REQUEST FOR PROPOSAL

FOR

TSTC WATER & WASTEWATER LINE REPLACEMENT FOR WACO

TEXAS STATE TECHNICAL COLLEGE
RFP No.: RFP PG-005-17

SUBMITTAL DUE DATE:
Wednesday April 12, 2017 at 2:00 P.M. CST

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General Information

1.1 Purpose of the Request

Texas State Technical College (TSTC) ("Owner") is soliciting competitive sealed proposals ("Proposals") for TSTC Water and Wastewater Line Replacement on the TSTC Waco campus. ("Project"), in accordance with the terms, conditions, and requirements set forth in this Request for Proposals ("RFP"). This RFP and the Respondent's submission will be referenced and form part of the Contract Purchase Order issued to the successful Respondent.

1.2 Conflicts of Interest

Actual and Perceived Conflicts
By submitting a Proposal, Respondent represents and warrants that neither it nor its employees and subcontractors have an actual or potential conflict of interest in entering a contract with Owner. Respondent also represents and warrants that entering a contract with Owner will not create the appearance of impropriety. In its Proposal, respondent must disclose any existing or potential conflict of interest that it might have in contracting with Owner. The requirement to disclose any actual or potential conflict of interest will continue during the term of the contract, and will survive until the end of the recordkeeping requirements. The Owner will decide, in its sole discretion, whether an actual or perceived conflict should result in disqualification or contract termination.

Current and Former Employees
In addition to the disclosures required above, respondent must also disclose any of its personnel who are current or former officers or employees of the Owner or who are related, within the third degree of consanguinity (as defined by Texas Government Code 573.023) or within the second degree by affinity (as defined by Texas Government Code 573.025), to any current tor former officers or employees of the Owner.

Respondents must comply with all applicable Texas and federal laws and regulations relating to the hiring of former state employees. Such "revolving door" provisions generally restrict former agency heads from communicating with or appearing before the agency on certain matters for two years after leaving the agency. The revolving door provisions also restrict some former employees from representing clients on matters that the employee participated in during state service or matters that were in the employees' official responsibility. Respondent, by signing this solicitation, certifies that it has complied with all applicable laws and regulations regarding former state employees.

Respondent must identity each employee who works for more than one staffing company at any facility and ensure that the employee' cumulative weekly hours worked at all state facilities through any one staffing company does not exceed 40 hours per week.

1.3 Submission of Proposal

Pursuant to the provisions of Texas Government Code Title 10 Subtitle D Chapter 2156.121-2158.127, sealed proposals will be received until the date and time established for receipt. After, receipt, only the names of respondents will be made public. Prices and other proposal details will only be divulged after the contract award, if one is made.

TSTC will receive Proposals until Wednesday April 12, 2017 at 2:00 P.M. central standard time. Proposals must be time-stamped by TSTC before the hour and date specified. Proposals that are received late will be returned to the respondent unopened.

Proposals will not be received by telephone, fax, or email. Proposals will only be received at the location described below:

Pedro Guardiola
Texas State Technical College
Service Support Building
1902 N. Loop 499
Harlingen, Texas 78550

Submit one (1) original hard copy and one (1) identical electronic copy of the Proposal and all of its contents. The original Proposal should contain the mark "original" on the Proposal Cover Page. The electronic copy shall be submitted in a USB/Flash Drive or in a CD in the same envelope as the hard-copy original proposal. Proposer must include signatures on both hard copy and electronic copy.

Proposal must be enclosed in a sealed envelope (box or container) addressed as described above. The envelope must clearly identify the RFP number, submittal due date, and the name and return address of the respondent. Proposal and any other information submitted by respondents in response to this RFP shall become the property of the TSTC.

Failure to comply with all requirements contained in this RFP may result in the rejection of the Proposal that are qualified with conditional clauses, alterations, items not called for in the RFP, or irregularities of any kind are subject to rejection.

Properly submitted Proposals will be opened publicly and the names of the respondents will be read aloud. Proposal cannot be altered or amended after opening time. Proposal cannot be withdrawn after opening time without written approval by TSTC based on a written request to withdraw.

Late received Proposals will be returned to the respondent.

1.4 Key Events Schedule

Issuance of RFP	Tuesday, March 07, 2017
Mandatory Pre-proposal Walk-through **Texas State Technical College (Waco campus)** **Physical Plant (Conference Room)** **1200 Greenway Waco, Texas**	**Tuesday March 28, 2017, 10:00 AM**
Deadline for Submittal of Questions	**Thursday, March 30, 2017, 2:00 PM**
Submittal	**Wednesday, April 12, 2017, 2:00 PM**
Evaluation and Award (Tentative)	**April 12 through April 26, 2017**

1.5 Clarifications and Interpretations

All questions regarding this RFP must be submitted in writing to Pedro Guardiola of Procurement Operations, at pedro.guardiola@tstc.edu **no later than March 30, 2107 at 2:00 PM any clarifications or interpretations of this RFP that materially affect or change its requirements will be issued by TSTC**

as an addendum. Addendums can be viewed at http://esbd.cpa.state.tx.us/ or http://www.tstc.edu/procurement/home . All such addenda are issued by TSTC before the Proposals are due as part of the RFP and respondents shall acknowledge receipt of each addendum to the RFP in its Proposal.

Respondents obtaining this RFP are responsible for notifying TSTC that they are in receipt of this RFP and intend to respond. Please send the respondent's name, contact person, address, phone number, fax number, and email to Pedro Guardiola, Buyer I for Procurement Operations, at pedro.guardiola@tstc.edu. This information is required in the event addenda are issued. **It is the responsibility of all respondents to obtain addenda in a timely manner. Respondents shall acknowledge receipt of each addendum to the RFP in the Proposal.**

Upon issuance of the RFP, besides written inquiries as described above, other employees and representatives of TSTC will not answer questions or otherwise discuss the contents of the RFP with any potential consultant's representatives. Failure to observe this restriction may result in disqualification of any subsequent response. This restriction does not preclude discussions with TSTC for the purpose of conducting business unrelated to this RFP.

1.6 Evaluation Process

TSTC may select the Proposal that offers the "best value" for the institution based on the published selection criteria and on its ranking evaluation. TSTC may first attempt to negotiate a contract with the selected respondent. TSTC may discuss with the selected respondent options for a scope or time modification and any price change associated with the modification. If TSTC is unable to reach a contract with the selected respondent, TSTC may formally end negotiations with that respondent and proceed to the next "best value" respondent in the order of the selection ranking until a contract is reached or all Proposals are rejected. TSTC is not obligated to select the Respondent offering the most attractive economic terms if that Respondent is not the most advantageous to TSTC overall, as determined by TSTC.

1.7 Exceptions to RFP

The Respondent shall explicitly set forth in this section any assumptions regarding, or exceptions to, any part of this RFP, including the Attachments, noting the specific RFP section number or Attachment Letter. If there are no exceptions, the Respondent shall explicitly state that the Respondent takes no exception to any part of this RFP. **Any exception *may* result in this RFP not being awarded to the Respondent.**

1.8 Bidding Requirements

Proposal prices must be firm for TSTC acceptance for 90 days from the submittal due date and the RFP Document Submission shall be irrevocable from the close of the call until acceptance by TSTC or the passage of a period of 90 days, whichever shall occur first.

1.9 No Reimbursement for Costs

Respondent acknowledges and accepts that any costs incurred from Respondent's participation in this RFP process shall be at the sole risk and responsibility of the Respondent.

1.10 Taxes

TSTC is exempt from taxes pursuant to the provisions of the *Texas Tax Code*, Chapter 151. Do not include tax in the Proposal. Excise Tax Exemption Certificates are available upon request.

1.11 Reservation of Rights

TSTC may evaluate the Proposal based on the anticipated completion of all or any portion of the Project. TSTC reserves the right to divide the Project into multiple parts, to reject any and all Proposals and re-solicit for new Proposals, or to reject any and all Proposals and temporarily or permanently abandon the Project. TSTC makes no representations, written or oral, that it will enter into any form of agreement with any respondent to this RFP for any project and no such representation is intended or should be construed by the issuance of this RFP.

1.12 Texas Public Information Act

All information, documentation, and other materials submitted in response to this RFP are considered non-confidential and/or non-proprietary and are subject to public disclosure under the Texas Public Information Act (*Texas Government Code*, Chapter 552.001, *et seq.*) after the solicitation is completed. TSTC strictly complies with all statutes, court decisions, and opinions of the Texas Attorney General with respect to disclosure of public information.

1.13 Equal Opportunity

The Respondent must be an equal opportunity employer. No person shall be discriminated against in employment because of race, color, religion, gender, national origin, disability, or age.

1.14 Accuracy of Information

TSTC and its officers, directors, employees and agents assume no responsibility for the accuracy of the information in this document. Should dispute arise regarding the meaning or intent of the Contract Documents, the decision of the TSTC shall be final and binding upon the Contractor.

1.15 Invoices

Original invoices must be submitted monthly in connection with all payments. To be a proper invoice that may be accepted and paid, the invoice must include the following information and/or attachments; Name and address of the Respondent, Respondent's invoice remittance address, Purchase order number authorizing the services, and Detailed breakdown of monthly total price for services to include operating expense plus labor for man-hours worked including, as applicable, the time period, guard's individual hours, signed time sheets as supporting documentation, and any other related documentation to show proof of hours documented for payment. Invoices should be received no later than the (15) fifteenth day of every month. Each invoice is subject to review and approval by TSTC before payment will be processed. Normal payment processing time for services which have been completed, delivered to, and approved by TSTC is thirty (30) calendar days after receipt of a valid, uncontested invoice. TSTC will incur no penalty for late payment if payment is made in thirty (30) or fewer days from receipt of goods or services and an uncontested invoice. Payments shall be made consistent with Chapter 2251, Texas Government Code. Any invoice that does not comply with the minimum requirements stated above may not be considered valid and may be subject to rejection and/or return to the contractor. Invoices shall be submitted on approved AIA schedule of value and certified by the contractor and Engineer.

Invoices shall be submitted by mail to:
Texas State Technical College

Physical Plant (Attn: Rosie Smiley)
3801 Campus Drive
Waco, Texas 76705

1.16 Insurance

Contractor will obtain and maintain in force for the duration of the contract and any extensions thereof, at Contractor's sole expense, and to cause its agents, suppliers and permitted subcontractors (if any) to maintain at their sole expense the following insurance coverage for the duration of the contract, in at least the amounts specified:

Workers Compensation:	Statutory Limits	
General Liability:	Each occurrence	$1,000,000
	Personal Injury	$1,000,000
	General Aggregate	$2,000,000
	Product Liability	$1,000,000
	EBL	$1,000,000
Automobile Liability	Each Accident	$1,000,000
Umbrella Liability	Each Occurrence	$5,000,000
Professional Liability	Each Occurrence	$5,000,000
All other insurance required by state or federal law		

All policies (except Workers' Compensation) shall name TSTC as an Additional Insured. A Waiver of Subrogation in favor of TSTC and thirty (30) day notice of cancellation is required on all policies. Certificates of insurance verifying the foregoing requirements shall be provided to TSTC prior to commencement of any services under the contract. If a policy contains deductible provisions, Contractor shall be responsible for payment of the deductible amount for any claim(s) or the pursuit of any claim(s) or asserted claim(s) against TSTC, its agents, employees or representatives.

CONTRACTOR ACKNOWLEDGES AND UNDERSTANDS THAT TSTC DOES NOT MAINTAIN AND WILL NOT OBTAIN INSURANCE OF ANY TYPE TO PROTECT CONTRACTOR AGAINST ANY LOSS, DAMAGE OR INJURY THAT MAY IN ANY WAY RESULT FROM CONTRACTOR'S PERFORMANCE OF THE SERVICES.

1.17 Indemnification

THE CONTRACTOR FOR ITSELF, ITS SUCCESSORS, SERVANTS, EMPLOYEES, AGENTS, OFFICERS, DIRECTORS, SUBCONTRACTORS AND ASSIGNS SHALL AT ALL TIMES INDEMNIFY AND HOLD HARMLESS TSTC, ITS OFFICERS, DIRECTORS, SUCCESSORS, ASSIGNS, AGENTS, SERVANTS AND EMPLOYEES FROM ANY AND ALL CLAIMS, DEMANDS, CAUSES OF ACTION, DAMAGES, COSTS, EXPENSES, LEGAL FEES AND DISBURSEMENTS AND OBLIGATIONS OF ANY NATURE WHATSOEVER, KNOWN OR UNKNOWN, IN LAW OR IN EQUITY, WHETHER BASED UPON, OCCASIONED BY, ARISING OUT OF, OR ATTRIBUTABLE TO THE CONTRACTOR'S CONTRACT WITH TSTC OR ANY SERVICES PROVIDED, OR ANY PRIVILEGE GRANTED OR ACTION TAKEN OR THING DONE OR MAINTAINED BY VIRTUE OF THE EXISTENCE OF THE SAID CONTRACT OR THE EXERCISE OF ANY RIGHT ARISING THEREUNDER.

1.18 HISTORICALLY UNDERUTILIZED BUSINESSES SUBMITTAL REQUIREMENTS

It is the policy of Texas State Technical College to promote and encourage contracting and subcontracting

opportunities for Historically Underutilized Businesses (HUB) in all contracts. Accordingly, TSTC has adopted the State's policy on Utilization of Historically Underutilized Businesses. The Policy applies to all contracts with an expected value of $100,000 or more. If TSTC determines that subcontracting opportunities are probable, then a HUB Subcontracting Plan is a required element of the Qualifications and Proposal. Failure to submit a required HUB Subcontracting Plan will result in rejection of the Qualifications and Proposal.

1.18.1 Statement of Probability

Texas State Technical College, has determined that subcontracting opportunities are probable in connection with this procurement solicitation. Therefore, a HUB Subcontracting Plan (HSP) is required as a part of the respondent's Qualifications and Proposal. HUB plans should be submitted at the time of the RFP. A HUB Subcontracting Plan (**Included as a separate attachment**) must be filled out and returned with the Proposal to be considered responsive. **If the Proposal does not include a HUB Subcontracting Plan, it shall be rejected as a material failure to comply with advertised specifications. The HUB Subcontracting plan will need to be updated as subcontracts are awarded in the RFP process.**

1.19 Alternative Dispute Resolution

To the extent that Chapter 2260, *Texas Government Code*, as it may be amended from time to time ("Chapter 2260"), will be applicable to the Contract and is not preempted by other applicable law, the dispute resolution process provided for in Chapter 2260 shall be used, as further described herein, by TSTC and Contractor to attempt to resolve any claim for breach of contract made by Contractor.

1.20 Confidential Information

All information owned, possessed or used by TSTC that is communicated to, learned, developed or otherwise acquired by Contractor in the performance of services for TSTC, that is not generally known to the public, will be confidential and Contractor will not, beginning on the date of first association or communication between TSTC and Contractor and continuing throughout the term of the contract and any time thereafter, disclose, communicate or divulge, or permit disclosure, communication or divulgence, to another or use for Contractor's own benefit or the benefit of another, any confidential information, unless required by law.

Except when defined as part of the Services, Contractor will not make any press releases, public statements, or advertisement referring to the Services or the engagement of Contractor as an independent contractor of TSTC in connection with the Services, or release any information relative to the Services for publication, advertisement or any other purpose without the prior written approval of TSTC. Contractor will obtain assurances similar to those contained in this Section from persons, contractors, and subcontractors retained by Contractor.

1.21 Governing Law

The contract and all of the rights and obligations of the parties hereto and all of the terms and conditions hereof will be construed, interpreted and applied in accordance with and governed by and enforced under the laws of the State of Texas.

1.22 Licenses, Permits, Taxes, Fees, Laws and Regulations

Contractor warrants that it will obtain, maintain in effect, and pay the cost for all licenses, permits, or certifications that may be necessary for Contractor's performance of the contract.

Contractor will be responsible for the payment of all taxes, excises, fees, payroll deductions, employee benefits (if any), fines, penalties or other payments required by federal, state, or local law or regulation in connection with Contractor's performance of the contract.

Contractor will comply with, and will be responsible for requiring its officers and employees to comply with, all applicable federal, state, and local laws and regulations, and the rules and regulations of TSTC.

2. Scope of Services

2.1 Overview

Texas State Technical College (TSTC) ("Owner") is soliciting statements of proposals ("Proposals") for TSTC Water & Wastewater Line Replacement in Waco, Texas ("Project"), in accordance with the terms, conditions, and requirements set forth in this Request for Proposals ("RFP").

2.2 Contractor Responsibilities

The purpose of this Request for Proposals (RFP) is to engage a Proposer to furnish materials, labor, and equipment required to complete this project in accordance with the plans and specifications developed by Walker Partners, LLC

2.3 Documentation

Monitoring the performance of service will be completed based upon contract negotiations.

2.4 Contract Administration

Rosie Smiley will be the Contract Manager for this project.

2.5 Change or Addition to Scope of Services

TSTC, without invalidating the contract, may make changes by altering, adding to, or deduction from the Scope of Services at any time during the term of the contract in order to meet current TSTC needs. The Contract pricing shall be adjusted accordingly, upon mutual agreement between TSTC and Contractor. Should TSTC request additional services during the term of the Contract, an agreement to provide these services at the same price as quoted will be understood as included in the Respondent's submission.

3. Proposal Format

3.1 Cover Page

The Proposal Cover Page, Attachment A, should be the first page of your Proposal. The Proposal Cover Page must be signed by a person authorized to sign for Respondent.

3.2 Execution of Offer

The Execution of Offer Pages, Attachment B, should be the second page of your Proposal. **The Execution of Offer must be signed by a person authorized to sign for Respondent and submitted with RFP.**

3.3 Table of Contents

A Table of Contents should be the third page of your Proposal. The Table of Contents shall give page numbers for each section of the Proposal. Number all pages of the Proposal sequentially using Arabic numerals (1, 2, 3, etc.).

3.4 Proposal Contents

Responses to this RFP must address the following:

The proposal should be no more than 20 (twenty) 8 1/2" x 11" typed pages. The Cover Page, Execution of Offer, Table of Contents and Cover Letter will not be counted in the twenty page limit. The proposal should clearly set forth:

1) the proposer's organizational and financial stability and ability to perform, 2) the proposer's experience on similar projects, 3) the proposer's experience with and knowledge of local conditions related to construction of this project, 4) the proposer's recent, within the past 5 years, references from similar completed projects.

Insurance
Proposer will provide proof of insurance within 10 days of award. Proposer not providing or meeting TSTC's minimum requirements will not be included for consideration of the award of the project.

References

a. Provide information required on the following tables:

TABLE 1 – GENERAL INFORMATION	Open Cut		Prime or Sub (circle one)	
A. COMPANY DATA				
Organization Doing Business:				
Business Address:				
Telephone Number:				
Fax Number:				
Form of Business:	Corporation	Partnership	Individual	Joint Venture
IF A CORPORATION				
Date of Incorporation:				
State Incorporated:				
President's Name:				
Vice President's Name:				
IF A PARTNERSHIP				
Date of Organization:				
Type	General		Limited	
IF AN INDIVIDUAL				
Name:				
Business Address:				
IF A JOINT VENTURE				
Name of Manager:				
Name of Firm:				
Name of Individual Companies:				
B. BUSINESS INFORMATION				
Current Number of Full Time Employees:		Past Year's Revenues:		
Average Number of Projects Annually:		Average Construction Cost of Project:		
C. DIVISION OF WORK BETWEEN CONTRACTOR AND SUBCONTRACTORS				
1. List work that will be provided by Proposer (Prime Contractor) using its own resources.				
2. List work that will be provided by Subcontractors on this project.				

TABLE 1 – GENERAL INFORMATION	Trenchless		Prime or Sub (circle one)	
A. COMPANY DATA				
Organization Doing Business:				
Business Address:				
Telephone Number:				
Fax Number:				
Form of Business:	Corporation	Partnership	Individual	Joint Venture
IF A CORPORATION				
Date of Incorporation:				
State Incorporated:				
President's Name:				
Vice President's Name:				
IF A PARTNERSHIP				
Date of Organization:				
Type	General		Limited	
IF AN INDIVIDUAL				
Name:				
Business Address:				
IF A JOINT VENTURE				
Name of Manager:				
Name of Firm:				
Name of Individual Companies:				
B. BUSINESS INFORMATION				
Current Number of Full Time Employees:		Past Year's Revenues:		
Average Number of Projects Annually:		Average Construction Cost of Project:		
C. DIVISION OF WORK BETWEEN CONTRACTOR AND SUBCONTRACTORS				
1. List work that will be provided by Proposer (Prime Contractor) using its own resources.				
2. List work that will be provided by Subcontractors on this project.				

TABLE 2 – CONSTRUCTION EXPERIENCE			Open Cut
1. Years of experience on open cut water and wastewater projects:			
As a General Contractor:		Number of Total Projects:	
2. Number of open cut water and wastewater projects completed in McLennan County in the past five (5) years?			
3. Has this or a predecessor company ever defaulted on a project or failed to complete work award to it?			
4. Has this or a predecessor company ever been released from a bid or proposal in the past ten (10) years?			
5. Has this or a predecessor company ever been disqualified as a bidder or proposer on any project within the last five (5) years?			
6. Is offering company currently involved in any litigation or contemplating any litigation?			
7. Has this or a predecessor company ever refused to construct of refused to provide materials defined in Contract Documents on a project?			
8. Are there any liens currently filed against the proposer by either subcontractor or material suppliers on previous projects?			

TABLE 2 – CONSTRUCTION EXPERIENCE			Trenchless
1. Years of experience on trenchless water and wastewater projects:			
As a General Contractor:		Number of Total Projects:	
2. Has contractor been actively engaged in the installation of pipe using the static pipe bursting method for a minimum of five (5) years in the state of Texas?			
3. Has contractor performed a minimum of 25,000 LF of completed pipe bursting footage typically in the 2”-12” range for IPBA Class A, B, C replacements?			
4. Has this or a predecessor company ever defaulted on a project or failed to complete work award to it?			
5. Has this or a predecessor company ever been released from a bid or proposal in the past ten (10) years?			
6. Has this or a predecessor company ever been disqualified as a bidder or proposer on any project within the last five (5) years?			
7. Is offering company currently involved in any litigation or contemplating any litigation?			
8. Has this or a predecessor company ever refused to construct of refused to provide materials defined in Contract Documents on a project?			
9. Are there any liens currently filed against the proposer by either subcontractor or material suppliers on previous projects?			

