)	0.6	Little Bluestem (OK Select)	0.8
	Engelmann Daisy (Eldorado)	0.75	Engelmann Daisy (Eldorado)	0.75
	Illinois Bundleflower (Sabine)	1.0	Purple Prairie Clover (Cuero)	0.3
9 (Waco) Feb. 1–May 15	Green Sprangletop (Van Horn)	1.0	Green Sprangletop (Van Horn)	1.0
	Sideoats Grama (Haskell)	1.0	Hooded Windmillgrass (Mariah)	0.2
	Texas Grama (Atascosa)	1.0	Shortspike Windmillgrass (Welder)	0.2
	Hairy Grama (Chaparral)	0.4	Hairy Grama (Chaparral)	0.4
	Shortspike Windmillgrass (Welder)	0.2	Slender Grama (Dilley)	1.0
	Little Bluestem (OK Select)	0.8	Sand Lovegrass (Mason)	0.2
	Purple Prairie Clover (Cuero)	0.6	Sand Dropseed (Borden County)	0.2
	Engelmann Daisy (Eldorado)	0.75	Partridge Pea (Comanche)	0.6
	Illinois Bundleflower	1.3	Little Bluestem (OK Select)	0.8
	Awnless Bushsunflower (Plateau)	0.2	Engelmann Daisy (Eldorado)	0.75
			Purple Prairie Clover	0.3
10 (Tyler) Feb. 1–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Bermudagrass	1.8	Bermudagrass	1.8
	Bahiagrass (Pensacola)	9.0	Bahiagrass (Pensacola)	9.0
	Sideoats Grama (Haskell)	2.7	Weeping Lovegrass (Ermelo)	0.5
	Illinois Bundleflower	1.0	Sand Lovegrass	0.5
			Lance-Leaf Coreopsis	1.0
11 (Lufkin) Feb. 1–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Bermudagrass	1.8	Bermudagrass	2.1
	Bahiagrass (Pensacola)	9.0	Bahiagrass (Pensacola)	9.0
	Sideoats Grama (Haskell)	2.7	Sand Lovegrass	0.5
	Illinois Bundleflower	1.0	Lance-Leaf Coreopsis	1.0