TABLE 3 – SIMILAR PROJECTS COMPLETED WITHIN LAST 5 YEARS				Open Cut
REFERENCE PROJECT 1				
Project Description				
Owner	Project Name	Contract Amount	Date Completed	% Change Orders
Owner's Reference Information				
Name	Title	Organization	Telephone	E-Mail
Engineer's Reference Information				
Name	Title	Company	Telephone	E-Mail
REFERENCE PROJECT 2				
Project Description				
Owner	Project Name	Contract Amount	Date Completed	% Change Orders
Owner's Reference Information				
Name	Title	Organization	Telephone	E-Mail
Engineer's Reference Information				
Name	Title	Company	Telephone	E-Mail
REFERENCE PROJECT 3				
Project Description				
Owner	Project Name	Contract Amount	Date Completed	% Change Orders
Owner's Reference Information				
Name	Title	Organization	Telephone	E-Mail
Engineer's Reference Information				
Name	Title	Company	Telephone	E-Mail

TABLE 3 – SIMILAR PROJECTS COMPLETED WITHIN LAST 5 YEARS				Trenchless
REFERENCE PROJECT 1				
Project Description				
Owner	Project Name	Contract Amount	Date Completed	% Change Orders
Owner's Reference Information				
Name	Title	Organization	Telephone	E-Mail
Engineer's Reference Information				
Name	Title	Company	Telephone	E-Mail
REFERENCE PROJECT 2				
Project Description				
Owner	Project Name	Contract Amount	Date Completed	% Change Orders
Owner's Reference Information				
Name	Title	Organization	Telephone	E-Mail
Engineer's Reference Information				
Name	Title	Company	Telephone	E-Mail
REFERENCE PROJECT 3				
Project Description				
Owner	Project Name	Contract Amount	Date Completed	% Change Orders
Owner's Reference Information				
Name	Title	Organization	Telephone	E-Mail
Engineer's Reference Information				
Name	Title	Company	Telephone	E-Mail

TABLE 4 – PROPOSED KEY PERSONNEL	Open Cut
PROJECT MANAGER	
Name of Project Manager	
Years of Experience as PM	
Number of Similar Projects as PM with this company	
Number of Similar Projects with other companies (PM)	
Current Assignments	
% of time dedicated to this project	
PROJECT SUPERINTENDENT	
Name of Superintendent	
Years of Experience as Superintendent	
Number of Similar Projects as Super with this company	
Number of Similar Project with other companies (Super)	
Current Assignments	
% of time dedicated to this project	

TABLE 4 – PROPOSED KEY PERSONNEL	Trenchless
PROJECT MANAGER	
Name of Project Manager	
Years of Experience as PM	
Number of Similar Projects as PM with this company	
Number of Similar Projects with other companies (PM)	
Current Assignments	
% of time dedicated to this project	
PROJECT SUPERINTENDENT	
Name of Superintendent	
Is Superintendent certified in writing by manufacturer of the pipe bursting system as having successfully completed training?	
Does Superintendent have a minimum 3 years of field installation experience operating and maintaining all pipe bursting equipment to be used?	
Years of Experience as Superintendent	
Number of Similar Projects as Super with this company	
Number of Similar Project with other companies (Super)	
Current Assignments	
% of time dedicated to this project	

b. Describe your firm's past performance on other contracts for any of the Texas State Technical College locations.

4. Proposal Selection Criteria

The evaluation of the Proposals shall be based upon the requirements described in the RFP. All the properly submitted Proposals will be reviewed, evaluated, and ranked by the Owner.

An evaluation team from TSTC will evaluate the Proposal. The evaluation of Proposal and the selection of a respondent will be based on the information provided by Respondent in its Proposal. TSTC may give consideration to additional information if TSTC deems such information relevant.

The criteria to be considered by TSTC in evaluating Proposal and selecting a Contractor will be those factors listed below:

Threshold Criteria Not Scored:

- Ability of TSTC to comply with laws regarding Historically Underutilized Businesses; and
- Ability of TSTC to comply with laws regarding purchases from persons with disabilities.

	Scored Criteria:	**Points:**
1.	Financial and Organizational stability and ability to perform	10
2.	Project teams' experience including sub consultants on similar projects	15
3.	Knowledge and experience with local conditions related to construction	20
4.	References from previous projects	15
5.	Cost of the Work	40
	Total	**100**

5. Attachments for this RFP

Attachment A – Proposal Cover Page
Attachment B – Execution of Offer **(Must be submitted with Proposal)**
Attachment C – Terms & Conditions
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Attachment A - Proposal Cover Page

TEXAS STATE TECHNICAL COLLEGE
TSTC WATER & WASTEWATER LINE REPLACEMENT
FOR WACO
RFP No.: RFP PG-005-17

FIRM NAME: _____

ADDRESS: _____

CITY, STATE, ZIP _____

TELEPHONE: _____ FAX: _____

E-MAIL: _____

FEDERAL EMPLOYER ID #:_____ or SS # (if sole owner): _____

TEXAS CHARTER # IF APPLICABLE: _____

IS YOUR COMPANY A HUB VENDOR? _____ WHAT CATEGORY? _____

Attachment B – Execution of Offer

TEXAS STATE TECHNICAL COLLEGE
TSTC WATER & WASTEWATER LINE REPLACEMENT
FOR WACO
RFP No.: RFP PG-005-17

NOTE TO RESPONDENTS: SUBMIT ENTIRE SECTION WITH RESPONSE.

THIS EXECUTION OF OFFER MUST BE COMPLETED, SIGNED, AND RETURNED WITH THE RESPONDENT'S PROPOSAL. FAILURE TO COMPLETE, SIGN AND RETURN THIS EXECUTION OF OFFER WITH THE PROPOSAL MAY RESULT IN REJECTION OF THE PROPOSAL.

SIGNING A FALSE STATEMENT MAY VOID THE SUBMITTED PROPOSAL OR ANY AGREEMENTS OR OTHER CONTRACTUAL ARRANGEMENTS, WHICH MAY RESULT FROM THE SUBMISSION OF RESPONDENT'S PROPOSAL, AND THE RESPONDENT MAY BE REMOVED FROM ALL PROPOSER LISTS. A FALSE CERTIFICATION SHALL BE DEEMED A MATERIAL BREACH OF CONTRACT AND, AT OWNER'S OPTION, MAY RESULT IN TERMINATION OF ANY RESULTING CONTRACT OR PURCHASE ORDER.

A. By signature hereon, Respondent acknowledges and agrees that (1) this RFP is a solicitation for Proposals and is not a contract or an offer to contract; (2) the submission of Proposals by Respondent in response to this RFP will not create a contract between the Owner and Respondent; (3) the Owner has made no representation or warranty, written or oral, that one or more contracts with the Owner will be awarded under this RFP; and (4) Respondent shall bear, as its sole risk and responsibility, any cost which arises from Respondent's preparation of a response to this RFP.

B. By signature hereon, Respondent offers and agrees to furnish to the Owner the products and/or services more particularly described in its Proposals, and to comply with all terms, conditions and requirements set forth in the RFP documents and contained herein.

C. By signature hereon, Respondent affirms that he has not given, nor intends to give at any time hereafter, any economic opportunity, future employment, gift, loan, gratuity, special discount, trip, favor or service to a public servant in connection with the submitted Proposal.

D. By signature hereon, a corporate Respondent certifies that it is not currently delinquent in the payment of any Franchise Taxes due under Chapter 171, Texas Tax Code, or that the corporate Respondent is exempt from the payment of such taxes, or that the corporate Respondent is an out-of-state corporation that is not subject to the Texas Franchise Tax, whichever is applicable.

E. By signature hereon, the Respondent hereby certifies that neither the Respondent nor the firm, corporation, partnership or Owner represented by the Respondent, or anyone acting for such firm, corporation, or institution has violated the antitrust laws of this state, codified in Section 15.01, et. seq., Texas Business and Commerce Code, or the Federal antitrust laws, nor communicated directly or indirectly the Qualifications made to any competitor or any other person engaged in such line of business.

F. By signature hereon, Respondent represents and warrants that:

1. Respondent is a reputable company regularly engaged in providing products and/or services necessary to meet the terms, conditions and requirements of the RFP;

2. Respondent has the necessary experience, knowledge, abilities, skills, and resources to satisfactorily perform the terms, conditions and requirements of the RFP;

3. Respondent is aware of, is fully informed about, and is in full compliance with all applicable federal, state and local laws, rules, regulations and ordinances;

4. Respondent understands (i) the requirements and specifications set forth in this RFP and (ii) the terms and conditions set forth in the Contract under which Respondent will be required to operate;

5. Respondent, if selected by the Owner, will maintain insurance as required by the Contract;

6. All statements, information and representations prepared and submitted in response to this RFP are current, complete, true and accurate. Respondent acknowledges that the Owner will rely on such statements, information and representations in selecting the successful Respondent. If selected by the Owner as the successful Respondent, Respondent will notify the Owner immediately of any material change in any matters with regard to which Respondent has made a statement or representation or provided information.

G. By signature hereon, Respondent certifies that the individual signing this document and the documents made part of the RFP is authorized to sign such documents on behalf of the company and to bind the company under any agreements or other contractual arrangements, which may result from the submission of Respondent's Proposal.

H. By signature hereon, Respondent certifies that if a Texas address is shown as the address of the Respondent, Respondent qualifies as a Texas Resident Respondent as defined in Rule 1 TAC 111.2.

I. By signature hereon, Respondent certifies as follows:

1. "Under Section 231.006, Texas Family Code, the vendor or applicant certifies that the individual or business entity named in this contract, RFP, or application is not ineligible to receive the specified grant, loan, or payment and acknowledges that this contract may be terminated and payment may be withheld if this certification is inaccurate."

2. "Under Section 2155.004, *Texas Government Code*, the vendor or applicant certifies that the individual or business entity named in this RFP or contract is not ineligible to receive the specified contract and acknowledges that this contract may be terminated and payment withheld if this certification is inaccurate."

3. "Under Section 2254.004, *Texas Government Code*, the vendor or applicant certifies that each individual or business entity which is an engineer or Engineer proposed by Respondent as a member of its team was selected based on demonstrated competence and qualifications only."

J. By signature hereon, Respondent certifies that no relationship, whether by relative, business associate, capital funding agreement or by any other such kinship exist between Respondent and an employee of any Texas State Technical College component, or Respondent has not been an employee of any Texas State Technical College component within the immediate twelve (12) months prior to your RFP

response. All such disclosures will be subject to administrative review and approval prior to the Owner entering into any contract with Respondent.

K. By signature hereon, Respondent affirms that no compensation has been received for participation in the preparation of the specifications for this RFP. (ref. Section 2155.004 Texas Government Code).

L. Respondent represents and warrants that all articles and services quoted in response to this RFP meet or exceed the safety standards established and promulgated under the Federal Occupational Safety and Health Law (Public Law 91-596) and its regulations in effect or proposed as of the date of this solicitation.

M. By signature hereon, Respondent signifies his compliance with all federal laws and regulations pertaining to Equal Employment Opportunities and Affirmative Action.

N. By signature hereon, Respondent agrees to defend, indemnify, and hold harmless the State of Texas, all of its officers, agents and employees from and against all claims, actions, suits, demands, proceedings, costs, damages, and liabilities, arising out of, connected with, or resulting from any acts or omissions of Respondent or any agent, employee, subcontractor, or supplier of Respondent in the execution or performance of any agreements or other contractual arrangements which may result from the submission of Respondent's Proposal.

O. By signature hereon, Respondent agrees that any payments that may become due under any agreements or other contractual arrangements, which may result from the submission of Respondent's Proposal, will be applied towards any debt including, but not limited to, delinquent taxes and child support that is owed to the State of Texas.

P. By signature hereon, Respondent certifies that no member of the Board of Regents of Texas State Technical College, or the Executive Officers of Texas State Technical College or its component institutions, has a financial interest, directly or indirectly, in the transaction that is the subject of the contract.

Execution of Offer: RFP No. RFP PG-005-17
TSTC WATER & WASTEWATER LINE REPLACEMENT
FOR WACO

The Respondent must complete, sign and return this Execution of Offer as part of their submittal response. The Respondent's company official(s) who are authorized to commit to such a submittal must sign submittals. Failure to sign and return this form will subject the submittal to disqualification.

The undersigned, having carefully examined the specifications, drawings, and related documents entitled:

TSTC Water & Wastewater Line Replacement

all as prepared by Walker Partners, LLC. 600 W. Austin Ave. Waco, Texas 76701 as well as all other conditions affecting the cost and/or execution of the work, proposes to furnish all materials, labor, and equipment necessary to complete the work in accordance with said documents, of which this proposal is a part, for the following sum:

ITEM NO.	DESCRIPTION	EST QTY	UNIT	UNIT BID PRICE	TOTAL AMOUNT
	BASE BID				
1.00	**GENERAL CONDITIONS**				
1.01	MOBILIZATION, TRAFFIC HANDLING, AND INCIDENTALS	1	LS		
1.02	CONTIGENCY ALLOWANCE	1	LS	$100,000.00	$100,000.00
1.03	PREPARE RIGHT-OF-WAY	1	LS		
1.04	STORMWATER POLLUTION PREVENTION PLAN	1	LS		
1.05	STORMWATER POLLUTION PREVENTION IMPLEMENTATION	1	LS		
1.06	TRENCH SAFETY PLAN	1	LS		
1.07	TRENCH SAFETY SYSTEM IMPLEMENTATION	19460	LF		
1.08	CLASS A SURFACE REPLACEMENT	3675	LF		
1.09	CLASS B SURFACE REPLACEMENT	9706	LF		
1.10	CLASS C SURFACE REPLACEMENT	243	LF		
1.11	REMOVE & REPLACE EXISTING CURB & GUTTER	211	LF		
1.12	SAW CUT CONCRETE CHANNEL & REPLACE	67	LF		

1.13	REMOVE & REPLACE EXISTING SIDEWALK (OPEN CUT)	175	LF	_____	_____
1.14	REMOVE AND REPLACE ALL DISTURBED AREAS TO INCLUDE: SIDEWALK, PAVERS, SODDING, LANDSCAPING, IRRIGATION, ELECTRICAL, AND ANY OTHER ITEMS SPOILED DURING TRENCHLESS CONSTRUCTION	1	LS	_____	_____
1.15	REMOVE & REPLACE CHAINLINK FENCE	60	LF	_____	_____
1.16	BROADCAST SEEDING	7655	LF	_____	_____
1.17	SOIL RETENTION BLANKET	958	SF	_____	_____
1.18	STONE RIPRAP (DRY; 15") INCLUDING WOVEN FILTER FABRIC, COMPLETE IN PLACE	61	CY	_____	_____
	GENERAL CONDITIONS SUBTOTAL				_____
2.00	**OPEN CUT WATER**			_____	_____
2.01	16" C-905 PVC (ALL DEPTHS) INCLUDING EXCAVATION & ALL BACKFILL (OFF STREET TRENCH)	53	LF	_____	_____
2.02	16" C-905 PVC (ALL DEPTHS) INCLUDING EXCAVATION & ALL BACKFILL (STREET TRENCH)	52	LF	_____	_____
2.03	12" C-900 PVC (ALL DEPTHS) INCLUDING EXCAVATION & ALL BACKFILL (OFF STREET TRENCH)	2390	LF	_____	_____
2.04	12" C-900 PVC (ALL DEPTHS) INCLUDING EXCAVATION & ALL BACKFILL (STREET TRENCH)	5328	LF	_____	_____
2.05	8" C-900 PVC (ALL DEPTHS) INCLUDING EXCAVATION & ALL BACKFILL (OFF STREET TRENCH)	741	LF	_____	_____
2.06	8" C-900 PVC (ALL DEPTHS) INCLUDING EXCAVATION & ALL BACKFILL (STREET TRENCH)	2147	LF	_____	_____
2.07	6" C-900 PVC (ALL DEPTHS) INCLUDING EXCAVATION & ALL BACKFILL (OFF STREET TRENCH)	197	LF	_____	_____
2.08	6" C-900 PVC (ALL DEPTHS) INCLUDING EXCAVATION & ALL BACKFILL (STREET TRENCH)	54	LF	_____	_____
2.09	EXTRA LENGTH 2" HDPE SERVICE LINE OVER 5FT LENGTH (ALL DEPTHS) (STREET TRENCH)	982	LF	_____	_____
2.10	EXTRA LENGTH 2" HDPE SERVICE LINE OVER 5FT LENGTH (ALL DEPTHS) (OFF STREET TRENCH)	2022	LF	_____	_____
2.11	8" METER AND VAULT INCLUDING VALVES, CONCRETE VAULT AND HATCH, PIPING, FITTINGS, COMPLETE AND IN PLACE	1	EA	_____	_____
2.12	8" REDUCED PRESSURE DETECTOR ASSEMBLY (RPDA) INCLUDING VALVES, CONCRETE PAD, PIPING, FITTINGS, ALUMINUM ENCLOSURE, COMPLETE AND IN PLACE	1	EA	_____	_____
2.13	16" X 16" TEE DI, MJ	1	EA	_____	_____
2.14	12" X 12" TEE DI, MJ	4	EA	_____	_____

2.15	12" X 8" TEE DI, MJ	3	EA	_____	_____
2.16	12" X 6" TEE DI, MJ	3	EA	_____	_____
2.17	8" X 8" TEE DI, MJ	2	EA	_____	_____
2.18	8" X 6" TEE DI, MJ	2	EA	_____	_____
2.19	12" X 12" CROSS DI, MJ	2	EA	_____	_____
2.20	16" GATE VALVE	1	EA	_____	_____
2.21	12" GATE VALVE	19	EA	_____	_____
2.22	8" GATE VALVE	17	EA	_____	_____
2.23	6" GATE VALVE	4	EA	_____	_____
2.24	16" DI, MJ 90º BEND	2	EA	_____	_____
2.25	12" DI, MJ 11 1/4º BEND	1	EA	_____	_____
2.26	12" DI, MJ 22 1/2º BEND	2	EA	_____	_____
2.27	12" DI, MJ 45º BEND	41	EA	_____	_____
2.28	12" DI, MJ 90º BEND	2	EA	_____	_____
2.29	8" DI, MJ 11.25º BEND	2	EA	_____	_____
2.30	8" DI, MJ 22.5º BEND	1	EA	_____	_____
2.31	8" DI, MJ 45º BEND	8	EA	_____	_____
2.32	8" DI, MJ 90º BEND	1	EA	_____	_____
2.33	16" X 12" REDUCER	1	EA	_____	_____
2.34	12" X 10" REDUCER	1	EA	_____	_____
2.35	12" X 8" REDUCER	6	EA	_____	_____
2.36	PLUG EXISTING 12" WATERLINE	2	EA	_____	_____
2.37	PLUG EXISTING 10" WATERLINE	4	EA	_____	_____

2.38	PLUG EXISTING 8" WATERLINE	23	EA	_____	_____
2.39	PLUG EXISTING 6" WATERLINE	13	EA	_____	_____
2.40	PLUG EXISTING 4" WATERLINE	19	EA	_____	_____
2.41	PLUG EXISTING 2.5" WATERLINE	2	EA	_____	_____
2.42	PLUG EXISTING 2" WATERLINE	7	EA	_____	_____
2.43	PLUG EXISTING 1.5" WATERLINE	2	EA	_____	_____
2.44	PLUG EXISTING 4" WASTEWATER LINE	2	EA	_____	_____
2.45	PLUG EXISTING 8" WASTEWATER LINE	8	EA	_____	_____
2.46	PLUG EXISTING 10" WASTEWATER LINE	2	EA	_____	_____
2.47	FIRE HYDRANT ASSEMBLY	19	EA	_____	_____
2.48	FIRE HYDRANT ASSEMBLY REMOVAL	46	EA	_____	_____
2.49	2" WATER SERVICE TO PRIVATE FACILITY	26	EA	_____	_____
2.50	4" WATER SERVICE TO PRIVATE FACILITY	1	EA	_____	_____
2.51	12" CAP	1	EA	_____	_____
2.52	8" CAP	4	EA	_____	_____
2.53	6" CAP	2	EA	_____	_____
2.54	16" FIELD CONNECTION	1	EA	_____	_____
2.55	12" FIELD CONNECTION	2	EA	_____	_____
2.56	10" FIELD CONNECTION	1	EA	_____	_____
2.57	TEMP. 10" FIELD CONNECTION	8	EA	_____	_____
2.58	8" FIELD CONNECTION	5	EA	_____	_____
2.59	TEMP. 8" FIELD CONNECTION	2	EA	_____	_____
2.60	6" FIELD CONNECTION	5	EA	_____	_____

2.61	TEMP. 6" FIELD CONNECTION	3	EA	_____	_____
2.62	2" FIELD CONNECTION	4	EA	_____	_____
2.63	CONCRETE ENCASEMENT	77	LF	_____	_____
	OPEN CUT WATER SUBTOTAL				_____
3.00	**OPEN CUT WASTEWATER**				
3.01	6" SDR-26 PVC ASTM-3034 (0'-5' TRENCH) INCLUDING EXCAVATION & ALL BACKFILL (STREET TRENCH)	91	LF	_____	_____
3.02	6" SDR-26 PVC ASTM-3034 (0'-5' TRENCH) INCLUDING EXCAVATION & ALL BACKFILL (OFF STREET TRENCH)	52	LF	_____	_____
3.03	8" SDR-26 PVC ASTM-3034 (+5'-10' TRENCH) INCLUDING EXCAVATION & ALL BACKFILL (STREET TRENCH)	1444	LF	_____	_____
3.04	8" SDR-26 PVC ASTM-3034 (+5'-10' TRENCH) INCLUDING EXCAVATION & ALL BACKFILL (OFF STREET TRENCH)	182	LF	_____	_____
3.05	8" SDR-26 PVC ASTM-3034 (+10'-15' TRENCH) INCLUDING EXCAVATION & ALL BACKFILL (OFF STREET TRENCH)	154	LF	_____	_____
3.06	12" SDR-26 PVC ASTM-3034 (+5'-10' TRENCH) INCLUDING EXCAVATION & ALL BACKFILL (STREET TRENCH)	2418	LF	_____	_____
3.07	12" SDR-26 PVC ASTM-3034 (+5'-10' TRENCH) INCLUDING EXCAVATION & ALL BACKFILL (OFF STREET TRENCH)	961	LF	_____	_____
3.08	12" SDR-26 PVC ASTM-3034 (+10'-15' TRENCH) INCLUDING EXCAVATION & ALL BACKFILL (OFF STREET TRENCH)	47	LF	_____	_____
3.09	18" F679 PS 46 (+5'-10' TRENCH) INCLUDING EXCAVATION & ALL BACKFILL (STREET TRENCH)	30	LF	_____	_____
3.10	18" F679 PS 46 (+5'-10' TRENCH) INCLUDING EXCAVATION & ALL BACKFILL (OFF STREET TRENCH)	200	LF	_____	_____
3.11	21" F679 PS 46 (+5'-10' TRENCH) INCLUDING EXCAVATION & ALL BACKFILL (STREET TRENCH)	193	LF	_____	_____
3.12	21" F679 PS 46 (+5'-10' TRENCH) INCLUDING EXCAVATION & ALL BACKFILL (OFF STREET TRENCH)	711	LF	_____	_____
3.13	4' DIAMETER MANHOLE (0'- 5' DEEP) WITH STANDARD COVER	21	EA	_____	_____
3.14	6' DIAMETER MANHOLE (0'- 5' DEEP) WITH STANDARD COVER	5	EA	_____	_____
3.15	4' DIAMETER MANHOLE (0'-5' DEEP) WITH WATERTIGHT COVER	1	EA	_____	_____
3.16	6' DIAMETER MANHOLE (0'-5' DEEP) WITH WATERTIGHT COVER	1	EA	_____	_____
3.17	6' DIAMETER MANHOLE (0'-5' DEEP) WITH "DOGHOUSE OPENING AND WATERTIGHT COVER	1	EA	_____	_____
3.18	EXTRA DEPTH FOR 4' DIAMETER MANHOLE OVER 5' DEEP	64	VF	_____	_____

3.19	EXTRA DEPTH FOR 6' DIAMETER MANHOLE OVER 5' DEEP	14	VF	_____	_____
3.20	CONNECT EX. 6" SEWER TO PROP. MANHOLE	2	EA	_____	_____
3.21	CONNECT EX. 8" SEWER TO PROP. MANHOLE	10	EA	_____	_____
3.22	CONNECT EX. 10" SEWER TO PROP. MANHOLE	2	EA	_____	_____
3.23	CONNECT EX. 15" SEWER TO PROP. MANHOLE	1	EA	_____	_____
3.24	CONNECT EX. 18" SEWER TO PROP. MANHOLE	4	EA	_____	_____
3.25	8" EXTERNAL DROP FIXTURE	2	EA	_____	_____
3.26	REMOVE EXISTING SANITARY SEWER MANHOLE	4	EA	_____	_____
3.27	ABANDON EXISTING SANITARY SEWER MANHOLE	29	EA	_____	_____
3.28	6" SANITARY SEWER SERVICE WITH 2-WAY CLEANOUT AND CONNECT TO COMMERCIAL SERVICE	6	EA	_____	_____
3.29	CONCRETE ENCASEMENT	94	LF	_____	_____
3.30	10' X 10' CONCRETE MANHOLE SLAB	2	EA	_____	_____
3.31	PLUG 6" SANITARY SEWER LINE	4	EA	_____	_____
3.32	PLUG 8" SANITARY SEWER LINE	20	EA	_____	_____
3.33	PLUG 10" SANITARY SEWER LINE	2	EA	_____	_____
3.34	PLUG 18" SANITARY SEWER LINE	4	EA	_____	_____
	OPEN CUT WASTEWATER SUBTOTAL				_____

4.00 TRENCHLESS WATER

4.01	8" DR 11 HDPE (BY OPEN CUT)	53	LF	_____	_____
4.02	6" DR 11 HDPE BY PIPE BURSTING EXISTING 6" CI/DI (ALL DEPTHS)	49	LF	_____	_____
4.03	8" DR 11 HDPE BY PIPE BURSTING EXISTING 6" CI/DI (ALL DEPTHS)	2431	LF	_____	_____
4.04	8" DR 11 HDPE BY PIPE BURSTING EXISTING 10" CI/DI (ALL DEPTHS)	6633	LF	_____	_____
4.05	12" DR 11 HDPE BY PIPE BURSTING EXISTING 8" CI/DI (ALL DEPTHS)	1468	LF	_____	_____

4.06	12" DR 11 HDPE BY PIPE BURSTING EXISTING 10" CI/DI (ALL DEPTHS)	3461	LF	_____	_____
4.07	8" END OF LINE BLOW OFF ASSEMBLY	1	EA	_____	_____
4.08	12" X 10" TEE DI, MJ	1	EA	_____	_____
4.09	12" X 8" TEE DI, MJ	2	EA	_____	_____
4.10	12" X 6" TEE DI, MJ	3	EA	_____	_____
4.11	12" X 4" TEE, DI, MJ	2	EA	_____	_____
4.12	8" X 8" TEE DI, MJ	9	EA	_____	_____
4.13	8" X 6" TEE DI, MJ	7	EA	_____	_____
4.14	12" X 12" CROSS DI, MJ	1	EA	_____	_____
4.15	12" GATE VALVE	5	EA	_____	_____
4.16	8" GATE VALVE	18	EA	_____	_____
4.17	6" GATE VALVE	9	EA	_____	_____
4.18	8" DI, MJ 11 1/4º BEND	1	EA	_____	_____
4.19	8" DI, MJ 90º BEND	7	EA	_____	_____
4.20	8" X 6" REDUCER DI, MJ	2	EA	_____	_____
4.21	10" X 8" REDUCER DI, MJ	4	EA	_____	_____
4.22	12" X 8" REDUCER DI, MJ	2	EA	_____	_____
4.23	PLUG EXISTING 12" WATERLINE	3	EA	_____	_____
4.24	PLUG EXISTING 10" WATERLINE	6	EA	_____	_____
4.25	PLUG EXISTING 8" WATERLINE	10	EA	_____	_____
4.26	PLUG EXISTING 6" WATERLINE	6	EA	_____	_____
4.27	PLUG EXISTING 3" WATERLINE	1	EA	_____	_____
4.28	PLUG EXISTING 1.5" WATERLINE	1	EA	_____	_____

4.29	PLUG EXISTING 8" WASTEWATER LINE	1	EA	_____	_____
4.30	6" CAP DI, MJ	2	EA	_____	_____
4.31	10" CAP DI, MJ	1	EA	_____	_____
4.32	FIRE HYDRANT ASSEMBLY	29	EA	_____	_____
4.33	REMOVE EXISTING FIRE HYDRANT ASSEMBLY	30	EA	_____	_____
4.34	2" WATER SERVICE (CONNECT TO 1", 1.5", OR 2" BUILDING SERVICE)	24	EA	_____	_____
4.35	3" WATER SERVICE (CONNECT TO 2.5", OR 3" BUILDING SERVICE)	6	EA	_____	_____
4.36	EXTRA LENGTH 2" HDPE SERVICE LINE OVER 5FT LENGTH (ALL DEPTHS) (STREET TRENCH)	421	LF	_____	_____
4.37	EXTRA LENGTH 2" HDPE SERVICE LINE OVER 5FT LENGTH (ALL DEPTHS) (OFF STREET TRENCH)	2007	LF	_____	_____
4.38	12" FIELD CONNECTION	2	EA	_____	_____
4.39	6" FIELD CONNECTION	1	EA	_____	_____
4.40	2.5" FIELD CONNECTION	1	EA	_____	_____
	TRENCHLES WATER SUBTOTAL				_____
5.00	**TRENCHLESS WASTEWATER**				
5.01	8" DR 17 HDPE BY PIPE BURSTING EXISTING 6" VCP/STEEL	126	LF	_____	_____
5.02	8" DR 17 HDPE BY PIPE BURSTING EXISTING 8" VCP/STEEL	4540	LF	_____	_____
5.03	8" DR 17 HDPE BY PIPE BURSTING EXISTING 10" VCP/STEEL	744	LF	_____	_____
5.04	8" DR 17 HDPE BY PIPE BURSTING EXISTING 12" VCP/STEEL	178	LF	_____	_____
5.05	12" DR 17 HDPE BY PIPE BURSTING EXISTING 8" VCP/STEEL	373	LF	_____	_____
5.06	12" DR 17 HDPE BY PIPE BURSTING EXISTING 10" VCP/STEEL	713	LF	_____	_____
5.07	16" DR 17 HDPE BY PIPE BURSTING EXISTING 10" VCP/STEEL	213	LF	_____	_____
5.08	16" DR 17 HDPE BY PIPE BURSTING EXISTING 12" VCP/STEEL	1515	LF	_____	_____
5.09	16" DR 17 HDPE BY PIPE BURSTING EXISTING 15" VCP/STEEL	97	LF	_____	_____

5.10	18" DR 17 HDPE BY PIPE BURSTING EXISTING 15" VCP/STEEL	354	LF	_____	_____
5.11	18" DR 17 HDPE BY PIPE BURSTING EXISTING 18" VCP/STEEL	716	LF	_____	_____
5.12	4' DIAMETER MANHOLE (0'- 5' DEEP) WITH STANDARD COVER	33	EA	_____	_____
5.13	6' DIAMETER MANHOLE (0'- 5' DEEP) WITH STANDARD COVER	4	EA	_____	_____
5.14	4' DIAMETER MANHOLE (0'-5' DEEP) WITH WATERTIGHT COVER	1	EA	_____	_____
5.15	EXTRA DEPTH FOR 6' DIAMETER MANHOLE OVER 5' DEEP	11	VF	_____	_____
5.16	EXTRA DEPTH FOR 4' DIAMETER MANHOLE OVER 5' DEEP	75	VF	_____	_____
5.17	CONNECT EX. 4" SEWER TO PROP. MANHOLE	4	EA	_____	_____
5.18	CONNECT EX. 6" SEWER TO PROP. MANHOLE	13	EA	_____	_____
5.19	CONNECT EX. 8" SEWER TO PROP. MANHOLE	14	EA	_____	_____
5.20	CONNECT EX. 10" SEWER TO PROP. MANHOLE	2	EA	_____	_____
5.21	CONNECT EX. 12" SEWER TO PROP. MANHOLE	1	EA	_____	_____
5.22	CONNECT EX. 15" SEWER TO PROP. MANHOLE	1	EA	_____	_____
5.23	4" EXTERNAL DROP FIXTURE	1	EA	_____	_____
5.24	6" EXTERNAL DROP FIXTURE	3	EA	_____	_____
5.25	8" EXTERNAL DROP FIXTURE	2	EA	_____	_____
5.26	REMOVE EXISTING SANITARY SEWER MANHOLE	48	EA	_____	_____
5.27	ABANDON EXISTING SANITARY SEWER MANHOLE	6	EA	_____	_____
5.28	4" SANITARY SEWER SERVICE WITH 2-WAY CLEANOUT AND CONNECT TO SERVICE	5	EA	_____	_____
5.29	6" SANITARY SEWER SERVICE WITH 2-WAY CLEANOUT AND CONNECT TO SERVICE	6	EA	_____	_____
5.30	PLUG 2" SANITARY SEWER LINE	1	EA	_____	_____
5.31	PLUG 4" SANITARY SEWER LINE	2	EA	_____	_____
5.32	PLUG 6" SANITARY SEWER LINE	4	EA	_____	_____

5.33	PLUG 8" SANITARY SEWER LINE	13	EA	_____	_____
5.34	PLUG 10" SANITARY SEWER LINE	3	EA	_____	_____
5.35	PLUG 15" SANITARY SEWER LINE	1	EA	_____	_____
5.36	PLUG 18" SANITARY SEWER LINE	1	EA	_____	_____

TRENCHLESS WASTEWATER SUBTOTAL _____

BASE BID TOTAL _____

A2.00 ADDITIVE ALTERNATE A – REPLACE BID ITEMS WITH ALTERNATE ITEMS BELOW

A2.01	16" DR 17 HDPE PIPE (ALL DEPTHS) INCLUDING EXCAVATION & ALL BACKFILL (OFF STREET TRENCH)	53	LF	_____	_____
A2.02	16" DR 17 HDPE PIPE (ALL DEPTHS) INCLUDING EXCAVATION & ALL BACKFILL (STREET TRENCH)	52	LF	_____	_____
A2.03	12" DR 17 HDPE PIPE (ALL DEPTHS) INCLUDING EXCAVATION & ALL BACKFILL (OFF STREET TRENCH)	2390	LF	_____	_____
A2.04	12" DR 17 HDPE PIPE (ALL DEPTHS) INCLUDING EXCAVATION & ALL BACKFILL (STREET TRENCH)	5328	LF	_____	_____
A2.05	8" DR 17 HDPE PIPE (ALL DEPTHS) INCLUDING EXCAVATION & ALL BACKFILL (OFF STREET TRENCH)	741	LF	_____	_____
A2.06	8" DR 17 HDPE PIPE (ALL DEPTHS) INCLUDING EXCAVATION & ALL BACKFILL (STREET TRENCH)	2147	LF	_____	_____
A2.07	6" DR 17 HDPE PIPE (ALL DEPTHS) INCLUDING EXCAVATION & ALL BACKFILL (OFF STREET TRENCH)	197	LF	_____	_____
A2.08	6" DR 17 HDPE PIPE (ALL DEPTHS) INCLUDING EXCAVATION & ALL BACKFILL (STREET TRENCH)	54	LF	_____	_____

ADDITIVE ALTERNATE A TOTAL _____

6.00 ADDITIVE ALTERNATE B

6.01	SODDING	83	SY	_____	_____
6.02	4' DIAMETER MANHOLE (0'- 5' DEEP) WITH STANDARD COVER	1	EA	_____	_____
6.03	4' DIAMETER MANHOLE (0'-5' DEEP) WITH WATERTIGHT COVER	3	EA	_____	_____
6.04	12" DR 17 HDPE BY PIPE BURSTING EXISTING 10" VCP/STEEL	1347	LF	_____	_____

6.05	EXTRA DEPTH FOR 4' DIAMETER MANHOLE OVER 5' DEEP	24	VF	_____	_____
6.06	CONNECT EX. 8" SEWER TO PROP. MANHOLE	2	EA	_____	_____
6.07	REMOVE EXISTING SANITARY SEWER MANHOLE	4	EA	_____	_____
6.08	10'x10' CONCRETE MANHOLE SLAB	3	EA	_____	_____
			ADDITIVE ALTERNATE B TOTAL		_____

7.00 ADDITIVE ALTERNATE C

7.01	SODDING	1400	SY	_____	_____
7.02	CLASS B SURFACE REPLACEMENT	250	LF	_____	_____
7.03	REMOVE & REPLACE EXISTING CURB & GUTTER	66	LF	_____	_____
7.04	REMOVE & REPLACE EXISTING SIDEWALK (OPEN CUT)	310	LF	_____	_____
7.05	4' DIAMETER MANHOLE (0'- 5' DEEP) WITH STANDARD COVER	24	EA	_____	_____
7.06	8" DR 17 HDPE BY PIPE BURSTING EXISTING 6" VCP/STEEL	1099	LF	_____	_____
7.07	8" DR 17 HDPE BY PIPE BURSTING EXISTING 6" VCP/STEEL	4751	LF	_____	_____
7.08	EXTRA DEPTH FOR 4' DIAMETER MANHOLE OVER 5' DEEP	55	VF	_____	_____
7.09	CONNECT EX. 4" SEWER TO PROP. MANHOLE	1	EA	_____	_____
7.10	CONNECT EX. 6" SEWER TO PROP. MANHOLE	22	EA	_____	_____
7.11	6" SANITARY SEWER SERVICE WITH 2-WAY CLEANOUT AND CONNECT TO SERVICE	70	EA	_____	_____
7.12	REMOVE EXISTING SANITARY SEWER MANHOLE	24	EA	_____	_____
			ADDITIVE ALTERNATE C TOTAL		_____

8.00 ADDITIVE ALTERNATE D

8.01	SODDING	1417	SY	_____	_____

8.02	CLASS B SURFACE REPLACEMENT	160	LF	_____	_____
8.03	REMOVE & REPLACE EXISTING CURB & GUTTER	45	LF	_____	_____
8.04	REMOVE & REPLACE EXISTING SIDEWALK (OPEN CUT)	150	LF	_____	_____
8.05	4' DIAMETER MANHOLE (0'- 5' DEEP) WITH STANDARD COVER	25	EA	_____	_____
8.06	4' DIAMETER MANHOLE (0'-5' DEEP) WITH WATERTIGHT COVER	3	EA	_____	_____
8.07	8" DR 17 HDPE BY PIPE BURSTING EXISTING 6" VCP/STEEL	295	LF	_____	_____
8.08	8" DR 17 HDPE BY PIPE BURSTING EXISTING 6" VCP/STEEL	6303	LF	_____	_____
8.09	EXTRA DEPTH FOR 4' DIAMETER MANHOLE OVER 5' DEEP	65	VF	_____	_____
8.10	CONNECT EX. 6" SEWER TO PROP. MANHOLE	11	EA	_____	_____
8.11	6" SANITARY SEWER SERVICE WITH 2-WAY CLEANOUT AND CONNECT TO SERVICE	56	EA	_____	_____
8.12	REMOVE EXISTING SANITARY SEWER MANHOLE	28	EA	_____	_____
8.13	PLUG 8" SANITARY SEWER LINE	1	EA	_____	_____
			ADDITIVE ALTERNATE D TOTAL		_____

9.00 ADDITIVE ALTERNATE E

9.01	SODDING	1967	SY		
9.02	CLASS B SURFACE REPLACEMENT	100	LF	_____	_____
9.03	REMOVE & REPLACE EXISTING CURB & GUTTER	15	LF	_____	_____
9.04	REMOVE & REPLACE EXISTING SIDEWALK (OPEN CUT)	620	LF	_____	_____
9.05	REMOVE & REPLACE EXISTING SIDEWALK / PAVERS (TRENCHLESS)	500	SF	_____	_____
9.06	4' DIAMETER MANHOLE (0'- 5' DEEP) WITH STANDARD COVER	21	EA	_____	_____
9.07	8" DR 17 HDPE BY PIPE BURSTING EXISTING 6" VCP/STEEL	6197	LF	_____	_____
9.08	EXTRA DEPTH FOR 4' DIAMETER MANHOLE OVER 5' DEEP	96	VF	_____	_____

9.09	CONNECT EX. 4" SEWER TO PROP. MANHOLE	15	EA	_____	_____
9.10	CONNECT EX. 8" SEWER TO PROP. MANHOLE	9	EA	_____	_____
9.11	4" SANITARY SEWER SERVICE WITH 2-WAY CLEANOUT AND CONNECT TO SERVICE	120	EA	_____	_____
9.12	REMOVE EXISTING SANITARY SEWER MANHOLE	21	EA	_____	_____
			ADDITIVE ALTERNATE E TOTAL		_____

TOTAL BASE BID :_____Dollars__($_____)

TOTAL ADD ALT A:_____Dollars__($_____)

TOTAL ADD ALT B:_____Dollars__($_____)

TOTAL ADD ALT C:_____Dollars__($_____)

TOTAL ADD ALT D:_____Dollars__($_____)

TOTAL ADD ALT E:_____Dollars__($_____)

(**Note:** All amounts shall be shown in both written and figure form. In case of discrepancy between the written amount and the figure, the written amount will govern. For alternates, check whether it is an add, deduct or no change.)

We have included, in the Proposal sum, all material and contingency allowances described in Section 01200 – PRICE AND PAYMENT PROCEDURES.

If the contract is bid with alternates, TSTC reserves the right to select any combination of alternates and will then compare all bids using the selected alternates. If the amount of the bids exceeds the funds available to finance the contract, TSTC may (i) reject all bids or (ii) may award the contract based on the base bid with such deductions as produces a net total which is available within the available funds.

The undersigned acknowledges receipt of____ addenda to the Drawings and Project Manual as follows:

No._____ Date_____ No____ Date_____ No.____ Date_____

No._____ Date_____ No____ Date_____ No.____ Date_____

(The Proposer is to fill in I.D. Number and date of each thereby acknowledging receipt of Addenda).

If awarded the contract, the undersigned agrees to commence work under this contract (See Notice to Proceed) and to substantially complete the project within _____ (Proposer to fill in days) calendar days from said commencement date, unless modified by change order.

Proposer agrees to pay the Owner $500.00 per day, as liquidated damages, for each day the substantial completion of this project extends beyond the stipulated substantial completion date.

If notified of the acceptance of this proposal within thirty (30) days of the time set for the opening of

proposals, proposer agrees within ten (10) days of notification, to execute a contract in the form of the Standard Form of Agreement Between Owner and Contractor where the Basis of Payment Is a Stipulated Sum, as amended for the above work, for the above stated compensation.

Respectfully Submitted,

Respondent's Name: _____

Respondent's State of Texas Tax Account No.: _____
(This 11 digit number is mandatory)

If a Corporation:

Respondent's State of Incorporation: _____

Respondent's Charter No: _____

Identify each person who owns at least 25% of the Respondent's business entity by name:

_____
(Name)

_____
(Name)

_____
(Name)

_____
(Name)

Submitted and Certified By:

_____	_____
(Respondent's Name)	*(Title)*
_____	_____
(Street Address)	*(Telephone Number)*
_____	_____
(City, State, Zip Code)	*(Fax Number)*
_____	_____
(Authorized Signature)	*(Date)*

Attachment C: Terms and Conditions

ITEMS BELOW APPLY TO AND BECOME A PART OF TERMS AND CONDITIONS OF RFP, ANY EXCEPTIONS THERE TO MUST BE IN WRITING.

A. BIDDING REQUIREMENTS

1. Proposers must comply with all rules, regulations and statutes relating to purchasing in the State of Texas in addition to the requirements of this form.

2. RFP should be submitted on this form. RFP must be time stamped at ordering agency on or before the hour and date specified for the RFP opening.

3. Late and/or unsigned RFP will not be considered under any circumstances. Person signing RFP must have the authority to bind the firm in a contract.

4. RFP should give Payee ID Number, full firm name and address of proposer on the face of this form. Enter in the space provided, if not shown. Additionally, firm name should appear on each continuation page of a RFP, in the block provided in the upper right hand corner. The Payee ID Number is the taxpayer number assigned and used by the Comptroller of Public Accounts of Texas. If this number is not known, complete the following:

   Enter Federal Employer's Identification Number

   _____

   Sole owner should also enter Social Security Number

   _____

5. RFP cannot be altered or amended after opening time. Alterations made before opening time should be initialed by proposer or his authorized agent. No RFP can be withdrawn after opening time without approval by TSTC based on an acceptable written reason.