Table 1 (continued)
Permanent Rural Seed Mix

District and Planting Dates	Clay Soils		Sandy Soils	
	Species and Rates (lb. PLS/acre)		Species and Rates (lb. PLS/acre)	
12 (Houston) Jan. 15–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Bermudagrass	2.1	Bermudagrass	2.4
	Sideoats Grama (Haskell)	3.2	Bahiagrass (Pensacola)	10.5
	Little Bluestem (Native)	1.4	Weeping Lovegrass (Ermelo)	1.0
	Illinois Bundleflower	1.0	Lance-Leaf Coreopsis	1.0
13 (Yoakum) Jan. 15–May 15	Green Sprangletop (Van Horn)	1.0	Green Sprangletop (Van Horn)	1.0
	Sideoats Grama (South Texas)	1.0	Hooded Windmillgrass (Mariah)	0.4
	Texas Grama (Atascosa)	1.5	Slender Grama (Dilley)	1.0
	Slender Grama (Dilley)	1.0	Hairy Grama (Chaparral)	0.8
	Shortspike Windmillgrass (Welder)	0.3	Shortspike Windmillgrass (Welder)	0.2
	Halls Panicum (Oso)	0.2	Purple Prairie Clover (Cuero)	0.6
	Plains Bristlegrass (Catarina Blend)	0.2	Partridge Pea (Comanche)	0.6
	Canada Wildrye (Lavaca)	2.0	Englemann Daisy (Eldorado)	1.0
	Illinois Bundleflower (Sabine)	1.3		
	Purple Prairie Clover (Cuero)	0.6		
14 (Austin) Feb. 1–May 15	Green Sprangletop (Van Horn)	1.0	Green Sprangletop (Van Horn)	1.0
	Sideoats Grama (South Texas)	1.0	Hooded Windmillgrass (Mariah)	0.2
	Texas Grama (Atascosa)	1.0	Shortspike Windmillgrass (Welder)	0.2
	Hairy Grama (Chaparral)	0.4	Hairy Grama (Chaparral)	0.4
	Shortspike Windmillgrass (Welder)	0.2	Slender Grama (Dilley)	1.0
	Little Bluestem (OK Select)	0.8	Sand Lovegrass (Mason)	0.2
	Purple Prairie Clover (Cuero)	0.6	Sand Dropseed (Borden County)	0.2
	Engelmann Daisy (Eldorado)	0.75	Partridge Pea (Comanche)	0.6
	Illinois Bundleflower (Sabine)	1.3	Little Bluestem (OK Select)	0.8
	Awnless Bushsunflower (Plateau)	0.2	Englemann Daisy (Eldorado)	0.75
			Purple Prairie Clover	0.3
15 (San Antonio) Feb. 1–May 1	Green Sprangletop (Van Horn)	1.0	Green Sprangletop (Van Horn)	1.0
	Sideoats Grama (South Texas)	1.0	Slender Grama (Dilley)	2.0
	Texas Grama (Atascosa)	1.0	Hairy Grama (Chaparral)	0.6
	Slender Grama (Dilley)	1.0	Shortspike Windmillgrass (Welder)	0.4
	Shortspike Windmillgrass (Welder)	0.2	Pink Pappusgrass (Maverick)	0.6
	Pink Pappusgrass (Maverick)	0.6	Plains Bristlegrass (Catarina Blend)	0.2
	Halls Panicum (Oso)	0.2	Hooded Windmillgrass (Mariah)	0.3
	Plains Bristlegrass (Catarina Blend)	0.2	Multi-flowered False Rhodes Grass	0.1
	False Rhodes Grass (Kinney)	0.1	(Hidalgo)	0.2
	Hooded Windmillgrass (Mariah)	0.2	Arizona Cottontop (La Salle)	
	Arizona Cottontop (La Salle)	0.2		
16 (Corpus Christi) Jan. 1–May 1	Green Sprangletop (Van Horn)	1.0	Green Sprangletop (Van Horn)	1.0
	Sideoats Grama (South Texas)	1.0	Slender Grama (Dilley)	2.0
	Texas Grama (Atascosa)	1.0	Hairy Grama (Chaparral)	0.6
	Slender Grama (Dilley)	1.0	Shortspike Windmillgrass (Welder)	0.4
	Shortspike Windmillgrass (Welder)	0.2	Pink Pappusgrass (Maverick)	0.6
	Pink Pappusgrass (Maverick)	0.6	Plains Bristlegrass (Catarina Blend)	0.2
	Halls Panicum (Oso)	0.2	Hooded Windmillgrass (Mariah)	0.3
	Plains Bristlegrass (Catarina Blend)	0.2	Multi-flowered False Rhodes Grass	0.1
	False Rhodes Grass (Kinney)	0.1	(Hidalgo)	0.2
	Hooded Windmillgrass (Mariah)	0.2	Arizona Cottontop (La Salle)	
	Arizona Cottontop (La Salle)	0.2		
17 (Bryan) Feb. 1–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Bermudagrass	1.5	Bermudagrass	1.5
	Sideoats Grama (Haskell)	3.6	Bahiagrass (Pensacola)	7.5
	Little Bluestem (Native)	1.7	Weeping Lovegrass (Ermelo)	0.6
	Illinois Bundleflower	1.0	Sand Lovegrass	0.6
			Lance-Leaf Coreopsis	1.0