6. TSTC reserves the right to accept or reject all or any part of any kind, waive minor technicalities and award the RFP to best serve the interests of TSTC.

7. Consistent and continued tie bidding could cause rejection of RFP by TSTC and/or investigation for antitrust violations.

8. TSTC shall not be responsible for failure of electronic equipment or operator error. Late illegible, incomplete, or otherwise non-responsive RFP’S will not be considered.

B. VENDOR ASSIGNMENTS

Vendor hereby assigns to ordering agency any and all claims for overcharges associated with this contract arising under the antitrust laws of the United States 15 U.S.C.A. Section 1, et seq. (1973), and the antitrust laws of the State of Texas, TEX. Bus. & Comm. Code Ann. Sec. 15.01, et seq. (1967). Inquiries pertaining to RFPs must give the requisition number, codes, and opening date.

C. BIDDER AFFIRMATION

Signing this RFP with a false statement is a material breach of contract and shall void the submitted RFP or any resulting contracts, and the vendor shall be removed from all bid lists.

1. The proposer has not given, offered to give, nor intends to give at any time hereafter any economic opportunity, future employment, gift, loan, gratuity, special discount, trip, favor, or service to a public servant in connection with the submitted RFP.

2. Neither the proposer nor the firm, corporation, partnership, or institution represented by the proposer, or anyone acting for such firm, corporation or institution has violated the antitrust laws of this State or the Federal Antitrust Laws (see section 9, above), nor communicated directly or indirectly the RFP made to any competitor or any other person engaged in such line of business.

3. Pursuant to Section 2155.004 Government Code the proposer has not received compensation for participation in the preparation of the specifications for this RFP.

4. Pursuant to Section 231.006(d), Family Code (relating to child support), the proposer certifies that the individual or business entity named in this RFP is not in ineligible to receive this specified payment and acknowledges that this contract may be terminated and payment may be withheld if this certification is inaccurate.

5. Under Section 2155.004 Government Code the proposer certifies that the individual or business entity named in this RFP is not ineligible to receive the specified contract and acknowledges that this contract may be terminated and/or payment withheld if this certification is inaccurate.

6. The Contractor shall defend, indemnify, and hold harmless TSTC, all of its officers, agents and employees from and against all claims, actions, suits, demands, proceedings, costs, damages, and liabilities, arising out of, connected with, or resulting from any acts or commissions of contractor or any agent, employee, subcontractor, or supplier of contractor in the execution or performance of this contract.

7. Proposer agrees that any payments due under this will be applied towards any debt, including but not limited to delinquent taxes and child support that is owed to the State of Texas.

8. Proposer certifies that they are in compliance with section 669.003 of the Government Code, relating to contracting with executive head of a State agency. If section 669.003 applies proposer will complete the following information in order for the RFP to be evaluated:

   Name of Former executive: _____

   Name of State agency: _____

   Date of separation from State agency: _____

   Date of Employment with proposer: _____

9. Proposer agrees to comply with government Code 2155.4441, pertaining to service contract use of products in the State of Texas.

11. Pursuant to Section 231.006©, Family Code,

RFP must include names and Social Security Numbers of each person with at least 25% ownership of the business entity submitting the RFP. Attach name & social security numbers for each person. This information must be provided prior to contract award.

12. NOTE TO PROPOSER:

Any terms and conditions attached to a RFP will not be considered unless specifically referred to on this RFP form and may result in disqualification of the RFP. The dispute resolution process provided for in chapter 2260 of the Texas Government Code must be used by the ordering agency and the contractor to attempt to resolve all disputes arising under this contract. Any legal actions must be filed in McLennan County or Travis County, Texas will be the proper place of venue for suit on or in respect of the any future Agreement.

13. BEST VALUE CRITERIA

- the quality, availability, and adaptability of the supplies, materials, equipment, or contractual services to the particular use required;
- the number and scope of conditions attached to the RFP;
- the ability, capacity, and skill of the proposer to perform the contract or provide the service required;
- whether the proposer can perform the contract or provide the service promptly, or within the time required, without delay or interference;
- the character, responsibility, integrity, reputation, and experience of the proposer;
- proximity of the proposer's office to the site, and is there a firm principal at the local office, and how much of the design work will be done at the local office;
- related to the above, how close are the proposer's sub-consultants to the site, and are there firm principals at the local sub-consultants' offices, and how much of the design work will be done at the local sub-consultants' offices;
- the quality of performance of previous contracts or services;
- any previous or existing noncompliance by the proposer with specification requirements relating to time of submission of specified data such as samples, models, drawings, certificates, or other information; the sufficiency of the financial resources and ability of the proposer to perform the contract or provide the service;
- and the ability of the proposer to provide future maintenance, repair parts, and service for the use of the contract.
- The purchase price:
- Any relevant criteria specifically listed in the RFP or request for proposals.

Attachment D - Conflict of Interest Questionnaire

CONFLICT OF INTEREST QUESTIONNAIRE

FORM CIQ

For vendor or other person doing business with local governmental entity

This questionnaire reflects changes made to the law by H.B. 1491, 80th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code by a person who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the person meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the person becomes aware of facts that require the statement to be filed. *See* Section 176.006, Local Government Code.

A person commits an offense if the person knowingly violates Section 176.006, Local Government Code. An offense under this section is a Class C misdemeanor.

OFFICE USE ONLY

Date Received

1 **Name of person who has a business relationship with local governmental entity.**

2 ☐ **Check this box if you are filing an update to a previously filed questionnaire.**

(The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date the originally filed questionnaire becomes incomplete or inaccurate.)

3 **Name of local government officer with whom filer has employment or business relationship.**

_____

Name of Officer

This section (item 3 including subparts A, B, C & D) must be completed for each officer with whom the filer has an employment or other business relationship as defined by Section 176.001(1-a), Local Government Code. Attach additional pages to this Form CIQ as necessary.

A. Is the local government officer named in this section receiving or likely to receive taxable income, other than investment income, from the filer of the questionnaire?

☐ Yes ☐ No

B. Is the filer of the questionnaire receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer named in this section AND the taxable income is not received from the local governmental entity?

☐ Yes ☐ No

C. Is the filer of this questionnaire employed by a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership of 10 percent or more?

☐ Yes ☐ No

D. Describe each employment or business relationship with the local government officer named in this section.

4

_____ _____

Signature of person doing business with the governmental entity Date

Attachment E – SAMPLE AGREEMENT BETWEEN OWNER AND CONTRACTOR

CONTRACT NO. _____

This Agreement is made the 1st day of May, in the year 2017, by and between _____, hereinafter called the Contractor, and Texas State Technical College (TSTC), an institution of higher education and an agency of the State of Texas, hereinafter called the Owner.

WITNESSETH, that the Contractor and the Owner, for the consideration hereinafter named, agree as follows:

ARTICLE 1. SCOPE OF WORK: The Contractor shall furnish all of the materials and perform all of the work shown on the drawings and described in the specifications for the project entitled "**TSTC Water & Wastewater Line Replacement**" in Waco, Texas" (Project No. _____). The Construction Drawings and Specifications were prepared by TSTC Waco physical Plant. TSTC's 2012 Uniform General Conditions (UGC) are incorporated by reference for all purposes, and attached hereto as **Exhibit 1**. The Contractor shall do everything required by this Agreement, the Uniform General Conditions, the Special Conditions, the Addenda, the Specifications, the Drawings, the Proposal (attached as **Exhibit 2,** including any unit prices stated therein), and the Historically Underutilized Business (HUB) Subcontracting Plan (attached as **Exhibit 3, if applicable**)

ALTERNATES: The following Alternate Proposals, fully described in the Specifications, are included as a part of this Contract: NONE

ARTICLE 2. TIME OF COMPLETION: The Owner shall provide a Notice to Proceed in which a date for commencement of the work shall be stated; such commencement date shall be 10 or more days after the date of the notice. The Contractor shall achieve substantial completion of the work within Twenty One (21) calendar days after such commencement date; as such completion date may be extended by approved Change Orders. The time set forth for completion of the work is an essential element of the Contract.

ARTICLE 3. THE CONTRACT SUM: The Owner shall pay the Contractor for performance of the Contract, subject to additions and deductions provided therein, the sum of XXXX XXXX Dollars and No Cents ($XX.xxxx), and make payment on account as hereinafter provided.

ARTICLE 4. HUB SUBCONTRACTING PLAN: The Owner has adopted a Policy on Utilization of Historically Underutilized Business ("Policy"), which is incorporated herein by reference. Contractor, as a provision of the Agreement must comply with the requirements of the Policy and adhere to the HUB Subcontracting Plan submitted with Contractor's Proposal and attached as **Exhibit 3**. No changes to the HUB Subcontracting Plan can be made by the Contractor without the prior written approval of the Owner in accordance with the Policy.

ARTICLE 5. DEFAULT: Owner may, by written notice of default to the Contractor terminate this Agreement, in whole or in part, for cause if the Contractor fails to perform in full compliance with the contract requirements, through no fault of Owner. Owner will provide a thirty (30) day written notice of termination to the Contractor (delivered by certified mail, return receipt requested) of intent to terminate, and Owner will provide the Contractor with an opportunity for consultation with Owner prior to termination.

ARTICLE 6. LIQUIDATED DAMAGES: For each consecutive calendar day after the substantial completion period set forth in Article 2 above that any work, including the correction of deficiencies found during the final testing and inspection, is not completed, the amount of Five Hundred Dollars ($500) will be deducted

from the money due or becomes due the Contractor, not as a penalty but as liquidated damages representing the parties' estimate at the time of contract execution of the damages which the Owner will sustain for late completion.

ARTICLE 7. CERTIFICATION OF NO ASBESTOS CONTAINING MATERIALS OR WORK:

The Contractor shall provide a certification statement, included with each materials submittal, stating that no asbestos containing materials or work is included within the scope of the proposed submittal.

The Contractor shall insure that Texas Department of Health licensed individuals, consultants or companies are used for any required asbestos work including asbestos inspection, asbestos abatement plans/specifications, asbestos abatement, asbestos project management and third-party asbestos monitoring.

The Contractor shall provide at Substantial Completion, a notarized affidavit to the Owner and the Engineer stating that no asbestos containing materials or work was provided, installed, furnished or added to the Project.

The Contractor shall take whatever measures he deems necessary to insure that all employees, suppliers, fabricators, materialmen, subcontractors, or their assigns, comply with this requirement.

All materials used on this Project shall be certified as non-Asbestos Containing Building Materials (ACBM). The Contractor shall insure compliance with the following acts from all of his subcontractors and assigns:

Asbestos Hazard Emergency Response Act (AHERA—40 CFR 763-99 (7));

National Emission Standards for Hazardous Air Pollutants (NESHAP—EPA 40 CFR 61, National Emission Standard for Asbestos)

Texas Asbestos Health Protection Rules (TAHRP—Tex. Admin. Code Title 25, Part 1, Ch. 295C, Asbestos Health Protection)

Every subcontractor shall provide a notarized statement that no ACBM has been used, provided, or left on this Project.

The Contractor shall provide, in hard copy and electronic form, all necessary material safety data sheets (MSDS) of all products used in the construction of the Project to the Texas Department of Health licensed inspector or Project Engineer who will compile the information from the MSDS and, finding no asbestos in any of the product, make a certification statement.

At Final Completion the Contractor shall provide a notarized certification statement per TAC Title 25 Part 1, Ch. 295.34, par. c.1 that no ACBM was used during construction of the Project.

ARTICLE 8. INDEPENDENT CONTRACTOR: Both parties hereto, in the performance of this contract, shall act in an individual capacity and not as agents, employees, partners, joint ventures or associates of one another. The employees or agents of one party shall not be deemed or construed to be the employees or agents of the other party for any purpose whatsoever. The Contractor shall be responsible for providing all necessary unemployment and workers' compensation insurance for the Contractor's employees.

ARTICLE 9. INSURANCE: The Contractor shall procure and maintain, at its expense, during the term of the contract or any extensions thereof, insurance as listed below. Insurance shall be written by companies

acceptable to Owner and authorized to do business in the State of Texas. Policies shall include terms and provisions indicated below. The Contractor shall provide and furnish evidence of the following insurance:

Workers Compensation – Minimum coverage for employer liability in the amount of One Million Dollars ($1,000,000.00) per occurrence and One Million Dollars ($1,000.000.00) annual aggregate;

Business Automobile Liability Insurance - Minimum coverage for employer liability in the amount of One Million Dollars ($1,000,000.00) per occurrence;

Comprehensive General Liability - Minimum coverage for employer liability in the amount of One Million Dollars ($1,000,000.00) per occurrence and Two Million Dollars ($2,000.000.00) annual aggregate.

Contractor shall obtain and maintain in full force at all times during the term of this contract insurance coverage naming the State of Texas, acting through Texas State Technical College Waco, as an additional insured and loss payee on its policies described above.

Each policy of required insurance shall provide for ten (10) days written notice of cancellation to Owner and include the following provisions: "It is a condition of this policy that the Company shall furnish written notice to Texas State Technical College Waco, 3801 Campus Drive, Waco, Texas 76705 ten (10) days in advance of any reduction in, or cancellation of this policy."

Insurance shall be effective and evidence of acceptable insurance furnished to Owner prior to commencing any operations under this Agreement.

ARTICLE 10. BONDS: Contractor is required to tender to Owner, prior to commencing the Work, performance and payment bonds, as required by Chapter 2253, *Texas Government Code.*

Each bond shall be executed by a corporate surety or sureties authorized to do business in the State of Texas and acceptable to Owner, on Owner's form, and in compliance with the relevant provisions of the *Texas Insurance Code.* If any bond is for more than ten (10) percent of the surety's capital and surplus, Owner may require certification that the company has reinsured the excess portion with one or more reinsurers authorized to do business in the State. A reinsurer may not reinsure for more than ten (10) percent of its capital and surplus. If a surety upon a bond loses its authority to do business in the State, Contractor shall, within thirty (30) days after such loss, furnish a replacement bond at no added cost to Owner.

Contractor shall provide Performance and Payment bonds before the execution of this Agreement. Each bond shall be accompanied by a valid power of attorney (issued by the surety company and attached, signed and sealed with the corporate embossed seal, to the bond) authorizing the attorney-in-fact who signs the bond to commit the company to the terms of the bond, and stating any limit in the amount for which the attorney can issue a single bond.

IF FOR ANY REASON A STATUTORY PAYMENT OR PERFORMANCE BOND IS NOT HONORED BY THE SURETY, CONTRACTOR SHALL FULLY INDEMNIFY AND HOLD OWNER HARMLESS OF AND FROM ANY COSTS, LOSSES, OBLIGATIONS OR LIABILITIES IT INCURS AS A RESULT.

ARTICLE 11. ACCEPTANCE OF BID OR AWARD OF CONTRACT: By signing this Agreement, the undersigned certifies as follows:

Assignment. This Agreement is a personal service contract for the services of Construction, and Contractor's

interest in this Agreement, duties hereunder and/or fees due hereunder may not be assigned or delegated to a third party.

Records of expenses pertaining to Additional Services and services performed on the basis of a Worker Wage Rate or Monthly Salary Rate shall be kept on the basis of generally accepted accounting principles and in accordance with cost accounting standards promulgated by the Federal Office of Management and Budget Cost Accounting Standards Board and shall be available for audit by the Owner or the Owner's authorized representative on reasonable notice.

Family Code Child Support Certification. Pursuant to Section 231.006, Texas Family Code, Contractor certifies that it is not ineligible to receive the specified grant, loan or payment and acknowledges that this contract may be terminated and payment may be withheld if this certification is inaccurate.

Background Checks. Contractor is required to do a Department of Public Safety background check on each and every person on the project site. The Contractor also ensures that any employees or assigns that are noted on the Department of Public Safety background reporting are in compliance with federal laws and the laws of the State of Texas.

Access and Identification. All personnel, while on the project site, must have all of the following:

1. A valid State of Texas ID or driver's license.
2. A photo ID bearing:
    a. the name of the company for which the individual works,
    b. the individual's name,
    c. a recent photo of the individual.

Sexual Offender Search. TSTC recognizes that some sexual offenders, after having served their sentence, are no longer considered to be a threat to society, and the State of Texas has approved them to work in Higher Educational environments. The Respondent ensures that it, and all of its subcontractors and assigns that will be on TSTC property have been searched on the Texas Public Sex Offender Registry. The Contractor also ensures that any employees or assigns that are on the Texas Public Sex Offender Registry or any other state or federal sexual offender registry are in compliance with federal laws and the laws of the State of Texas regarding sexual offenders. The Texas Public Sex Offender Registry website is: https://records.txdps.state.tx.us/SexOffender. The National Sex Offender Public Website is: http://www.nsopw.gov/. Any employees, subcontractors, or assigns that are shown on the sexual offender registries must be documented. Documentation shall include explanation and verification of any employees, assigns or subcontractors that appear on the sexual offender lists; and show that those on the lists have met the requirements of the State of Texas to work on the property of higher education facilities.

Eligibility Certification. Pursuant to Section 2155.004, Texas Government Code, Contractor certifies that the individual or business entity named in this Agreement is not ineligible to receive the award of or payments under this Agreement and acknowledges that this Agreement may be terminated and payment withheld if this certification is inaccurate.

Franchise Tax Certification. A corporate or limited liability company Contractor certifies that it is not currently delinquent in the payment of any Franchise Taxes due under Chapter 171 of the Texas Tax Code, or that the corporation or limited liability company is exempt from the payment of such taxes, or that the corporation or limited liability company is an out-of-state corporation or limited liability company that is not subject to the Texas Franchise Tax, whichever is applicable.

Payment of Debt or Delinquency to the State. Pursuant to Sections 2107.008 and 2252.903, Texas Government Code, Contractor agrees that any payments owing to Contractor under this Agreement may be

applied directly toward any debt or delinquency that Contractor owes the State of Texas or any agency of the State of Texas regardless of when it arises, until such debt or delinquency is paid in full.

Entire Agreement; Modifications. This Agreement supersedes all prior agreements, written or oral, between Contractor and Owner and shall constitute the entire Agreement and understanding between the parties with respect to the Project. This Agreement and each of its provisions shall be binding upon the parties and may not be waived, modified, amended or altered except by a writing signed by Contractor and Owner.

Counterparts. This Agreement may be executed in counterparts, each of which will be deemed an original, but all of which together will constitute one and the same agreement. Signatures to this Agreement transmitted by facsimile transmission, by electronic mail in "portable document format" (".pdf") form, or by any other electronic means intended to preserve the original graphic and pictorial appearance of a document, will have the same effect as physical delivery of the paper document bearing the original signature.

Captions. The captions of paragraphs in this Agreement are for convenience only and shall not be considered or referred to in resolving questions of interpretation or construction.

Governing Law and Venue. This Agreement and all of the rights and obligations of the parties and all of the terms and conditions shall be construed, interpreted and applied in accordance with and governed by and enforced under the laws of the State of Texas without reference to its conflicts of law provisions. The county where the Project is located shall be the sole place of venue for any legal action arising from or related to this Agreement or the Project in which the Owner is a party.

Waivers. No delay or omission by either party in exercising any right or power arising from non-compliance or failure of performance by the other party with any of the provisions of this Agreement shall impair or constitute a waiver of any such right or power. A waiver by either party of any covenant or condition of this Agreement shall not be construed as a waiver of any subsequent breach of that or of any other covenant or condition of the Agreement.

Binding Effect. This Agreement shall be binding upon and inure to the benefit of the parties and their respective permitted assigns and successors.

Appointment. Owner hereby expressly reserves the right from time to time to designate by notice to Contractor a representative(s) to act partially or wholly for Owner in connection with the performance of Owner's obligations. Contractor shall act only upon instructions from the designated representative(s) unless otherwise specifically notified to the contrary.

Records. Records of Contractor's costs, reimbursable expenses pertaining to the Project and payments shall be available to Owner or its authorized representative during business hours and shall be retained for four (4) years after final Payment or abandonment of the Project, unless Owner otherwise instructs Contractor in writing.

Notices. All notices, consents, approvals, demands, requests or other communications relied on by the parties shall be in writing. Written notice shall be deemed to have been given when delivered in person to the designated representative of the Contractor or Owner for whom it is intended; or sent by U. S. Mail to the last known business address of the designated representative; or transmitted by fax machine to the last know business fax number of the designated representative. Mail notices are deemed effective upon receipt or on the third business day after the date of mailing, whichever is sooner. Fax notices are deemed effective the next business day after faxing.

Severability. Should any term or provision of this Agreement be held invalid or unenforceable in any respect,

the remaining terms and provisions shall not be affected and this Agreement shall be construed as if the invalid or unenforceable term or provision had never been included.

Illegal Dumping. The Contractor shall ensure that it and all of its Subcontractors and assigns prevent illegal dumping of litter in accordance with Title 5, Texas Health and Safety Code, Chapter 365.

Conflict of Interest. Contractor certifies that no member of the Board of Regents of Texas State Technical College, the Owner, or Executive Officers, including component institutions, has a financial interest, directly or indirectly, in the transaction that is the subject of this contract.
Antitrust. Contractor represents and warrants that neither Contractor nor any firm, corporation, partnership, or institution represented by Contractor, or anyone acting for such firm, corporation or institution has (1) violated the antitrust laws of the State of Texas under Tex. Bus. & Com. Code, Chapter 15, or the federal antitrust laws; or (2) communicated directly or indirectly the Proposal to any competitor or any other person engaged in such line of business during the procurement process for this contract.

Ethics Matters. No Financial Interest. Contractor and its employees, agents, representatives and subcontractors have read and understand TSTC's Purchasing Authority Policy (FA 1.16) available at http://www.tstc.edu/governance/fa, TSTC's Fraudulent Use of Assets and Resources Police (GA 1.15) available at http://www.tstc.edu/governance/ga, TSTC's Ethics and Standards of Conduct Policy (HR 2.1.12) available at http://www.tstc.edu/governance/hr, Texas Government Code 2261.252 and all applicable state ethics laws. Neither Contractor nor its employees, agents, representatives or subcontractors will assist or cause TSTC employees to violate TSTC's Policies or any applicable state ethics law or rule. Contractor represents and warrants that no member of the Board of Regents of TSTC has a direct or indirect financial interest in the transaction that is the subject of this Agreement.

ARTICLE 12. INDEMNIFICATION

CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD HARMLESS THE STATE OF TEXAS, ITS OFFICERS AND EMPLOYEES, AND TEXAS STATE TECHNICAL COLLEGE WACO, THE TEXAS STATE TECHNICAL COLLEGE SYSTEM, IT OFFICERS, REGENTS, EMPLOYEES AND CONTRACTORS, FROM AND AGAINST ALL CLAIMS, ACTIONS, SUITS, DEMANDS, PROCEEDINGS, COSTS, DAMAGES, AND LIABILITIES, INCLUDING WITHOUT LIMITATION ATTORNEYS' FEES AND COURT COSTS, ARISING OUT OF, CONNECTED WITH, OR RESULTING FROM ANY ACTS OR OMISSIONS OF CONTRACTOR OR ANY AGENT, EMPLOYEE, SUBCONTRACTOR, OR SUPPLIER OF CONTRACTOR IN THE EXECUTION OR PERFORMANCE OF THIS CONTRACT. CONTRACTOR SHALL COORDINATE ITS DEFENSE WITH THE TEXAS ATTORNEY GENERAL AS REQUESTED BY TEXAS STATE TECHNICAL COLLEGE WACO.

THIS PARAGRAPH IS NOT INTENDED TO AND SHALL NOT BE CONSTRUED TO REQUIRE CONTRACTOR TO INDEMNIFY OR HOLD HARMLESS THE STATE OR TEXAS STATE TECHNICAL COLLEGE WACO OR TEXAS STATE TECHNICAL COLLEGE SYSTEM FOR ANY CLAIMS OR LIABILITIES RESULTING FROM THE NEGLIGENT ACTS OR OMISSION OF TEXAS STATE TECHNICAL COLLEGE WACO, TEXAS STATE TECHNICAL COLLEGE SYSTEM OR ITS EMPLOYEES.

ARTICLE 13. BREACH OF CONTRACT CLAIMS:

(a) To the extent that Chapter 2260,*Texas Government Code*, as it may be amended from time to time ("Chapter 2260"), is applicable to this Agreement and is not preempted by other applicable law, the

dispute resolution process provided for in Chapter 2260 shall be used, as further described herein, by Owner and Contractor to attempt to resolve any claim for breach of contract made by Contractor:

i. Contractor's claims for breach of this Agreement that the parties cannot resolve pursuant to other provisions of this Agreement or in the ordinary course of business shall be submitted to the negotiation process provided in subchapter B of Chapter 2260. To initiate the process, Contractor shall submit written notice, as required by subchapter B of Chapter 2260, to Owner in accordance with the notice provisions in this Contract. Contractor's notice shall specifically state that the provisions of subchapter B of Chapter 2260 are being invoked, the date and nature of the event giving rise to the claim, the specific Agreement provision that Owner allegedly breached, the amount of damages Contractor seeks, and the method used to calculate the damages. Compliance by Contractor with subchapter B of Chapter 2260 is a required prerequisite to Contractor's filing of a contested case proceeding under subchapter C of Chapter 2260. The Chief Business Officer of Owner, or such other officer of Owner as may be designated from time to time by Owner by written notice thereof to Contractor in accordance with the notice provisions in this Contract, shall examine Contractor's claim and any counterclaim and negotiate with Contractor in an effort to resolve such claims.

ii. If the parties are unable to resolve their disputes under subparagraph (a.) of this section, the contested case process provided in subchapter C of Chapter 2260 is Contractor's sole and exclusive process for seeking a remedy for any and all of Contractor's claims for breach of this Agreement by Owner.

iii. Compliance with the contested case process provided in subchapter C of Chapter 2260 is a required prerequisite to seeking consent to sue from the Legislature under Chapter 107 of the Texas Civil Practices and Remedies Code. The parties hereto specifically agree that (1) neither the execution of this Agreement by Owner nor any other conduct, action or inaction of any representative of Owner relating to this Agreement constitutes or is intended to constitute a waiver of Owner's or the state's sovereign immunity to suit and (2) Owner has not waived its right to seek redress in the courts.

(b) The submission, processing and resolution of Contractor's claim is governed by the published rules adopted by the Texas Attorney General pursuant to Chapter 2260, as currently effective, hereafter enacted or subsequently amended. Owner and Contractor agree that any periods set forth in this Agreement for notice and cure of defaults are not waived.

<u>ARTICLE 14. TEXAS PUBLIC INFORMATION ACT:</u> Notwithstanding any provisions of this Agreement to the contrary, the Contractor understands that Owner will comply with the Texas Public Information Act, Chapter 552, *Texas Government Code,* as interpreted by judicial opinions and opinions of the Attorney General of the State of Texas. Owner agrees to notify Contractor of a request for information related to Contractor's work under this Agreement. The Contractor will cooperate with Owner in the production of documents responsive to the request. The Contractor may request that Owner seek an opinion from the Attorney General of the State of Texas. However, Owner will not honor Contractor's request for an opinion if the request is not based upon a reasonable interpretation of the Texas Public Information Act. Additionally, the Contractor will notify Owner's General Counsel of receipt of any third party requests for information that was provided by the State of Texas for use in conducting this Agreement. This Agreement and all data and other information generated or otherwise obtained in the performance of its responsibilities under this Agreement may be subject to the Texas Public Information Act. Contractor agrees to maintain the confidentiality of information received from the State of Texas during the performance of this Agreement, including information which discloses confidential personal information particularly, but not limited to, social security numbers.

BY SIGNING THE SIGNATURE PAGE BELOW, the Parties have executed and bound themselves to this Agreement as of the day and year first above written.

SIGNATURE PAGE

(SEAL)

ATTEST:

By: _____
(original signature)

_____
(name and title printed)

Date: _____

CONTRACTOR:

By: _____
(original signature)

_____
(name and title printed)

_____
(company name printed)

Date: _____

CONTENT PREPARED BY:

By: _____
(original signature)

TSTC:

By: _____
(original signature)

Name: Selby Holder
Title: Director of Facilities

Date: _____

Name: Kevin Dorton
Title: Vice President of Administrative Services, TSTC Waco

Date: _____

FORM APPROVED:

By: _____
(original signature)
Susan Shafer
Associate General Counsel
Texas State Technical College Waco

Date: _____

Attachment F – PLANS AND SPECIFICATIONS

Due to the size of the file, plans will not be attached to this request for proposal. Below is a link to download the plans if interested in submitting for this proposal

https://walkerpartners.filetransfers.net/downloadFilePublic.php?filePassId=0743abfdf696c453cd6862f1c10d7ed5

Attachment G

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HUB Subcontracting Plan (HSP)

QUICK CHECKLIST

While this HSP Quick Checklist is being provided to merely assist you in readily identifying the sections of the HSP form that you will need to complete, it is very important that you adhere to the instructions in the HSP form and instructions provided by the contracting agency.

➤ **If you will be awarding all of the subcontracting work you have to offer under the contract to only Texas certified HUB vendors, complete:**

- ☐ Section 1 - Respondent and Requisition Information
- ☐ Section 2 a. - Yes, I will be subcontracting portions of the contract.
- ☐ Section 2 b. - List all the portions of work you will subcontract, and indicate the percentage of the contract you expect to award to Texas certified HUB vendors.
- ☐ Section 2 c. - Yes
- ☐ Section 4 - Affirmation
- ☐ GFE Method A (Attachment A) - Complete an Attachment A for each of the subcontracting opportunities you listed in Section 2 b.

➤ **If you will be subcontracting any portion of the contract to Texas certified HUB vendors and Non-HUB vendors, and the aggregate percentage of all the subcontracting work you will be awarding to the Texas certified HUB vendors with which you do not have a *continuous contract** in place for more than five (5) years *meets or exceeds* the HUB Goal the contracting agency identified in the "Agency Special Instructions/Additional Requirements", complete:**

- ☐ Section 1 - Respondent and Requisition Information
- ☐ Section 2 a. - Yes, I will be subcontracting portions of the contract.
- ☐ Section 2 b. - List all the portions of work you will subcontract, and indicate the percentage of the contract you expect to award to Texas certified HUB vendors and Non-HUB vendors.
- ☐ Section 2 c. - No
- ☐ Section 2 d. - Yes
- ☐ Section 4 - Affirmation
- ☐ GFE Method A (Attachment A) - Complete an Attachment A for each of the subcontracting opportunities you listed in Section 2 b.

➤ **If you will be subcontracting any portion of the contract to Texas certified HUB vendors and Non-HUB vendors or only to Non-HUB vendors, and the aggregate percentage of all the subcontracting work you will be awarding to the Texas certified HUB vendors with which you do not have a *continuous contract** in place for more than five (5) years *does not meet or exceed* the HUB Goal the contracting agency identified in the "Agency Special Instructions/Additional Requirements", complete:**

- ☐ Section 1 - Respondent and Requisition Information
- ☐ Section 2 a. - Yes, I will be subcontracting portions of the contract.
- ☐ Section 2 b. - List all the portions of work you will subcontract, and indicate the percentage of the contract you expect to award to Texas certified HUB vendors and Non-HUB vendors.
- ☐ Section 2 c. - No
- ☐ Section 2 d. - No
- ☐ Section 4 - Affirmation
- ☐ GFE Method B (Attachment B) - Complete an Attachment B for each of the subcontracting opportunities you listed in Section 2 b.

➤ **If you will not be subcontracting any portion of the contract and will be fulfilling the entire contract with your own resources (i.e., employees, supplies, materials and/or equipment), complete:**

- ☐ Section 1 - Respondent and Requisition Information
- ☐ Section 2 a. - No, I will not be subcontracting any portion of the contract, and I will be fulfilling the entire contract with my own resources.
- ☐ Section 3 - Self Performing Justification
- ☐ Section 4 - Affirmation

***Continuous Contract**: Any existing written agreement (including any renewals that are exercised) between a prime contractor and a HUB vendor, where the HUB vendor provides the prime contractor with goods or service, to include under the same contract for a specified period of time. The frequency the HUB vendor is utilized or paid during the term of the contract is not relevant to whether the contract is considered continuous. Two or more contracts that run concurrently or overlap one another for different periods of time are considered by CPA to be individual contracts rather than renewals or extensions to the original contract. In such situations the prime contractor and HUB vendor are entering (have entered) into "new" contracts.*

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HUB Subcontracting Plan (HSP)

In accordance with Texas Gov't Code §2161.252, the contracting agency has determined that subcontracting opportunities are probable under this contract. Therefore, all respondents, including State of Texas certified Historically Underutilized Businesses (HUBs) must complete and submit this State of Texas HUB Subcontracting Plan (HSP) with their response to the bid requisition (solicitation).

NOTE: Responses that do not include a completed HSP shall be rejected pursuant to Texas Gov't Code §2161.252(b).

The HUB Program promotes equal business opportunities for economically disadvantaged persons to contract with the State of Texas in accordance with the goals specified in the 2009 State of Texas Disparity Study. The statewide HUB goals defined in 34 Texas Administrative Code (TAC) §20.13 are:

- ***11.2 percent for heavy construction other than building contracts,***
- ***21.1 percent for all building construction, including general contractors and operative builders' contracts,***
- ***32.9 percent for all special trade construction contracts,***
- ***23.7 percent for professional services contracts,***
- ***26.0 percent for all other services contracts, and***
- ***21.1 percent for commodities contracts.***

- - Agency Special Instructions/Additional Requirements - -

*In accordance with 34 TAC §20.14(d)(1)(D)(iii), a respondent (prime contractor) may demonstrate good faith effort to utilize Texas certified HUBs for its subcontracting opportunities if the total value of the respondent's subcontracts with Texas certified HUBs meets or exceeds the statewide HUB goal or the agency specific HUB goal, whichever is higher. When a respondent uses this method to demonstrate good faith effort, the respondent must identify the HUBs with which it will subcontract. If using existing contracts with Texas certified HUBs to satisfy this requirement, only the aggregate percentage of the contracts expected to be subcontracted to HUBs with which the respondent **does not** have a **continuous contract*** in place for **more than five (5) years** shall qualify for meeting the HUB goal. This limitation is designed to encourage vendor rotation as recommended by the 2009 Texas Disparity Study.*

SECTION 1: RESPONDENT AND REQUISITION INFORMATION

a. Respondent (Company) Name: _____ State of Texas VID #: _____

Point of Contact: _____ Phone #: _____

E-mail Address: _____ Fax #: _____

b. Is your company a State of Texas certified HUB? ☐ **- Yes** ☐ **- No**

c. Requisition #: _____ Bid Open Date: _____ (mm/dd/yyyy)

Enter your company's name here: _____ Requisition #: _____

SECTION 2: RESPONDENT's SUBCONTRACTING INTENTIONS

After dividing the contract work into reasonable lots or portions to the extent consistent with prudent industry practices, and taking into consideration the scope of work to be performed under the proposed contract, including all potential subcontracting opportunities, the respondent must determine what portions of work, **including contracted staffing, goods and services will be subcontracted**. Note: In accordance with 34 TAC §20.11, a "Subcontractor" means a person who contracts with a prime contractor to work, to supply commodities, or to contribute toward completing work for a governmental entity.

a. Check the appropriate box (Yes or No) that identifies your subcontracting intentions:

☐ - *Yes*, I will be subcontracting portions of the contract. (If *Yes*, complete Item b of this SECTION and continue to Item c of this SECTION.)

☐ - *No*, I will not be subcontracting any portion of the contract, and I will be fulfilling the entire contract with my own resources, including employees, goods and services. (If *No*, continue to SECTION 3 and SECTION 4.)

b. List all the portions of work (subcontracting opportunities) you will subcontract. Also, based on the total value of the contract, identify the percentages of the contract you expect to award to Texas certified HUBs, and the percentage of the contract you expect to award to vendors that are not a Texas certified HUB (i.e., Non-HUB).

Item #	Subcontracting Opportunity Description	HUBs		Non-HUBs
		Percentage of the contract expected to be subcontracted to HUBs with which you do not have a continuous contract* in place for more than five (5) years.	**Percentage of the contract expected to be subcontracted to HUBs with which you have a continuous contract* in place for more than five (5) years.**	Percentage of the contract expected to be subcontracted to non-HUBs.
1		%	%	%
2		%	%	%
3		%	%	%
4		%	%	%
5		%	%	%
6		%	%	%
7		%	%	%
8		%	%	%
9		%	%	%
10		%	%	%
11		%	%	%
12		%	%	%
13		%	%	%
14		%	%	%
15		%	%	%
	Aggregate percentages of the contract expected to be subcontracted:	**%**	**%**	**%**

(Note: If you have more than fifteen subcontracting opportunities, a continuation sheet is available online at https://www.comptroller.texas.gov/purchasing/vendor/hub/forms.php).

c. Check the appropriate box (Yes or No) that indicates whether you will be using **only** Texas certified HUBs to perform **all** of the subcontracting opportunities you listed in SECTION 2, Item b.

☐ - *Yes* (If *Yes*, continue to SECTION 4 and complete an "HSP Good Faith Effort - Method A (Attachment A)" for **each** of the subcontracting opportunities you listed.)

☐ - *No* (If *No*, continue to Item d, of this SECTION.)

d. Check the appropriate box (Yes or No) that indicates whether the aggregate expected percentage of the contract you will subcontract **with Texas certified HUBs** with which you **do not** have a **continuous contract*** in place with for **more than five (5) years**, **meets or exceeds** the HUB goal the contracting agency identified on page 1 in the "**Agency Special Instructions/Additional Requirements**."

☐ - *Yes* (If *Yes*, continue to SECTION 4 and complete an "HSP Good Faith Effort - Method A (Attachment A)" for **each** of the subcontracting opportunities you listed.)

☐ - *No* (If *No*, continue to SECTION 4 and complete an "HSP Good Faith Effort - Method B (Attachment B)" for **each** of the subcontracting opportunities you listed.)

***Continuous Contract**: Any existing written agreement (including any renewals that are exercised) between a prime contractor and a HUB vendor, where the HUB vendor provides the prime contractor with goods or service under the same contract for a specified period of time. The frequency the HUB vendor is utilized or paid during the term of the contract is not relevant to whether the contract is considered continuous. Two or more contracts that run concurrently or overlap one another for different periods of time are considered by CPA to be individual contracts rather than renewals or extensions to the original contract. In such situations the prime contractor and HUB vendor are entering (have entered) into "new" contracts.*

Enter your company's name here: _____ Requisition #: _____

SECTION 2: RESPONDENT's SUBCONTRACTING INTENTIONS (CONTINUATION SHEET)

This page can be used as a continuation sheet to the HSP Form's page 2, Section 2, Item b. Continue listing the portions of work (subcontracting opportunities) you will subcontract. Also, based on the total value of the contract, identify the percentages of the contract you expect to award to Texas certified HUBs, and the percentage of the contract you expect to award to vendors that are not a Texas certified HUB (i.e., Non-HUB).

Item #	Subcontracting Opportunity Description	HUBs		Non-HUBs
		Percentage of the contract expected to be subcontracted to HUBs with which you do not have a continuous contract* in place for more than five (5) years.	**Percentage of the contract expected to be subcontracted to HUBs with which you have a continuous contract* in place for more than five (5) years.**	**Percentage of the contract expected to be subcontracted to non-HUBs.**
16		%	%	%
17		%	%	%
18		%	%	%
19		%	%	%
20		%	%	%
21		%	%	%
22		%	%	%
23		%	%	%
24		%	%	%
25		%	%	%
26		%	%	%
27		%	%	%
28		%	%	%
29		%	%	%
30		%	%	%
31		%	%	%
32		%	%	%
33		%	%	%
34		%	%	%
35		%	%	%
36		%	%	%
37		%	%	%
38		%	%	%
39		%	%	%
40		%	%	%
41		%	%	%
42		%	%	%
43		%	%	%
	Aggregate percentages of the contract expected to be subcontracted:	**%**	**%**	**%**

***Continuous Contract**: Any existing written agreement (including any renewals that are exercised) between a prime contractor and a HUB vendor, where the HUB vendor provides the prime contractor with goods or service under the same contract for a specified period of time. The frequency the HUB vendor is utilized or paid during the term of the contract is not relevant to whether the contract is considered continuous. Two or more contracts that run concurrently or overlap one another for different periods of time are considered by CPA to be individual contracts rather than renewals or extensions to the original contract. In such situations the prime contractor and HUB vendor are entering (have entered) into "new" contracts.*

Enter your company's name here: _____ Requisition #: _____

SECTION 3: SELF PERFORMING JUSTIFICATION (If you responded "No" to SECTION 2, Item a, you must complete this SECTION and continue to SECTION 4.)

If you responded "No" to SECTION 2, Item a, in the space provided below **explain how** your company will perform the entire contract with its own employees, supplies, materials and/or equipment.

SECTION 4: AFFIRMATION

As evidenced by my signature below, I affirm that I am an authorized representative of the respondent listed in SECTION 1, and that the information and supporting documentation submitted with the HSP is true and correct. Respondent understands and agrees that, if awarded any portion of the requisition:

- The respondent will provide notice as soon as practical to all the subcontractors (HUBs and Non-HUBs) of their selection as a subcontractor for the awarded contract. The notice must specify at a minimum the contracting agency's name and its point of contact for the contract, the contract award number, the subcontracting opportunity they (the subcontractor) will perform, the approximate dollar value of the subcontracting opportunity and the expected percentage of the total contract that the subcontracting opportunity represents. A copy of the notice required by this section must also be provided to the contracting agency's point of contact for the contract no later than ten (10) working days after the contract is awarded.
- The respondent must submit monthly compliance reports (Prime Contractor Progress Assessment Report – PAR) to the contracting agency, verifying its compliance with the HSP, including the use of and expenditures made to its subcontractors (HUBs and Non-HUBs). (The PAR is available at https://www.comptroller.texas.gov/purchasing/docs/hub-forms/ProgressAssessmentReportForm.xls).
- The respondent must seek approval from the contracting agency prior to making any modifications to its HSP, including the hiring of additional or different subcontractors and the termination of a subcontractor the respondent identified in its HSP. If the HSP is modified without the contracting agency's prior approval, respondent may be subject to any and all enforcement remedies available under the contract or otherwise available by law, up to and including debarment from all state contracting.
- The respondent must, upon request, allow the contracting agency to perform on-site reviews of the company's headquarters and/or work-site where services are being performed and must provide documentation regarding staffing and other resources.

Signature	Printed Name	Title	Date (mm/dd/yyyy)

Reminder:

- If you responded "Yes" to SECTION 2, Items c or d, you must complete an "HSP Good Faith Effort - Method A (Attachment A)" for each of the subcontracting opportunities you listed in SECTION 2, Item b.
- If you responded "No" SECTION 2, Items c and d, you must complete an "HSP Good Faith Effort - Method B (Attachment B)" for each of the subcontracting opportunities you listed in SECTION 2, Item b.

HSP Good Faith Effort - Method A (Attachment A)

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Enter your company's name here: ______________________________ Requisition #: ______________

IMPORTANT: If you responded "*Yes*" to **SECTION 2, Items c** or **d** of the completed HSP form, you must submit a completed "HSP Good Faith Effort - Method A (Attachment A)" for each of the subcontracting opportunities you listed in **SECTION 2, Item b** of the completed HSP form. You may photo-copy this page or download the form at https://www.comptroller.texas.gov/purchasing/docs/hub-forms/hub-sbcont-plan-gfe-achm-a.pdf

SECTION A-1: SUBCONTRACTING OPPORTUNITY

Enter the item number and description of the subcontracting opportunity you listed in SECTION 2, Item b, of the completed HSP form for which you are completing the attachment.

Item Number: _____ Description: ______________________________

SECTION A-2: SUBCONTRACTOR SELECTION

List the subcontractor(s) you selected to perform the subcontracting opportunity you listed above in SECTION A-1. Also identify whether they are a Texas certified HUB and their Texas Vendor Identification (VID) Number or federal Employer Identification Number (EIN), the approximate dollar value of the work to be subcontracted, and the expected percentage of work to be subcontracted. When searching for Texas certified HUBs and verifying their HUB status, ensure that you use the State of Texas' Centralized Master Bidders List (CMBL) - Historically Underutilized Business (HUB) Directory Search located at http://mycpa.cpa.state.tx.us/tpasscmblsearch/index.jsp. HUB status code "**A**" signifies that the company is a Texas certified HUB.