Table 1 (continued)
Permanent Rural Seed Mix

District and Planting Dates	Clay Soils		Sandy Soils	
	Species and Rates (lb. PLS/acre)		Species and Rates (lb. PLS/acre)	
18 (Dallas) Feb. 1–May 15	Green Sprangletop (Van Horn)	1.0	Green Sprangletop (Van Horn)	1.0
	Sideoats Grama (Haskell)	1.0	Hooded Windmillgrass (Mariah)	0.2
	Texas Grama (Atascosa)	1.0	Shortspike Windmillgrass (Welder)	0.2
	Hairy Grama (Chaparral)	0.4	Hairy Grama (Chaparral)	0.4
	Shortspike Windmillgrass (Welder)	0.2	Slender Grama (Dilley)	1.0
	Little Bluestem (OK Select)	0.8	Sand Lovegrass (Mason)	0.2
	Purple Prairie Clover (Cuero)	0.6	Sand Dropseed (Borden County)	0.2
	Engelmann Daisy (Eldorado)	0.75	Partridge Pea (Comanche)	0.6
	Illinois Bundleflower	1.3	Little Bluestem (OK Select)	0.8
	Awnless Bushsunflower (Plateau)	0.2	Engelmann Daisy (Eldorado)	0.75
19 (Atlanta) Feb. 1–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Bermudagrass	2.4	Bermudagrass	2.1
	Sideoats Grama (Haskell)	4.5	Bahiagrass (Pensacola)	7.5
	Illinois Bundleflower	1.0	Sand Lovegrass	0.6
			Lance-Leaf Coreopsis	1.0
20 (Beaumont) Jan. 15–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Bermudagrass	2.7	Bermudagrass	2.1
	Sideoats Grama (Haskell)	4.1	Bahiagrass (Pensacola)	7.5
	Illinois Bundleflower	1.0	Sand Lovegrass	0.6
			Lance-Leaf Coreopsis	1.0
21 (Pharr) Jan. 15–May 15	Green Sprangletop (Van Horn)	1.0	Green Sprangletop (Van Horn)	1.0
	Sideoats Grama (South Texas)	1.0	Slender Grama (Dilley)	2.0
	Texas Grama (Atascosa)	1.0	Hairy Grama (Chaparral)	0.6
	Slender Grama (Dilley)	1.0	Shortspike Windmillgrass (Welder)	0.4
	Shortspike Windmillgrass (Welder)	0.2	Pink Pappusgrass (Maverick)	0.6
	Pink Pappusgrass (Maverick)	0.6	Plains Bristlegrass (Catarina Blend)	0.2
	Halls Panicum (Oso)	0.2	Hooded Windmillgrass (Mariah)	0.3
	Plains Bristlegrass (Catarina Blend)	0.2	Multi-flowered False Rhoades Grass	0.1
	False Rhodes Grass (Kinney)	0.1	(Hidalgo)	0.2
	Hooded Windmillgrass (Mariah)	0.2	Arizona Cottontop (La Salle)	
	Arizona Cottontop (La Salle)	0.2		
22 (Laredo) Jan. 15–May 1	Green Sprangletop (Van Horn)	1.0	Green Sprangletop (Van Horn)	1.0
	Sideoats Grama (South Texas)	1.0	Slender Grama (Dilley)	2.0
	Texas Grama (Atascosa)	1.0	Hairy Grama (Chaparral)	0.6
	Slender Grama (Dilley)	1.0	Shortspike Windmillgrass (Welder)	0.4
	Shortspike Windmillgrass (Welder)	0.2	Pink Pappusgrass (Maverick)	0.6
	Pink Pappusgrass (Maverick)	0.6	Plains Bristlegrass (Catarina Blend)	0.2
	Halls Panicum (Oso)	0.2	Hooded Windmillgrass (Mariah)	0.3
	Plains Bristlegrass (Catarina Blend)	0.2	Multi-flowered False Rhoades Grass	0.1
	False Rhodes Grass (Kinney)	0.1	(Hidalgo)	0.2
	Hooded Windmillgrass (Mariah)	0.2	Arizona Cottontop (La Salle)	
	Arizona Cottontop (La Salle)	0.2		
23 (Brownwood) Feb. 1–May 15	Green Sprangletop (Van Horn)	0.6	Green Sprangletop (Van Horn)	1.0
	Sideoats Grama (Haskell)	1.0	Hooded Windmillgrass (Mariah)	0.2
	Texas Grama (Atascosa)	1.0	Shortspike Windmillgrass (Welder)	0.2
	Hairy Grama (Chaparral)	0.4	Hairy Grama (Chaparral)	0.4
	Shortspike Windmillgrass (Welder)	0.2	Sand Lovegrass (Mason)	0.2
	Little Bluestem (OK Select)	0.8	Sand Dropseed (Borden County)	0.2
	Blue Grama (Hachita)	0.4	Partridge Pea (Comanche)	0.6
	Western Wheatgrass (Barton)	1.2	Little Bluestem (OK Select)	0.8
	Galleta Grass (Viva)	0.6	Engelmann Daisy (Eldorado)	0.75
	Engelmann Daisy (Eldorado)	0.75	Purple Prairie Clover (Cuero)	0.3
	Awnless Bushsunflower (Plateau)	0.2		