Company Name	**Texas certified HUB**	**Texas VID or federal EIN** Do not enter Social Security Numbers. If you do not know their VID / EIN, leave their VID / EIN field blank.	**Approximate Dollar Amount**	**Expected Percentage of Contract**
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%

REMINDER: As specified in SECTION 4 of the completed HSP form, if you (respondent) are awarded any portion of the requisition, you are required to provide notice as soon as practical to all the subcontractors (HUBs and Non-HUBs) of their selection as a subcontractor. The notice must specify at a minimum the contracting agency's name and its point of contact for the contract, the contract award number, the subcontracting opportunity they (the subcontractor) will perform, the approximate dollar value of the subcontracting opportunity and the expected percentage of the total contract that the subcontracting opportunity represents. A copy of the notice required by this section must also be provided to the contracting agency's point of contact for the contract no later than ten (10) working days after the contract is awarded.

HSP Good Faith Effort - Method B (Attachment B)

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Enter your company's name here: _____ Requisition #: _____

IMPORTANT*:** If you responded "No***" to **SECTION 2, Items c** and **d** of the completed HSP form, you must submit a completed "HSP Good Faith Effort - Method B (Attachment B)" for **each** of the subcontracting opportunities you listed in **SECTION 2, Item b** of the completed HSP form. You may photo-copy this page or download the form at https://www.comptroller.texas.gov/purchasing/docs/hub-forms/hub-sbcont-plan-gfe-achm-b.pdf..

SECTION B-1: SUBCONTRACTING OPPORTUNITY

Enter the item number and description of the subcontracting opportunity you listed in SECTION 2, Item b, of the completed HSP form for which you are completing the attachment.

Item Number: _____ Description: _____

SECTION B-2: MENTOR PROTÉGÉ PROGRAM

If respondent is participating as a Mentor in a State of Texas Mentor Protégé Program, submitting its Protégé (Protégé must be a State of Texas certified HUB) as a subcontractor to perform the subcontracting opportunity listed in **SECTION B-1**, constitutes a good faith effort to subcontract with a Texas certified HUB towards that specific portion of work.

Check the appropriate box (Yes or No) that indicates whether you will be subcontracting the portion of work you listed in SECTION B-1 to your Protégé.

☐ - Yes (If *Yes*, continue to SECTION B-4.)

☐ - No / Not Applicable (If *No* or *Not Applicable*, continue to SECTION B-3 and SECTION B-4.)

SECTION B-3: NOTIFICATION OF SUBCONTRACTING OPPORTUNITY

When completing this section you MUST comply with items a, b, c and d, thereby demonstrating your Good Faith Effort of having notified Texas certified HUBs and trade organizations or development centers about the subcontracting opportunity you listed in SECTION B-1. Your notice should include the scope of work, information regarding the location to review plans and specifications, bonding and insurance requirements, required qualifications, and identify a contact person. When sending notice of your subcontracting opportunity, you are encouraged to use the attached HUB Subcontracting Opportunity Notice form, which is also available online at https://www.comptroller.texas.gov/purchasing/docs/hub-forms/HUBSubcontractingOpportunityNotificationForm.pdf.

Retain supporting documentation (i.e., certified letter, fax, e-mail) demonstrating evidence of your good faith effort to notify the Texas certified HUBs and trade organizations or development centers. Also, be mindful that a working day is considered a normal business day of a state agency, not including weekends, federal or state holidays, or days the agency is declared closed by its executive officer. The initial day the subcontracting opportunity notice is sent/provided to the HUBs and to the trade organizations or development centers is considered to be "day zero" and does not count as one of the seven (7) working days.

a. Provide written notification of the subcontracting opportunity you listed in SECTION B-1, to three (3) or more Texas certified HUBs. Unless the contracting agency specified a different time period, you must allow the HUBs at least seven (7) working days to respond to the notice prior to you submitting your bid response to the contracting agency. When searching for Texas certified HUBs and verifying their HUB status, ensure that you use the State of Texas' Centralized Master Bidders List (CMBL) - Historically Underutilized Business (HUB) Directory Search located at http://mycpa.cpa.state.tx.us/tpasscmblsearch/index.jsp. HUB status code "**A**" signifies that the company is a Texas certified HUB.

b. List the **three (3) Texas certified HUBs** you notified regarding the subcontracting opportunity you listed in SECTION B-1. Include the company's Texas Vendor Identification (VID) Number, the date you sent notice to that company, and indicate whether it was responsive or non-responsive to your subcontracting opportunity notice.

Company Name	Texas VID (Do not enter Social Security Numbers.)	Date Notice Sent (mm/dd/yyyy)	Did the HUB Respond?
			☐ - Yes ☐ - No
			☐ - Yes ☐ - No
			☐ - Yes ☐ - No

c. Provide written notification of the subcontracting opportunity you listed in SECTION B-1 to two (2) or more trade organizations or development centers in Texas to assist in identifying potential HUBs by disseminating the subcontracting opportunity to their members/participants. Unless the contracting agency specified a different time period, you must provide your subcontracting opportunity notice to trade organizations or development centers at least seven (7) working days prior to submitting your bid response to the contracting agency. A list of trade organizations and development centers that have expressed an interest in receiving notices of subcontracting opportunities is available on the Statewide HUB Program's webpage at https://www.comptroller.texas.gov/purchasing/vendor/hub/resources.php.

d. List **two (2) trade organizations or development centers** you notified regarding the subcontracting opportunity you listed in SECTION B-1. Include the date when you sent notice to it and indicate if it accepted or rejected your notice.

Trade Organizations or Development Centers	Date Notice Sent (mm/dd/yyyy)	Was the Notice Accepted?
		☐ - Yes ☐ - No
		☐ - Yes ☐ - No

HSP Good Faith Effort - Method B (Attachment B) Cont.

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Enter your company's name here: _____ Requisition #: _____

SECTION B-4: SUBCONTRACTOR SELECTION

Enter the item number and description of the subcontracting opportunity you listed in **SECTION 2, Item b,** of the completed HSP form for which you are completing the attachment.

a. Enter the item number and description of the subcontracting opportunity for which you are completing this Attachment B continuation page.

Item Number: _____ Description: _____

b. List the subcontractor(s) you selected to perform the subcontracting opportunity you listed in **SECTION B-1**. Also identify whether they are a Texas certified HUB and their Texas Vendor Identification (VID) Number or federal Emplioyer Identification Number (EIN), the approximate dollar value of the work to be subcontracted, and the expected percentage of work to be subcontracted. When searching for Texas certified HUBs and verifying their HUB status, ensure that you use the State of Texas' Centralized Master Bidders List (CMBL) - Historically Underutilized Business (HUB) Directory Search located at http://mycpa.cpa.state.tx.us/tpasscmblsearch/index.jsp. HUB status code "**A**" signifies that the company is a Texas certified HUB.

Company Name	Texas certified HUB	Texas VID or federal EIN Do not enter Social Security Numbers. If you do not know their VID / EIN, leave their VID / EIN field blank.	Approximate Dollar Amount	Expected Percentage of Contract
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%

c. If any of the subcontractors you have selected to perform the subcontracting opportunity you listed in **SECTION B-1** is **not** a Texas certified HUB, provide written justification for your selection process (attach additional page if necessary):

REMINDER: As specified in SECTION 4 of the completed HSP form, if you (respondent) are awarded any portion of the requisition, you are required to provide notice as soon as practical to **all** the subcontractors (HUBs and Non-HUBs) of their selection as a subcontractor. The notice must specify at a minimum the contracting agency's name and its point of contact for the contract, the contract award number, the subcontracting opportunity it (the subcontractor) will perform, the approximate dollar value of the subcontracting opportunity and the expected percentage of the total contract that the subcontracting opportunity represents. A copy of the notice required by this section must also be provided to the contracting agency's point of contact for the contract no later than ten (10) working days after the contract is awarded.

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HUB Subcontracting Opportunity Notification Form

In accordance with Texas Gov't Code, Chapter 2161, each state agency that considers entering into a contract with an expected value of $100,000 or more shall, before the agency solicits bids, proposals, offers, or other applicable expressions of interest, determine whether subcontracting opportunities are probable under the contract. The state agency I have identified below in Section B has determined that subcontracting opportunities are probable under the requisition to which my company will be responding.

34 Texas Administrative Code, §20.14 requires all respondents (prime contractors) bidding on the contract to provide notice of each of their subcontracting opportunities to at least three (3) Texas certified HUBs (who work within the respective industry applicable to the subcontracting opportunity), and allow the HUBs at least seven (7) working days to respond to the notice prior to the respondent submitting its bid response to the contracting agency. In addition, at least seven (7) working days prior to submitting its bid response to the contracting agency, the respondent must provide notice of each of its subcontracting opportunities to two (2) or more trade organizations or development centers (in Texas) that serves members of groups (i.e., Asian Pacific American, Black American, Hispanic American, Native American, Woman, Service Disabled Veteran) identified in Texas Administrative Code, §20.11(19)(C).

We respectfully request that vendors interested in bidding on the subcontracting opportunity scope of work identified in Section C, Item 2, reply no later than the date and time identified in Section C, Item 1. Submit your response to the point-of-contact referenced in Section A.

SECTION A: PRIME CONTRACTOR'S INFORMATION

Company Name: _____ State of Texas VID #: _____

Point-of-Contact: _____ Phone #: _____

E-mail Address: _____ Fax #: _____

SECTION B: CONTRACTING STATE AGENCY AND REQUISITION INFORMATION

Agency Name: _____

Point-of-Contact: _____ Phone #: _____

Requisition #: _____ Bid Open Date: _____ (mm/dd/yyyy)

SECTION C: SUBCONTRACTING OPPORTUNITY RESPONSE DUE DATE, DESCRIPTION, REQUIREMENTS AND RELATED INFORMATION

1. Potential Subcontractor's Bid Response Due Date:

If you would like for our company to consider your company's bid for the subcontracting opportunity identified below in Item 2,

we must receive your bid response no later than _____ (Central Time) on _____ (Date (mm/dd/yyyy)).

In accordance with 34 TAC §20.14, each notice of subcontracting opportunity shall be provided to at least three (3) Texas certified HUBs, and allow the HUBs at least seven (7) working days to respond to the notice prior to submitting our bid response to the contracting agency. In addition, at least seven (7) working days prior to us submitting our bid response to the contracting agency, we must provide notice of each of our subcontracting opportunities to two (2) or more trade organizations or development centers (in Texas) that serves members of groups (i.e., Asian Pacific American, Black American, Hispanic American, Native American, Woman, Service Disabled Veteran) identified in Texas Administrative Code, §20.11(19)(C).

(A working day is considered a normal business day of a state agency, not including weekends, federal or state holidays, or days the agency is declared closed by its executive officer. The initial day the subcontracting opportunity notice is sent/provided to the HUBs and to the trade organizations or development centers is considered to be "day zero" and does not count as one of the seven (7) working days.)

2. Subcontracting Opportunity Scope of Work:

3. Required Qualifications: ☐ - Not Applicable

4. Bonding/Insurance Requirements: ☐ - Not Applicable

5. Location to review plans/specifications: ☐ - Not Applicable

Attachment H

2012 Uniform General and Supplementary General Conditions

For

Texas State Technical College Building Construction Contracts

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Article 1. Definitions

Unless the context clearly requires another meaning, the following terms have the meaning assigned herein.

1.1 *Application for Payment* means Contractor's monthly partial invoice for payment that includes any portion of the Work that has been completed for which an invoice has not been submitted and performed in accordance with the requirements of the Contract Documents. The Application for Payment accurately reflects the progress of the Work, is itemized based on the Schedule of Values, bears the notarized signature of Contractor, and shall not include subcontracted items for which Contractor does not intend to pay.

1.2 *Application for Final Payment* means Contractor's final invoice for payment that includes any portion of the Work that has been completed for which an invoice has not been submitted, amounts owing to adjustments to the final Contract Sum resulting from approved change orders, and release of remaining Contractor's retainage.

1.3 *Architect/Engineer (A/E)* means a person registered as an architect pursuant to Tex. Occ. Code Ann., Chapter 1051, as a landscape architect pursuant to Tex. Occ. Code Ann., Chapter 1052, a person licensed as a professional engineer pursuant to Tex. Occ. Code Ann., Chapter 1001, and/or a firm employed by Owner or Design-Build Contractor to provide professional architectural or engineering services and to exercise overall responsibility for the design of a Project or a significant portion thereof, and to perform the contract administration responsibilities set forth in the Contract.

1.4 *Baseline Schedule* means the initial time schedule prepared by Contractor for Owner's information and acceptance that conveys Contractors' and Subcontractors' activities (including coordination and review activities required in the Contract Documents to be performed by A/E and ODR), durations, and sequence of work related to the entire Project to the extent required by the Contract Documents. The schedule clearly demonstrates the critical path of activities, durations and necessary predecessor conditions that drive the end date of the schedule. The Baseline Schedule shall not exceed the time limit current under the Contract Documents.

1.5 *Certificate of Final Completion* means the certificate issued by A/E that documents, to the best of A/E's knowledge and understanding, Contractor's completion of all Contractor's Punchlist items and pre-final Punchlist items, final cleanup and Contractor's provision of Record Documents, operations and maintenance manuals, and all other Close-Out documents required by the Contract Documents.

1.6 *Change Order* means a written modification of the Contract between Owner and Contractor, signed by Owner, Contractor and A/E.

1.7 *Close-Out Documents* mean the product brochures, submittals, product/equipment maintenance and operations instructions, manuals, and other documents/warranties, record documents, affidavit of payment, release of lien and claim, and as may be further defined, identified, and required by the Contract Documents.

1.8 *Contract* means the entire agreement between Owner and Contractor, including all of the Contract Documents.

1.9 *Contract Date* is the date when the agreement between Owner and Contractor becomes effective.

1.10 *Contract Documents* mean those documents identified as a component of the agreement (Contract) between Owner and Contractor. These may include, but are not limited to, Drawings; Specifications; General, Supplementary General, and Special Conditions; and all pre-bid and/or pre-proposal addenda.

1.11 *Contract Sum* means the total compensation payable to Contractor for completion of the Work in accordance with the terms of the Contract.

1.12 *Contract Time* means the period between the start date identified in the Notice to Proceed with construction and the Substantial Completion date identified in the Notice to Proceed or as subsequently amended by a Change Order.

1.13 *Contractor* means the individual, corporation, limited liability company, partnership, firm, or other entity contracted to perform the Work, regardless of the type of construction contract used, so that the term as used herein includes a Construction Manager-at-Risk or a Design-Build firm as well as a general or prime Contractor. The Contract Documents refer to Contractor as if singular in number.

1.14 *Construction Documents* mean the Drawings, Specifications, and other documents issued to build the Project. Construction Documents become part of the Contract Documents when listed in the Contract or any Change Order.

1.15 *Construction Manager-at-Risk*, in accordance with Tex. Educ. Code § 51.782, means a sole proprietorship, partnership, corporation, or other legal entity that assumes the risk for construction, rehabilitation, alteration, or repair of a facility at the contracted price as a general contractor and provides consultation to Owner regarding construction during and after the design of the facility.

1.16 *Date of Commencement* means the date designated in the Notice to Proceed for Contractor to commence the Work.

1.17 *Day* means a calendar day unless otherwise specifically stipulated.

1.18 *Design-Build* means a project delivery method in which the detailed design and subsequent construction is provided through a single contract with a Design-Build firm; a team, partnership, or legal entity that includes design professionals and a builder. The Design-Build Project delivery shall be implemented in accordance with Tex. Educ. Code § 51.780.

1.19 *Drawings* mean that product of A/E which graphically depicts the Work.

1.20 *Final Completion* means the date determined and certified by A/E and Owner on which the Work is fully and satisfactorily complete in accordance with the Contract.

1.21 *Final Payment* means the last and final monetary compensation made to Contractor for any portion of the Work that has been completed and accepted for which payment has not been made, amounts owing to adjustments to the final Contract Sum resulting from approved change orders, and release of Contractor's retainage.

1.22 *Historically Underutilized Business (HUB)* pursuant to Tex. Gov't Code, Chapter 2161, means a business that is at least 51% owned by an Asian Pacific American, a Black American, a Hispanic American, a Native American and/or an American Woman; is an entity with its principal place of business in Texas; and has an owner residing in Texas with proportionate interest that actively participates in the control, operations, and management of the entity's affairs.

1.23 *Notice to Proceed* means written document informing Contractor of the dates beginning Work and the dates anticipated for Substantial Completion.

1.24 *Open Item List* means a list of work activities, Punchlist items, changes or other issues that are not expected by Owner and Contractor to be complete prior to Substantial Completion.

1.25 *Owner* means the State of Texas, and any agency of the State of Texas, acting through the responsible entity of the State of Texas identified in the Contract as Owner.

1.26 *Owner's Designated Representative (ODR)* means the individual assigned by Owner to act on its behalf and to undertake certain activities as specifically outlined in the Contract. ODR is the only party authorized to direct changes to the scope, cost, or time of the Contract.

1.27 *Project* means all activities necessary for realization of Owner's desired building or other structure, including all ancillary and related work. This includes design, contract award(s), execution of the Work itself, work by Owner's forces and/or other contractors, and fulfillment of all Contract and warranty obligations.

1.28 *Progress Assessment Report (PAR)* means the monthly compliance report to Owner verifying compliance with the HUB subcontracting plan (HSP).

1.29 *Proposed Change Order (PCO)* means a document that informs Contractor of a proposed change in the Work and appropriately describes or otherwise documents such change, including Contractor's response of pricing for the proposed change.

1.30 *Punchlist* means a list of items of Work to be completed or corrected by Contractor before Final Completion. Punchlists indicate items to be finished, remaining Work to be performed, or Work that does not meet quality or quantity requirements as required in the Contract Documents.

1.31 *Record Documents* mean the drawing set, Specifications, and other materials maintained by Contractor that documents all addenda, Architect's Supplemental Instructions, Change Orders, and posting and markings that record the as-constructed conditions of the Work and all changes made during construction.

1.32 *Request for Information (RFI)* means a written request by Contractor directed to A/E or ODR for a clarification of the information provided in the Contract Documents or for direction concerning information necessary to perform the Work that may be omitted from the Contract Documents.

1.33 *Samples* mean representative physical examples of materials, equipment, or workmanship used to confirm compliance with requirements and/or to establish standards for use in execution of the Work.

1.34 *Schedule of Values* means the detailed breakdown of the cost of materials, labor, and equipment necessary to accomplish the Work as described in the Contract Documents, submitted by Contractor for approval by Owner and A/E.

1.35 *Shop Drawings* mean the drawings, illustrations, schedules, performance charts, brochures, and other data prepared by Contractor or its agents which detail a portion of the Work.

1.36 *Site* means the geographical area of the location of the Work.

1.37 *Special Conditions* mean the documents containing terms and conditions which may be unique to the Project. Special Conditions are a part of the Contract Documents and have precedence over the Uniform General Conditions and Supplementary General Conditions.

1.38 *Specifications* mean the written product of A/E that establishes the quality and/or performance of products utilized in the Work and processes to be used, including testing and verification for producing the Work.

1.39 *Subcontractor* means a business entity that enters into an agreement with Contractor to perform part of the Work or to provide services, materials or equipment for use in the Work.

1.40 *Submittal Register* means a list provided by Contractor of all items to be furnished for review and approval by A/E and Owner and as identified in the Contract Documents, including anticipated sequence and submittal dates.

1.41 *Substantial Completion* means the date determined and certified by Contractor, A/E, and Owner when the Work, or a designated portion thereof, is sufficiently complete, in accordance with the Contract, so as to be operational and fit for the use intended.

1.42 *Supplementary General Conditions* mean procedures and requirements that modify the Uniform General Conditions. Supplementary General Conditions, when used, have precedence over the Uniform General Conditions.

1.43 *Unit Price Work* means the Work, or a portion of the Work, paid for based on incremental units of measurement.

1.44 *Unilateral Change Order (ULCO)* means a Change Order issued by Owner without the complete agreement of Contractor, as to cost and/or time.

1.45 *Work* means the administration, procurement, materials, equipment, construction and all services necessary for Contractor, and/or its agents, to fulfill Contractor's obligations under the Contract.

1.46 *Work Progress Schedule* means the continually updated time schedule prepared and monitored by Contractor that accurately indicates all necessary appropriate revisions as required by the conditions of the Work and the Project while maintaining a concise comparison to the Baseline Schedule.

Article 2. Wage Rates and Other Laws Governing Construction

2.1 Environmental Regulations. Contractor shall conduct activities in compliance with applicable laws and regulations and other requirements of the Contract relating to the environment and its protection at all times. Unless otherwise specifically determined, Owner is responsible for obtaining and maintaining permits related to stormwater run-off. Contractor shall conduct operations consistent with stormwater run-off permit conditions. Contractor is responsible for all items it brings to the Site, including hazardous materials, and all such items brought to the Site by its Subcontractors and suppliers, or by other entities subject to direction of Contractor. Contractor shall not incorporate hazardous materials into the Work without prior written approval of Owner, and shall provide an affidavit attesting to such in association with request for Substantial Completion inspection.

2.2 Wage Rates. Contractor shall not pay less than the wage scale of the various classes of labor as shown on the prevailing wage schedule provided by Owner in the bid or proposal specifications. Specified wage rates are minimum rates only. Owner is not bound to pay any claims for additional compensation made by any Contractor because the Contractor pays wages in excess of the applicable minimum rate contained in the Contract. The prevailing wage schedule is not a representation that qualified labor adequate to perform the Work is available locally at the prevailing wage rates.

2.2.1 Notification to Workers. Contractor shall post the prevailing wage schedule in a place conspicuous to all workers on the Project Site and shall notify each worker, in writing, of the following as they commence work on the Contract; the worker's job classification, the established minimum wage rate requirement for that classification, as well as the worker's actual wage. The notice must be delivered and signed in acknowledgement of receipt by the worker and must list both the wages and fringe benefits to be paid or furnished for each classification in which the worker is assigned duties. When requested by Owner, Contractor shall furnish evidence of compliance with the Texas Prevailing Wage Law and the addresses of all workers.

2.2.1.1 Contractor shall submit a copy of each worker's wage-rate notification to ODR with the application for progress payment for the period during which the worker was engaged in activities on behalf of the Project.

2.2.1.2 The prevailing wage schedule is determined by Owner in compliance with Tex. Gov't Code, Chapter 2258. Should Contractor at any time become aware that a particular skill or trade not reflected on Owner's prevailing wage schedule will be or is being employed in the Work, whether by Contractor or by Subcontractor, Contractor shall promptly inform ODR of the proposed wage to be paid for the skill along with a justification for same and ODR shall promptly concur with or reject the proposed wage and classification. Contractor is responsible for determining the most appropriate wage for a particular skill in relation to similar skills or trades identified on the prevailing wage schedule. In no case shall any worker by paid less than the wage indicated for laborers.

2.2.2 Penalty for Violation. Contractor, and any Subcontractor, will pay to the State a penalty of sixty dollars ($60.00) for each worker employed for each day, or portion thereof, that the worker is paid less than the wage rates stipulated in the prevailing wage schedule.

2.2.3 Complaints of Violations.

2.2.3.1 Owner's Determination of Good Cause. Upon receipt of information concerning a violation, Owner will conduct an investigation in accordance with Tex. Gov't Code, Chapter 2258 and make an initial determination as to whether good cause exists that a violation occurred. Upon making a good cause finding, Owner will retain the full amounts claimed by the claimant or claimants as the difference between wages paid and wages due under the prevailing wage schedule and any supplements thereto, together with the applicable penalties, such amounts being subtracted from successive progress payments pending a final decision on the violation.

2.2.3.2 No Extension of Time. If Owner's determination proves valid that good cause existed to believe a violation had occurred, Contractor is not entitled to an extension of time for any delay arising directly or indirectly from the arbitration procedures.

2.3 Venue for Suits. The venue for any suit arising from the Contract will be in a court of competent jurisdiction in Travis County or McLennan County, Texas, or as may otherwise be designated in the Supplementary General Conditions.

2.4 Licensing of Trades. Contractor shall comply with all applicable provisions of State law related to license requirements for skilled tradesmen, contractors, suppliers and/or laborers, as necessary to accomplish the Work. In the event Contractor, or one of its Subcontractors, loses its license during the term of performance of the Contract, Contractor shall promptly hire or contract with a licensed provider of the service at no additional cost to Owner.

2.5 Royalties, Patents and Copyrights. Contractor shall pay all royalties and license fees, defend suits or claims for infringement of copyrights and patent rights, and shall hold Owner harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specification or other documents prepared by Owner or A/E. However, if Contractor has reason to believe that the required design, process, or product is an infringement of a copyright or patent, Contractor shall be responsible for such loss unless such information is promptly furnished to A/E.

2.6 State Sales and Use Taxes. Owner qualifies for exemption from certain State and local sales and use taxes pursuant to the provisions of the Tex. Tax Code, Chapter 151. Upon request from Contractor, Owner shall furnish evidence of tax exempt status. Contractor may claim exemption from payment of certain applicable State taxes by complying with such procedures as prescribed by the State Comptroller of Public Accounts. Owner acknowledges not all items

qualify for exemption. Owner is not obligated to reimburse Contractor for taxes paid on items that qualify for tax exemption.

Article 3. General Responsibilities of Owner and Contractor

3.1 Owner's General Responsibilities. Owner is the entity identified as such in the Contract and referred to throughout the Contract Documents as if singular in number.

3.1.1 Preconstruction Conference. Prior to, or concurrent with, the issuance of Notice to Proceed with construction, a conference will be convened for attendance by Owner, Contractor, A/E and appropriate Subcontractors. The purpose of the conference is to establish a working understanding among the parties as to the Work, the operational conditions at the Project Site, and general administration of the Project. Topics include communications, schedules, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, maintain required records and all other matters of importance to the administration of the Project and effective communications between the Project team members.

3.1.2 Owner's Designated Representative. Prior to the start of construction, Owner will identify Owner's Designated Representative (ODR), who has the express authority to act and bind Owner to the extent and for the purposes described in the various Articles of the Contract, including responsibilities for general administration of the Contract.

3.1.2.1 Unless otherwise specifically defined elsewhere in the Contract Documents, ODR is the single point of contact between Owner and Contractor. Notice to ODR, unless otherwise noted, constitutes notice to Owner under the Contract.

3.1.2.2 All directives on behalf of Owner will be conveyed to Contractor and A/E by ODR in writing.

3.1.2.3 Owner will furnish or cause to be furnished, free of charge, the number of complete sets of the Drawings, Specifications, and addenda as provided in the Supplementary General Conditions or Special Conditions.

3.1.3 Owner Supplied Materials and Information.

3.1.3.1 Owner will furnish to Contractor those surveys describing the physical characteristics, legal description, limitations of the Site, Site utility locations, and other information used in the preparation of the Contract Documents.

3.1.3.2 Owner will provide information, equipment, or services under Owner's control to Contractor with reasonable promptness.

3.1.4 Availability of Lands. Owner will furnish, as indicated in the Contract, all required rights to use the lands upon which the Work occurs. This includes rights-of-way and easements for access and such other lands that are designated for use by Contractor. Contractor shall comply with all Owner identified encumbrances or restrictions specifically related to use of lands so furnished. Owner will obtain and pay for easements for permanent structures or permanent changes in existing facilities, unless otherwise required in the Contract Documents.

3.1.5 Limitation on Owner's Duties.

3.1.5.1 Owner will not supervise, direct, control or have authority over or be responsible for Contractor's means, methods, technologies, sequences or procedures of construction or the safety precautions and programs incident thereto. Owner is not responsible for any failure of Contractor to comply with laws and regulations applicable to the Work. Owner is not responsible for the failure of Contractor to perform or furnish the Work in accordance with the Contract Documents. Except as provided in Section 2.5, Owner is not responsible for the acts or omissions of Contractor, or any of its Subcontractors, suppliers or of any other person or organization performing or furnishing any of the work on behalf of Contractor.

3.1.5.2 Owner will not take any action in contravention of a design decision made by A/E in preparation of the Contract Documents, when such actions are in conflict with statutes under which A/E is licensed for the protection of the public health and safety.

3.2 Role of Architect/Engineer. Unless specified otherwise in the Contract between Owner and Contractor, A/E shall provide general administration services for Owner during the construction phase of the project. Written correspondence, requests for information, and Shop Drawings/submittals shall be directed to A/E for action. A/E has the authority to act on behalf of Owner to the extent provided in the Contract Documents, unless otherwise modified by written instrument, which shall be furnished to Contractor by ODR, upon request.

3.2.1 Site Visits.

3.2.1.1 A/E will make visits to the Site at intervals as provided in the A/E's Contract with Owner, to observe the progress and the quality of the various aspects of Contractor's executed Work and report findings to Owner.

3.2.1.2 A/E has the authority to interpret Contract Documents and inspect the Work for compliance and conformity with the Contract. Except as referenced in Paragraph 3.1.5.2, Owner retains the sole authority to accept or reject Work and issue direction for correction, removal or replacement of Work.

3.2.2 Clarifications and Interpretations. It may be determined that clarifications or interpretations of the Contract Documents are necessary. Upon direction by ODR, such clarifications or interpretations will be provided by A/E consistent with the intent of the Contract Documents. A/E will issue these clarifications with reasonable promptness to Contractor as A/E's supplemental instruction ("ASI") or similar instrument. If Contractor believes that such clarification or interpretation justifies an adjustment in the Contract Sum or the Contract Time, Contractor shall so notify Owner in accordance with the provisions of Article 11.

3.2.3 Limitations on Architect/Engineer Authority. A/E is not responsible for:

3.2.3.1 Contractor's means, methods, techniques, sequences, procedures, safety or programs incident to the Project, nor will A/E supervise, direct, control or have authority over the same;

3.2.3.2 The failure of Contractor to comply with laws and regulations applicable to the furnishing or performing the Work;

3.2.3.3 Contractor's failure to perform or furnish the Work in accordance with the Contract Documents; or

3.2.3.4 Acts or omissions of Contractor, or of any other person or organization performing or furnishing any of the Work.

3.3 Contractor's General Responsibilities. Contractor is solely responsible for implementing the Work in full compliance with all applicable laws and the Contract Documents and shall supervise and direct the Work using the best skill and attention to assure that each element of the work conforms to the Contract requirements. Contractor is solely responsible for all construction means, methods, techniques, safety, sequences, coordination and procedures.

Contractor shall visit the Site before commencing the Work and become familiar with local conditions such as the location, accessibility and general character of the Site and/or building.

3.3.1 Project Administration. Contractor shall provide Project administration for all Subcontractors, vendors, suppliers, and others involved in implementing the Work and shall coordinate administration efforts with those of A/E and ODR in accordance with these general conditions, Division 1 of the Specifications and other provisions of the Contract, as well as outlined in the pre-construction conference.

3.3.1.1 Contractor's Management Personnel. Contractor shall employ a competent person or persons who will be present at the Project Site during the progress of the Work to supervise and oversee the Work. The competent persons are subject to the approval of ODR. Contractor shall not change approved staff

during the course of the Project without the written approval of ODR unless the staff member leaves the employment of Contractor. Contractor shall provide additional quality control, safety and other staff as stated in the Contract Documents.

3.3.3 Labor. Contractor shall provide competent, suitably qualified personnel to survey, lay-out, and construct the Work as required by the Contract Documents and shall maintain good discipline and order at the Site at all times.

3.3.4 Services, Materials and Equipment. Unless otherwise specified, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, and all other facilities, incidentals, and services necessary for the construction, performance, testing, start-up, inspection and completion of the Work.

3.3.5 Contractor General Responsibility. For Owner-furnished equipment or material that will be in the care, custody and control of Contractor, Contractor is responsible for damage or loss.

3.3.6 Non-Compliant Work. Should A/E and/or ODR identify Work as non-compliant with the Contract Documents, A/E and/or ODR shall communicate the finding to Contractor, and Contractor shall correct such Work at no additional cost to Owner. The approval of Work or the failure to find non-compliant Work by either A/E or ODR does not relieve Contractor from the obligation to comply with all requirements of the Contract Documents.

3.3.7 Subcontractors. Contractor shall not employ any Subcontractor, supplier or other person or organization, whether initially or as a substitute, against whom Owner shall have reasonable objection. Owner will communicate such objections in writing within ten (10) days of receipt of Contractor's intent to use such Subcontractor, supplier, or other person or organization. Contractor is not required to employ any Subcontractor, supplier or other person or organization to furnish any of the Work to whom Contractor has reasonable objection. Contractor shall not substitute Subcontractors without the acceptance of Owner.

3.3.7.1 All Subcontracts and supply contracts shall be consistent with and bind the Subcontractor and suppliers to the terms and conditions of the Contract Documents, including provisions of the Contract between Contractor and Owner.

3.3.7.2 Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with

Contractor, and shall require all Subcontractors, suppliers and other persons and organizations performing or furnishing any of the Work to communicate with Owner only through Contractor. Contractor shall furnish to Owner a copy, at Owner's request, of each first-tier subcontract promptly after its execution. Contractor agrees that Owner has no obligation to review or approve the content of such contracts and that providing Owner such copies in no way relieves Contractor of any of the terms and conditions of the Contract, including, without limitation, any provisions of the Contract which require the Subcontractor to be bound to Contractor in the same manner in which Contractor is bound to Owner.

3.3.8 Continuing the Work. Contractor shall carry on the Work and adhere to the progress schedule during all disputes, disagreements, or alternative resolution process with Owner. Contractor shall not delay or postpone any Work because of pending unresolved disputes, disagreements or alternative resolution process, except as Owner and Contractor may agree in writing.

3.3.9 Cleaning. Contractor shall at all times keep the Site and the Work clean and free from accumulation of waste materials or rubbish caused by the construction activities under the Contract. Contractor shall ensure that the entire Project is thoroughly cleaned prior to requesting Substantial Completion inspection and again upon completion of the Project prior to the final inspection.

3.3.10 Acts and Omissions of Contractor, its Subcontractors and Employees. Contractor shall be responsible for acts and omissions of its employees and all Subcontractors, their agents and employees. Owner may, in writing, require Contractor to remove from the Project any of Contractor's or its Subcontractor's employees whom ODR finds to be careless, incompetent, unsafe, uncooperative, disruptive or otherwise objectionable.

3.3.11 Indemnification of Owner. **Contractor covenants and agrees to FULLY INDEMNIFY and HOLD HARMLESS Owner and the elected and appointed officials, employees, directors, volunteers, and representatives of Owner, individually or collectively, from and against any and all costs, claims, liens, damages, losses, expenses, fees, fines, penalties, proceedings, actions, demands, causes of action, liability and suits of any kind and nature, including but not limited to personal or bodily injury, death, or property damage, made upon Owner directly or indirectly arising out of, resulting from, or related to Contractor's activities under this Contract, including any acts or omissions of Contractor or any agent, officer, director, representative, employee, consultant or the Subcontractor of Contractor, and their respective officers, agents, employees, directors and representatives while in the exercise of the performance of the rights or duties under this Contract. The indemnity provided for in this paragraph does not apply to any liability resulting from the negligence of the Owner, its officers or employees,**

separate contractors or assigned contractors, in instances where such negligence causes personal injury, death or property damage. IN THE EVENT CONTRACTOR AND OWNER ARE FOUND JOINTLY LIABLE BY A COURT OF COMPETENT JURISDICTION, LIABILITY WILL BE APPORTIONED COMPARATIVELY IN ACCORDANCE WITH THE LAWS OF THE STATE OF TEXAS, WITHOUT WAIVING ANY GOVERNMENTAL IMMUNITY AVAILABLE TO THE STATE UNDER TEXAS LAW AND WITHOUT WAIVING ANY DEFENSES OF THE PARTIES UNDER TEXAS LAW.

3.3.11.1 The provisions of this indemnification are solely for the benefit of the parties hereto and not intended to create or grant any rights, contractual or otherwise, to any other person or entity.

3.3.11.2 Contractor shall promptly advise Owner in writing of any claim or demand against Owner or against Contractor which involves Owner and known to Contractor and related to or arising out of Contractor's activities under this Contract.

3.3.12 Ancillary Areas. Contractor shall operate and maintain operations and associated storage areas at the Site of the Work in accordance with the following:

3.3.12.1 All Contractor operations, including storage of materials and employee parking upon the Site of Work shall be confined to areas designated by Owner.

3.3.12.2 Contractor may erect, at its own expense, temporary buildings that will remain its property. Contractor shall remove those buildings and associated utility service lines upon completion of the Work, unless Contractor requests and Owner provides written consent that it may abandon such buildings and utilities in place.

3.3.12.3 Contractor shall use only established roadways or construct and use such temporary roadways as may be authorized by Owner. Contractor shall not allow load limits of vehicles to exceed the limits prescribed by appropriate regulations or law. Contractor shall provide protection to road surfaces, curbs, sidewalks, trees, shrubbery, sprinkler systems, drainage structures and other like existing improvements to prevent damage, and shall repair any damage thereto at the expense of Contractor.

3.3.12.4 Owner may restrict Contractor's entry to the site to specifically assigned entrances and routes.

3.3.13 Separate Contracts. Owner reserves the right to award other contracts in connection with the Project under the same or substantially similar contract terms, including those portions related to insurance and waiver of subrogation. Owner reserves the right to perform operations related to the Project with Owner's own forces.

3.3.14 Under a system of separate contracts, the conditions described herein continue to apply except as may be amended by Change Order.

3.3.15 Contractor shall cooperate with other contractors or forces employed on the Project by Owner, including providing access to the Site, integration of activities within Contractor's Work Schedule, and Project information as requested.

3.3.16 Owner shall be reimbursed by Contractor for costs incurred by Owner which are payable to a separate contractor because of delays, improperly timed activities, or defective construction by Contractor. Owner will equitably adjust the Contract by Change Order for costs incurred by Contractor because of delays, improperly time activities, damage to the Work or defective construction by a separate contractor.

Article 4. Historically Underutilized Business (HUB) Subcontracting Plan

4.1 General Description. The purpose of the Historically Underutilized Business (HUB) program is to promote equal business opportunities for economically disadvantaged persons (as defined by Tex. Gov't. Code, Chapter 2161) to contract with the State of Texas in accordance with the goals specified in the State of Texas Disparity Study. The HUB program annual procurement utilization goals are defined in 34 T.A.C. § 20.13 (b).

4.1.1 State agencies are required by statute to make a good faith effort to assist HUBs in participating in contract awards issued by the State. 34 T.A.C. § 20.13(b) outlines the State's policy to encourage the utilization of HUBs in State contracting opportunities through race, ethnic and gender neutral means.

4.1.2 A Contractor who contracts with the State in an amount of $100,000.00 or greater is required to make a good faith effort to award subcontracts to HUBs in accordance with 34 T.A.C. § 20.14(a)(2)(A) by submitting a HUB subcontracting plan within twenty-four (24) hours after the bid or response is due and complying with the HUB subcontracting plan after it is accepted by Owner and during the term of the Contract.

4.2 Compliance with Approved HUB Subcontracting Plan. Contractor, having been awarded this Contract in part by complying with the HUB program statute and rules, hereby covenants to continue to comply with the HUB program as follows:

4.2.1 Prior to adding or substituting a Subcontractor, promptly notify Owner in the event a change is required for any reason to the accepted HUB subcontracting plan.

4.2.2 Conduct the good-faith effort activities required and provide Owner with necessary documentation to justify approval of a change to the approved HUB subcontracting plan.

4.2.3 Cooperate in the execution of a Change Order or such other approval of the change in the HUB subcontracting plans as Contractor and Owner may agree to.

4.2.4 Maintain and make available to Owner upon request business records documenting compliance with the accepted HUB subcontracting plan.

4.2.5 Upon receipt of payment for performance of Work, submit to Owner a compliance report, in the format required by Owner, that demonstrates Contractor's performance of the HUB subcontracting plan.

4.2.6 Promptly and accurately explain and provide supplemental information to Owner to assist in Owner's investigation of Contractor's good-faith effort to fulfill the HUB subcontracting plan and the requirements under 34 T.A.C. § 20.14(a)(1).

4.3 Failure to Demonstrate Good-Faith Effort. Upon a determination by Owner that Contractor has failed to demonstrate a good-faith effort to fulfill the HUB subcontracting plan or any Contract covenant detailed above, Owner may, in addition to all other remedies available to it, report the failure to perform to the Comptroller of Public Accounts, Texas Procurement and Support Services Division, Historically Underutilized Business Program and may bar Contractor from future contracting opportunities with Owner.

Article 5. Bonds and Insurance

5.1 Construction Bonds. Contractor is required to tender to Owner, prior to commencing the Work, performance and payment bonds, as required by Tex. Gov't. Code, Chapter 2253. On Construction Manager-at-Risk and Design-Build Projects, the Owner shall require a security bond, as described in Subsection 5.1.2 below.

5.1.1 Bond Requirements. Each bond shall be executed by a corporate surety or sureties authorized to do business in the State of Texas and acceptable to Owner, on Owner's form, and in compliance with the relevant provisions of the Texas Insurance Code. If any bond is for more than ten (10) percent of the surety's capital and surplus, Owner may require certification that the company has reinsured the excess portion with one or more reinsurers authorized to do business in the State. A reinsurer may not reinsure for more than ten (10) percent of its capital and surplus. If a surety upon a bond loses its authority to do business in the State, Contractor shall, within thirty (30) days after such loss, furnish a replacement bond at no added cost to Owner.

5.1.1.1 A performance bond is required if the Contract Sum is in excess of One Hundred Thousand Dollars ($100,000.00). The performance bond is solely for

the protection of Owner. The performance bond is to be for the Contract Sum to guarantee the faithful performance of the Work in accordance with the Contract Documents. The form of the bond shall be approved by the Office of the Attorney General of Texas. The performance bond shall be effective through Contractor's warranty period.

5.1.1.2 A payment bond is required if the Contract price is in excess of Twenty-Five Thousand Dollars ($25,000.00). The payment bond is to be for the Contract Sum and is payable to Owner solely for the protection and use of payment bond beneficiaries. The form of the bond shall be approved by the Office of the Attorney General of Texas.

5.1.2 Security Bond. The security bond provides protection to Owner if Contractor presents an acceptable guaranteed maximum price ("GMP") to Owner but is unable to deliver the required payment and performance bonds within the time period stated below.

5.1.3 When Bonds Are Due.

5.1.3.1 Security bonds are due before execution of a Construction Manager-at-Risk or Design-Build Contract.

5.1.3.2 Payment and performance bonds are due before execution of a contract on competitively bid or competitively sealed proposal projects or before execution of a GMP proposal on Construction Manager-at-Risk projects or Design-Build projects.

5.1.4 Power of Attorney. Each bond shall be accompanied by a valid power of attorney (issued by the surety company and attached, signed and sealed with the corporate embossed seal, to the bond) authorizing the attorney-in-fact who signs the bond to commit the company to the terms of the bond, and stating any limit in the amount for which the attorney can issue a single bond.

5.1.5 Bond Indemnification. The process of requiring and accepting bonds and making claims thereunder shall be conducted in compliance with Tex. Gov't Code, Chapter 2253. IF FOR ANY REASON A STATUTORY PAYMENT OF PERFORMANCE BOND IS NOT HONORED BY THE SURETY, CONTRACTOR SHALL FULLY INDEMNIFY AND HOLD OWNER HARMLESS OF AND FROM ANY COSTS, LOSSES, OBLIGATIONS OR LIABILITIES IT INCURS AS A RESULT.

5.1.6 Furnishing Bond Information. Owner shall furnish certified copies of the payment bond and the related Contract to any qualified person seeking compies who complies with Tex. Gov't. Code § 2253.026.

5.1.7 Claims on Payment Bonds. Claims on payment bonds must be sent directly to Contractor and his surety in accordance with Tex. Gov't. Code § 2253.041. All payment bond claimants are cautioned that no lien exists on the funds unpaid to Contractor on such Contract, and that reliance on notices sent to Owner may result in loss of their rights against Contractor and/or his surety. Owner is not responsible in any manner to a claimant for collection of unpaid bills, and accepts no such responsibility because of any representation by any agent or employee.

5.1.8 Payment Claims when Payment Bond not Required. The rights of Subcontractors regarding payment are governed by Tex. Prop. Code §§ 53.231-53.239 when the value of the Contract between Owner and Contractor is less than Twenty-Five Thousand Dollars ($25,000.00). These provisions set out the requirements for filing a valid lien on funds unpaid to Contractor as of the time of filing the claim, actions necessary to release the lien, and satisfaction of such claim.