Table 1 (continued)

164

Permanent Rural Seed Mix

District and Planting Dates	Clay Soils		Sandy Soils	
	Species and Rates (lb. PLS/acre)		Species and Rates (lb. PLS/acre)	
24 (El Paso) Feb. 1–May 15	Green Sprangletop (Van Horn)	1.0	Green Sprangletop (Van Horn)	1.0
	Sideoats Grama (South Texas)	1.0	Hooded Windmillgrass (Mariah)	0.2
	Blue Grama (Hachita)	0.4	Blue Grama (Hachita)	0.4
	Galleta Grass (Viva)	0.6	Hairy Grama (Chaparral)	0.4
	Shortspike Windmillgrass (Welder)	0.2	Sand Lovegrass (Mason)	0.2
	Pink Pappusgrass (Maverick)	0.6	Sand Dropseed (Borden County)	0.2
	Alkali Sacaton (Saltalk)	0.2	Indian Ricegrass (Rim Rock)	1.6
	Plains Bristlegrass (Catarina Blend)	0.2	Sand Bluestem (Cottle County)	1.2
	False Rhodes Grass (Kinney)	0.1	Little Bluestem (Pastura)	0.8
	Whiplash Pappusgrass (Webb)	0.6	Purple Prairie Clover (Cuero)	0.3
25 (Childress) Feb. 1–May 15	Arizona Cottontop (La Salle)	0.2		
	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (El Reno)	2.7	Weeping Lovegrass (Ermelo)	1.2
	Blue Grama (Hachita)	0.9	Sand Dropseed (Borden Co.)	0.5
	Western Wheatgrass	2.1	Sand Lovegrass	0.8
	Galleta	1.6	Purple Prairie Clover	0.5
	Illinois Bundleflower	1.0		

Table 2

Permanent Urban Seed Mix

District and Planting Dates	Clay Soils		Sandy Soils	
	Species and Rates (lb. PLS/acre)		Species and Rates (lb. PLS/acre)	
1 (Paris) Feb. 1–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Bermudagrass	2.4	Bermudagrass	5.4
	Sideoats Grama (Haskell)	4.5		
2 (Ft. Worth) Feb. 1–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (El Reno)	3.6	Sideoats Grama (El Reno)	3.6
	Bermudagrass	2.4	Bermudagrass	2.1
	Buffalograss (Texoka)	1.6	Sand Dropseed (Borden Co.)	0.3
3 (Wichita Falls) Feb. 1–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (El Reno)	4.5	Sideoats Grama (El Reno)	3.6
	Bermudagrass	1.8	Bermudagrass	1.8
	Buffalograss (Texoka)	1.6	Sand Dropseed (Borden Co.)	0.4
4 (Amarillo) Feb. 15–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (El Reno)	3.6	Sideoats Grama (El Reno)	2.7
	Blue Grama (Hachita)	1.2	Blue Grama (Hachita)	0.9
	Buffalograss (Texoka)	1.6	Sand Dropseed (Borden Co.)	0.4
5 (Lubbock) Feb. 15–May 15			Buffalograss (Texoka)	1.6
	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (El Reno)	3.6	Sideoats Grama (El Reno)	2.7
	Blue Grama (Hachita)	1.2	Blue Grama (Hachita)	0.9
	Buffalograss (Texoka)	1.6	Sand Dropseed (Borden Co.)	0.4
6 (Odessa) Feb. 1–May 15			Buffalograss (Texoka)	1.6
	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (Haskell)	3.6	Sideoats Grama (Haskell)	2.7
	Blue Grama (Hachita)	1.2	Sand Dropseed (Borden Co.)	0.4
	Buffalograss (Texoka)	1.6	Blue Grama (Hachita)	0.9
7 (San Angelo) Feb. 1–May 1			Buffalograss (Texoka)	1.6
	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (Haskell)	7.2	Sideoats Grama (Haskell)	3.2
	Buffalograss (Texoka)	1.6	Sand Dropseed (Borden Co.)	0.3
			Blue Grama (Hachita)	0.9
8 (Abilene) Feb. 1–May 15			Buffalograss (Texoka)	1.6
	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (Haskell)	3.6	Sand Dropseed (Borden Co.)	0.3
	Blue Grama (Hachita)	1.2	Sideoats Grama (Haskell)	3.6
	Buffalograss (Texoka)	1.6	Blue Grama (Hachita)	0.8
			Buffalograss (Texoka)	1.6

Table 2 (continued)
Permanent Urban Seed Mix

District and Planting Dates	Clay Soils		Sandy Soils	
	Species and Rates (lb. PLS/acre)		Species and Rates (lb. PLS/acre)	
9 (Waco) Feb. 1–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Bermudagrass	1.8	Buffalograss (Texoka)	1.6
	Buffalograss (Texoka)	1.6	Bermudagrass	3.6
	Sideoats Grama (Haskell)	4.5	Sand Dropseed (Borden Co.)	0.4
10 (Tyler) Feb. 1–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Bermudagrass	2.4	Bermudagrass	5.4
	Sideoats Grama (Haskell)	4.5		
11 (Lufkin) Feb. 1–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Bermudagrass	2.4	Bermudagrass	5.4
	Sideoats Grama (Haskell)	4.5		
12 (Houston) Jan. 15–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (Haskell)	4.5	Bermudagrass	5.4
	Bermudagrass	2.4		
13 (Yoakum) Jan. 15–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (South Texas)	4.5	Bermudagrass	5.4
	Bermudagrass	2.4		
14 (Austin) Feb. 1–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Bermudagrass	2.4	Bermudagrass	4.8
	Sideoats Grama (South Texas)	3.6	Buffalograss (Texoka)	1.6
	Buffalograss (Texoka)	1.6		
15 (San Antonio) Feb. 1–May 1	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (South Texas)	3.6	Bermudagrass	4.8
	Bermudagrass	2.4	Buffalograss (Texoka)	1.6
	Buffalograss (Texoka)	1.6		
16 (Corpus Christi) Jan. 1–May 1	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (South Texas)	3.6	Bermudagrass	4.8
	Bermudagrass	2.4	Buffalograss (Texoka)	1.6
	Buffalograss (Texoka)	1.6		
17 (Bryan) Feb. 1–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Bermudagrass	2.4	Bermudagrass	5.4
	Sideoats Grama (Haskell)	4.5		
18 (Dallas) Feb. 1–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (El Reno)	3.6	Buffalograss (Texoka)	1.6
	Buffalograss (Texoka)	1.6	Bermudagrass	3.6
	Bermudagrass	2.4	Sand Dropseed (Borden Co.)	0.4
19 (Atlanta) Feb. 1–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Bermudagrass	2.4	Bermudagrass	5.4
	Sideoats Grama (Haskell)	4.5		
20 (Beaumont) Jan. 15–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Bermudagrass	2.4	Bermudagrass	5.4
	Sideoats Grama (Haskell)	4.5		
21 (Pharr) Jan. 15–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (South Texas)	3.6	Buffalograss (Texoka)	1.6
	Buffalograss (Texoka)	1.6	Bermudagrass	3.6
	Bermudagrass	2.4	Sand Dropseed (Borden Co.)	0.4
22 (Laredo) Jan. 15–May 1	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (South Texas)	4.5	Buffalograss (Texoka)	1.6
	Buffalograss (Texoka)	1.6	Bermudagrass	3.6
	Bermudagrass	1.8	Sand Dropseed	0.4
23 (Brownwood) Feb. 1–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (Haskell)	3.6	Buffalograss (Texoka)	1.6
	Bermudagrass	1.2	Bermudagrass	3.6
	Blue Grama (Hachita)	0.9	Sand Dropseed (Borden Co.)	0.4
24 (El Paso) Feb. 1–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (South Texas)	3.6	Buffalograss (Texoka)	1.6
	Blue Grama (Hachita)	1.2	Sand Dropseed (Borden Co.)	0.4
	Buffalograss (Texoka)	1.6	Blue Grama (Hachita)	1.8
25 (Childress) Feb. 1–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (El Reno)	3.6	Sand Dropseed (Borden Co.)	0.4
	Blue Grama (Hachita)	1.2	Buffalograss (Texoka)	1.6
	Buffalograss (Texoka)	1.6	Bermudagrass	1.8

Table 3
Temporary Cool Season Seeding

Districts	Dates	Seed Mix and Rates (lb. PLS/acre)
Paris (1), Amarillo (4), Lubbock (5), Dallas (18)	September 1–November 30	Tall Fescue 4.5 Western Wheatgrass 5.6 Wheat (Red, Winter) 34
Odessa (6), San Angelo (7), El Paso (24)	September 1–November 30	Western Wheatgrass 8.4 Wheat (Red, Winter) 50
Waco (9), Tyler (10), Lufkin (11), Austin (14), San Antonio (15), Bryan (17), Atlanta (19)	September 1–November 30	Tall Fescue 4.5 Oats 24 Wheat 34
Houston (12), Yoakum (13), Corpus Christi (16), Beaumont (20), Pharr (21), Laredo (22)	September 1–November 30	Oats 72
Ft. Worth (2), Wichita Falls (3), Abilene (8), Brownwood (23), Childress (25)	September 1–November 30	Tall Fescue 4.5 Western Wheatgrass 5.6 Cereal Rye 34

Table 4
Temporary Warm Season Seeding

Districts	Dates	Seed Mix and Rates (lb. PLS/acre)
All	May 1–August 31	Foxtail Millet 34

- 2.2. **Fertilizer.** Use fertilizer in conformance with Article 166.2., “Materials.”
- 2.3. **Vegetative Watering.** Use water that is clean and free of industrial wastes and other substances harmful to the growth of vegetation.
- 2.4. **Mulch.**
- 2.4.1. **Straw or Hay Mulch.** Use straw or hay mulch in conformance with Section 162.2.5., “Mulch.”
- 2.4.2. **Cellulose Fiber Mulch.** Use only cellulose fiber mulches that are on the Approved Products List, *Erosion Control Approved Products*. (<http://www.txdot.gov/business/resources/erosion-control.html>) Submit one full set of manufacturer’s literature for the selected material. Keep mulch dry until applied. Do not use molded or rotted material.
- 2.5. **Tacking Methods.** Use a tacking agent applied in accordance with the manufacturer’s recommendations or a crimping method on all straw or hay mulch operations. Use tacking agents as approved or as specified on the plans.

3. CONSTRUCTION

Cultivate the area to a depth of 4 in. before placing the seed unless otherwise directed. Use approved equipment to vertically track the seedbed as shown on the plans or as directed. Cultivate the seedbed to a depth of 4 in. or mow the area before placement of the permanent seed when performing permanent seeding after an established temporary seeding. Plant the seed specified and mulch, if required, after the area has been completed to lines and grades as shown on the plans.

- 3.1. **Broadcast Seeding.** Distribute the seed or seed mixture uniformly over the areas shown on the plans using hand or mechanical distribution or hydro-seeding on top of the soil unless otherwise directed. Apply the mixture to the area to be seeded within 30 min. of placement of components in the equipment when seed and water are to be distributed as a slurry during hydro-seeding. Roll the planted area with a light roller or other suitable equipment. Roll sloped areas along the contour of the slopes.

3.2. **Straw or Hay Mulch Seeding.** Plant seed according to Section 164.3.1., "Broadcast Seeding." Apply straw or hay mulch uniformly over the seeded area immediately after planting the seed or seed mixture. Apply straw mulch at 2 to 2.5 tons per acre. Apply hay mulch at 1.5 to 2 tons per acre. Use a tacking method over the mulched area.

3.3. **Cellulose Fiber Mulch Seeding.** Plant seed in accordance with Section 164.3.1., "Broadcast Seeding." Apply cellulose fiber mulch uniformly over the seeded area immediately after planting the seed or seed mixture at the following rates.

- Sandy soils with slopes of 3:1 or less—2,500 lb. per acre.
- Sandy soils with slopes greater than 3:1—3,000 lb. per acre.
- Clay soils with slopes of 3:1 or less—2,000 lb. per acre.
- Clay soils with slopes greater than 3:1—2,300 lb. per acre.

Cellulose fiber mulch rates are based on dry weight of mulch per acre. Mix cellulose fiber mulch and water to make a slurry and apply uniformly over the seeded area using suitable equipment.

3.4. **Drill Seeding.** Plant seed or seed mixture uniformly over the area shown on the plans at a depth of 1/4 to 1/3 in. using a pasture or rangeland type drill unless otherwise directed. Plant seed along the contour of the slopes.

3.5. **Straw or Hay Mulching.** Apply straw or hay mulch uniformly over the area as shown on the plans. Apply straw mulch at 2 to 2.5 tons per acre. Apply hay mulch at 1.5 to 2 tons per acre. Use a tacking method over the mulched area.

Apply fertilizer in conformance with Article 166.3., "Construction." Seed and fertilizer may be distributed simultaneously during "Broadcast Seeding" operations, provided each component is applied at the specified rate. Apply half of the required fertilizer during the temporary seeding operation and the other half during the permanent seeding operation when temporary and permanent seeding are both specified for the same area.

Water the seeded areas at the rates and frequencies as shown on the plans or as directed.

4. MEASUREMENT

This Item will be measured by the square yard or by the acre.

5. PAYMENT

The work performed and the materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Broadcast Seeding (Perm)" of the rural or urban seed mixture and sandy or clay soil specified, "Broadcast Seeding (Temp)" of warm or cool season specified, "Straw or Hay Mulch Seeding (Perm)" of the rural or urban seed mixture and sandy or clay soil specified, "Straw or Hay Mulch Seeding (Temp)" of warm or cool season specified, "Cellulose Fiber Mulch Seeding (Perm)" of the rural or urban seed mixture and sandy or clay soil specified, "Cellulose Fiber Mulch Seeding (Temp)" of warm or cool season specified, "Drill Seeding (Perm)" of the rural or urban seed mixture and sandy or clay soil specified, "Drill Seeding (Temp)" of warm or cool season specified, and "Straw or Hay Mulching." This price is full compensation for furnishing materials, including water for hydro-seeding and hydro-mulching operations, mowing, labor, equipment, tools, supplies, and incidentals. Fertilizer will not be paid for directly but will be subsidiary to this Item. Water for irrigating the seeded area, when specified, will be paid for under Item 168, "Vegetative Watering."