5.1.9 Sureties. A surety shall be listed on the U.S. Department of the Treasury's Listing of Approved Sureties maintained by the Bureau of Financial Management Service (FMS), www.fms.gov/c570, stating companies holding Certificates of Authority as acceptable sureties on Federal bonds and acceptable reinsuring companies (FMS Circular 570).

5.2 Insurance Requirements. Contractor shall carry insurance in the types and amounts indicated in this Article for the duration of the Contract. The required insurance shall include coverage for Owner's property prior to construction, during construction and during the warranty period. The insurance shall be evidenced by delivery to Owner of certificates of insurance executed by the insurer or its authorized agent stating coverages, limits, expiration dates and compliance will all applicable required provisions. Upon request, Owner, and/or its agents, shall be entitled to receive without expense, copies of the policies and all endorsements. Contractor shall update all expired policies prior to submission for monthly payment. Failure to update policies shall be reason for withholding of payment until renewal is provided to Owner.

5.2.1 Contractor, consistent with its status as an independent contractor, shall provide and maintain all insurance coverage with the minimum amounts described below until the end of the warranty period unless otherwise stated in Owner's Supplementary General Conditions or Special Conditions. Failure to maintain insurance coverage, as required, is grounds for suspension of Work for cause pursuant to Article 14. The Contractor will be notifies of the date on which the Builder's Risk insurance policy may be terminated by any means deemed appropriate by Owner.

5.2.2 Coverage shall be written on an occurrence basis by companies authorized and admitted to do business in the State of Texas and rated A-, VII or better by A.M. Best Company or similar rating company or otherwise acceptable to Owner.

5.2.2.1 Insurance Coverage Required.

5.2.2.1.1 Workers' Compensation. Insurance with limits as required by the Texas Workers' Compensation Act and Employer's Liability Insurance with limits of not less than:

$1,000,000.00 each accident;

$1,000,000.00 disease each employee; and

$1,000,000.00 disease policy limit.

Policies must include (a) Other States Endorsement to include Texas if business is domiciled outside the State of Texas, and (b) a waiver of all rights of subrogation in favor of Owner.

5.2.2.1.2 Commercial General Liability Insurance, including premises, operations, independent contractor's liability, products and completed operations and contractual liability, covering, but not limited to, the liability assumed under the indemnification provisions of this Contract, fully insuring Contractor's (or Subcontractor's) liability for bodily injury (including death) and property damage with a minimum limit of:

$1,000,000.00 per occurrence;

$2,000,000.00 general aggregate;

$2,000,000.00 products and completed operations aggregate; and

Coverage shall be on an "occurrence" basis.

The policy shall include coverage extended to apply to completed operations and explosion, collapse, and underground hazards. The policy shall include endorsement CG2503 Amendment of Aggregate Limits of Insurance (per project) or its equivalent.

If the Work involves any activities within fifty (50) feet of any railroad, railroad protective insurance as may be required by the affected railroad, written for not less than the limits required by such railroad.

5.2.2.1.3 Asbestos Abatement Liability Insurance, including coverage for liability arising from the encapsulation, removal, handling, storage, transportation, and disposal of asbestos containing materials, if the Work or the Project includes asbestos containing materials.

The combined single limit for bodily injury and property damage will be a minimum of $1,000,000.00 per occurrence.

Specific requirement for claims-made form: Required period of coverage will be determined by the following formula: continuous coverage for life of the Contract, plus one (1) year (to provide coverage for the warranty period), and an extended discovery period for a minimum of five (5) years which shall begin at the end of the warranty period.

Employer's liability limits for asbestos abatement will be:

$1,000,000.00 each accident;

$1,000,000.00 disease each employee; and

$1,000,000.00 disease policy limit.

If this Contract is for asbestos abatement only, the All-Risk Builder's Risk or All-Risk Installation Floater is not required.

Article 6. Construction Documents, Coordination Documents, and Record Documents

6.1 Drawings and Specifications.

6.1.1 Copies Furnished. Contractor will be furnished, free of charge, the number of complete sets of the Drawings, Specifications and addenda as provided in the Supplementary General Conditions or Special Conditions. Additional complete sets of Drawings and Specifications, if requested, will be furnished at reproduction cost to the entity requesting such additional sets. Electronic copies of such documents will be provided to Contractor without charge.

6.1.2 Ownership of Drawings and Specifications. All Drawings, Specifications and copies thereof furnished by A/E are to remain A/E's property. These documents are not to be used on any other project, and with the exception of the Contract record set and electronic versions needed for warranty operations, are to be returned to the A/E, upon request, following completion of the Work.

6.1.3 Interrelation of Documents. The Contract Documents as referenced in the Contract between Owner and Contractor are complementary, and what is required by one shall be as binding as if required by all.

6.1.4 Resolution of Conflicts in Documents. Where conflicts may exist within the Contract Documents, the documents shall govern in the following order: (a) Change Orders, addenda, and written amendments to the Contract; (b) the Contract; (c) Drawings; (d) Specifications (but Specifications shall control over Drawings as to quality of materials and installation); and (e) other Contract Documents. Among other

categories of documents having the same order of precedence, the term or provision that includes the latest date shall control. Contractor shall notify A/E and ODR for resolution of the issue prior to executing the Work in question.

6.1.5 Contractor's Duty to Review Contract Documents. In order to facilitate its responsibilities for completion of the Work in accordance with and as reasonably inferable from the Contract Documents, prior to commencing the Work, Contractor shall examine and compare the Contract Documents, information furnished by Owner, relevant field measurements made by Contractor and any visible or reasonably anticipated conditions at the Site affecting the Work. This duty extends throughout the construction phase prior to commencing each particular work activity and/or system installation.

6.1.6 Discrepancies and Omissions in Drawings and Specifications.

6.1.6.1 Promptly report to ODR and to A/E the discovery of any apparent error, omission or inconsistency in the Contract Documents prior to execution of the Work.

6.1.6.2 It is recognized that Contractor is not acting in the capacity of a licensed design professional, unless it is performing as a Design-Build firm.

6.1.6.3 It is further recognized that Contractor's examination of Contract Documents is to facilitate construction and does not create an affirmative responsibility to detect errors, omissions or inconsistencies or to ascertain compliance with applicable laws, building codes or regulations, unless it is performing as a Design-Build firm or a Construction Manager-at-Risk.

6.1.6.4 When performing as a Design-Build firm, Contractor has sole responsibility for discrepancies, errors, and omissions in the Drawings and Specifications.

6.1.6.5 When performing as a Construction Manager-at-Risk, Contractor has a shared responsibility with A/E for discovery and resolution of discrepancies, errors, and omissions in the Contract Documents. In such case, Contractor's responsibility pertains to review, coordination, and recommendation of resolution strategies within budget constraints.

6.1.6.6 Contractor has no liability for errors, omissions, or inconsistencies unless Contractor knowingly failed to report a recognized problem to Owner or the Work is executed under a Design-Build or Construction Manager-at-Risk Contract as outlined above. Should Contractor fail to perform the examination

and reporting obligations of these provisions, Contractor is responsible for avoidable costs and direct and/or consequential damages.

6.1.6.7 Owner does not warrant or make any representations as to the accuracy, suitability, or completeness of any information furnished to Contractor by Owner or its representatives.

6.2 Requirements for Record Documents. Contractor shall:

6.2.1 Maintain at the Site one copy of all Drawings, Specifications, addenda, approved submittals, Contract modifications, and all Project correspondence, and shall keep current and maintain Drawings and Specifications in good order with postings and markings to record actual conditions of Work and show and reference all changes made during construction. Contractor shall provide Owner and A/E access to these documents at their request.

6.2.2 Maintain the Record Documents which reflect the actual field conditions and representations of the Work performed, whether it be directed by addendum, Change Order, or otherwise. Contractor shall make available the Record Documents and all records prescribed herein for reference and examination by Owner and its representatives and agents.

6.2.3 Update the Record Documents at least monthly prior to submission of periodic partial pay estimates. Failure to maintain current Records Documents constitutes cause for denial of a progress payment otherwise due.

6.2.4 Prior to requesting Substantial Completion inspection, Contractor shall furnish a copy of its marked-up Record Documents and a preliminary copy of each instructional manual, maintenance and operating manual, parts catalogue, wiring diagrams, spare parts, specified service warranties, and like publications, and parts for all installed equipment, systems, and like items as described in the Contract Documents.

6.2.5 Once determined acceptable by ODR with input from A/E, provide one (1) reproducible copy and one (1) electronic media copy in a format acceptable to the ODR of all Record Documents, unless otherwise specified by the Supplementary General Conditions or Special Conditions.

6.2.6 Contractor shall be responsible for updating the Record Documents for all Contractor initiated documents and changes to the Contract Documents due to coordination and actual field conditions, including RFIs.

6.2.7 A/E shall be responsible for updating the Record Documents for any addenda, Change Orders, A/E supplemental instructions and any other alterations to the Contract Documents generated by A/E or Owner.

Article 7. Construction Safety

7.1 General. It is the duty and responsibility of Contractor and all of its Subcontractors to be familiar with, enforce, and comply will all requirements of Public Law No. 91-596, 29 U.S.C. § 651 et. Seq., the Occupational Safety and Health Act of 1970 (OSHA), and all amendments thereto. Contractor shall prepare a safety plan specific to the Project and submit it to ODR and A/E prior to commencing Work. In addition, Contractor and all of its Subcontractors shall comply with all applicable laws and regulations of any public body having jurisdiction for safety of persons or property to protect them from damage, injury, or loss and erect and maintain all necessary safeguards for such safety and protection.

7.2 Notices. Contractor shall provide notices as follows:

7.2.1 Notify owners of adjacent property, including those that own or operate utility services and/or underground facilities, and utility owners, when prosecution of the Work may affect them or their facilities, and cooperate with them in the protection, removal, relocation and replacement, and access to their facilities and/or utilities.

7.2.2 Coordinate the exchange of material safety data sheets (MSDSs) or other hazard communication information required to be made available to or exchanged between or among employers at the Site in connection with laws and regulations. Contractor shall maintain a complete file of MSDSs for all materials in use on the Site throughout the construction phase and make such file available to Owner and its agents as requested.

7.3 Emergencies. In any emergency affecting the safety of persons or property, Contractor shall act to minimize, mitigate, and prevent threatened damage, injury or loss. Contractor shall:

7.3.1 Have authorized agents of Contractor respond immediately upon call at any time of day or night when circumstances warrant the presence of Contractor to protect the Work or adjacent property from damage or to take such action pertaining to the Work as may be necessary to provide for the safety of the public.

7.3.2 Give ODR and A/E prompt notice of all such events.

7.3.3 If Contractor believes that any changes in the Work or variations from Contract Documents have been caused by its emergency response, promptly notify Owner within seventy-two (72) hours of the emergency response event.

7.3.4 Should Contractor fail to respond, Owner is authorized to direct other forces to take action as necessary and Owner my deduct any cost of remedial action from funds otherwise due Contractor.

7.4 Injuries. In the event of an incident or accident involving outside medical care for an individual on or near the Work, Contractor shall notify ODR and other parties as may be directed promptly, but no later than twenty-four (24) hours after Contractor learns that an event required medical care. Contractor shall:

7.4.1 Record the location of the event and the circumstances surrounding it, by using photography or other means, and gather witness statements and other documentation which describes the event.

7.4.2 Supply ODR and A/E with an incident report no later than thirty-six (36) hours after the occurrence of the event. In the event of a catastrophic incident (one fatality or three workers hospitalized), barricade and leave intact the scene of the incident until all investigations are complete. A full set of incident investigation documents, including facts, findings of cause, and remedial plans shall be provided within one (1) week after occurrence, unless otherwise directed by legal counsel. Contractor shall provide ODR with written notification within one week of such catastrophic event if legal counsel delays submission of the full report.

7.5 Environmental Safety. Upon encountering any previously unknown potentially hazardous material, or other materials potentially contaminated by hazardous material, Contractor shall immediately stop work activities impacted by the discovery, secure the affected area, and notify ODR immediately.

7.5.1 Contractor shall bind all Subcontractors to the same duty.

7.5.2 Upon receiving such notice, ODR will promptly engage qualified experts to make such investigations and conduct such tests as may be reasonably necessary to determine the existence or extent of any environmental hazard. Upon completion of this investigation, ODR will issue a written report to Contractor identifying the material(s) found and indicate any necessary steps to be taken to treat, handle, transport or dispose of the material.

7.5.3 Owner may hire third-party contractors to perform any or all such steps.

7.5.4 Should compliance with ODR's instructions result in an increase in Contractor's cost of performance, or delay the Work, Owner will make an equitable adjustment to the Contract Sum and/or the time of completion, and modify the Contract in writing accordingly.

7.6 Trenching Plan. When the Project requires excavation which either exceeds a depth of four (4) feet, or results in any worker's upper body being positioned below grade level, Contractor is required to submit a trenching plan to ODR prior to commencing trenching operations unless an engineered plan is part of the Contract Documents. The plan is required to be prepared and sealed by a professional engineer registered in the State of Texas, and hired or employed by Contractor or Subcontractor to perform the Work. Said engineer cannot be anyone who is otherwise either directly or indirectly engaged on this Project.

Article 8. Quality Control

8.1 Materials and Workmanship. Contractor shall execute Work in a good and workmanlike manner in accordance with the Contract Documents. Contractor shall develop and provide a quality control plan specific to this Project and acceptable to Owner. Where Contract Documents do not specify quality standards, Contractor shall complete and construct all Work in compliance with generally accepted construction industry standards. Unless otherwise specified, Contractor shall incorporate all new materials and equipment into the Work under the Contract.

8.2 Testing.

8.2.1 Owner is responsible for coordinating and paying for routine and special tests required to confirm compliance with quality and performance requirements, except as stated below or otherwise by the Contract Documents.

8.2.2 Contractor shall provide the following testing as well as any other testing required of Contractor by the Specifications:

8.2.2.1 Any test of basic material or fabricated equipment included as part of a submittal for a required item in order to establish compliance with the Contract Documents.

8.2.2.2 Any test of basic material or fabricated equipment offered as a substitute for a specified item on which a test may be required in order to establish compliance with the Contract Documents.

8.2.2.3 Preliminary, start-up, pre-functional and operational testing of building equipment and systems as necessary to confirm operational compliance with requirements of the Contract Documents.

8.2.2.4 All subsequent tests on original or replaced materials conducted as a result of prior testing failure.

8.2.3 All testing shall be performed in accordance with standard test procedures by an accredited laboratory, or special consultant as appropriate, acceptable to Owner. Results of all tests shall be provided promptly to ODR, A/E and Contractor.

8.2.4 Noncompliance (Test Results). Should any of the tests indicate that a material and/or system does not comply with the Contract requirements, the burden of proof remains with Contractor, subject to:

8.2.4.1 Contractor selection and submission of the laboratory for Owner acceptance.

8.2.4.2 Acceptance by Owner of the quality and nature of tests.

8.2.4.3 All tests taken in the presence of A/E and/or ODR, or their representatives.

8.2.4.4 If tests confirm that the material/systems comply with Contract Documents, Owner will pay the cost of the test.

8.2.4.5 If tests reveal noncompliance, Contractor will pay those laboratory fees and costs of that particular test and all future tests, of that failing Work, necessary to eventually confirm compliance with Contract Documents.

8.2.4.6 Proof of noncompliance with the Contract Documents will make Contractor liable for any corrective action which ODR determines appropriate, including complete removal and replacement of noncompliant work or material.

8.2.5 Notice of Testing. Contractor shall give ODR and A/E timely notice of its readiness and the date arranged so that ODR and A/E may observe such inspection, testing or approval.

8.2.6 Test Samples. Contractor is responsible for providing Samples of sufficient size for test purposes and for coordinating such tests with their Work Progress Schedule to avoid delay.

8.2.7 Covering Up Work. If Contractor covers up any Work without providing Owner an opportunity to inspect, Contractor shall, if requested by ODR, uncover and recover the Work at Contractor's expense.

8.3 Submittals.

8.3.1 Contractor's Submittals. Contractor shall submit with reasonable promptness consistent with the Project Schedule and in orderly sequence all Shop Drawings, Samples, or other information required by the Contract Documents, or subsequently required by Change Order. Prior to submitting, Contractor shall review each submittal for general compliance with Contract Documents and approve submittals for review by A/E and Owner by an approval stamp affixed to each copy. Submittal data presented without Contractor's stamp of approval will be returned without review or comment. Any delay resulting from Contractor's failure to certify approval of the Submittal is Contractor's responsibility.

8.3.1.1 Contractor shall within twenty-one (21) days of the effective date of the Notice to Proceed with construction, submit to ODR and A/E a submittal schedule/register, organized by specification section, listing all items to be furnished for review and approval by A/E and Owner. The list shall include Shop Drawings, manufacturer's literature, certificates of compliance, materials Samples, materials colors, guarantees, and all other items identified throughout the Specifications.

8.3.1.2 Contractor shall indicate the type of item, Contract requirements reference, and Contractor's scheduled dates for submitting the item along with the requested dates for approval from A/E and Owner. The Submittal Register shall indicate the projected dates for procurements of all included items and shall be updated at least monthly with actual approval and procurement dates. Contractor's Submittal Register must be reasonable in terms of the review time for complex submittals. Contractor's submittal schedule must be consistent with the Work Progress Schedule and identify critical submittals, and must show and allow a minimum of fifteen (15) days duration after receipt by A/E and ODR for review and approval. If re-submittal is required, an additional fifteen (15) day minimum review time is allowed. Contractor will submit the updated Submittal Register with each request for progress payment. Owner may establish routine review procedures and schedules for submittals at the preconstruction conference and/or elsewhere in the Contract Documents. If Contractor fails to update and provide the Submittal Register as required, Owner may, after seven (7) days notice to Contractor, withhold a reasonable sum of money that would otherwise be due Contractor.

8.3.1.3 Contractor shall coordinate the Submittal Register with the Work Progress Schedule, and not schedule Work requiring a submittal to begin prior to scheduling review and approval of the related submittal. Contractor will revise and/or update both schedules monthly to ensure consistency and current Project data. Contractor will provide to ODR the updated Submittal Register and Work Progress Schedule with each application for progress payment, and will refer to requirements for the Work Progress Schedule for inclusion of procurement activities therein. Regardless, the Submittal Register shall identify dates submitted and returned and shall be used to confirm status and disposition of particular items submitted, including approval or other action taken and other information not conveniently tracked through the Work Progress Schedule.

8.3.1.4 By submitting Shop Drawings, Samples or other required information, Contractor represents that it has determined and verified all applicable field measurements, field construction criteria, materials, catalogue numbers and

similar data, and has checked and coordinated each Shop Drawing and Sample with the requirements of the Work and the Contract Documents.

8.3.2 Review of Submittals. A/E and ODR review is only for conformance with the design concept and the information provided in the Contract Documents. Responses to submittals will be in writing. The approval of a separate item does not indicate approval of an assembly in which the item functions. The approval of a submittal does not relieve Contractor of responsibility for any deviation from the requirements of the Contract unless Contractor informs A/E and ODR of such deviation in a clear, conspicuous and written manner on the submittal transmittal and at the time of submission, obtains Owner's written specific approval of the particular deviation.

8.3.3 Correction and Resubmission. Contractor shall make any corrections required to a submittal and resubmit the required number of corrected copies promptly so as to avoid delay, until submittal approval, and direct attention in writing to A/E and ODR, when applicable, to any new revisions other than the corrections requested on previous submissions.

8.3.4 Limits on Shop Drawing Review. Contractor shall not commence any Work requiring a submittal until review of the submittal under Subsection 8.3.2. Contractor shall construct all such Work in accordance with reviewed submittals. Comments incorporated as part of the review in Subsection 8.3.2 of Shop Drawings and Samples is not authorization to Contractor to perform extra work or changed work unless authorized through a Change Order. A/E's and ODR's review, if any, does not relieve Contractor from responsibility for defects in the Work resulting from errors or omissions of any kind on the submittal, regardless of any approval action.

8.3.5 No Substitutions Without Approval. ODR and A/E may receive and consider Contractor's request for substitution when Contractor agrees to reimburse Owner for review costs and satisfies the requirements of this section. If Contractor does not satisfy these conditions, ODR and A/E will return the request without action except to record noncompliance with these requirements. Owner will not consider the request if Contractor cannot provide the product or method because of failure to pursue the Work promptly or coordinate activities properly. Contractor's request for a substitution may be considered by ODR and A/E when:

8.3.5.1 The Contract Documents do not require extensive revisions; and

8.3.5.2 Proposed changes are in keeping with the general intent of the Contract Documents and the design intent of A/E and do not result in an increase in cost to Owner; and

8.3.5.3 The request is timely, fully documented, properly submitted and one or more of the following apply:

8.3.5.3.1 Contractor cannot provide the specified product, assembly or method of construction within the Contract Time;

8.3.5.3.2 The request directly relates to an "or-equal" clause or similar language in the Contract Documents;

8.3.5.3.3 The request directly relates to a "product design standard" or "performance standard" clause in the Contract Documents;

8.3.5.3.4 The requested substitution offers Owner a substantial advantage in cost, time, energy conservation or other considerations, after deducting additional responsibilities Owner must assume;

8.3.5.3.5 The specified product or method of construction cannot receive approval by an authority having jurisdiction, and ODR can approve the requested substitution;

8.3.5.3.6 Contractor cannot provide the specified product, assembly or method of construction in a manner that is compatible with other materials and where Contractor certifies that the substitution will overcome the incompatibility;

8.3.5.3.7 Contractor cannot coordinate the specified product, assembly or method of construction with other materials and where Contractor certifies they can coordinate the proposed substitution; or

8.3.5.3.8 The specified product, assembly or method of construction cannot provide a warranty required by the Contract Documents and where Contractor certifies that the proposed substitution provides the required warranty.

8.3.6 Unauthorized Substitutions at Contractor's Risk. Contractor is financially responsible for any additional costs or delays resulting from unauthorized substitution of materials, equipment or fixtures other than those specified. Contractor shall reimburse Owner for any increased design or contract administration costs resulting from such unauthorized substitutions.

8.4 Field Mock-Up.

8.4.1 Mock-ups shall be constructed prior to commencement of a specified scope of work to confirm acceptable workmanship.

8.4.1.1 As a minimum, filed mock-ups shall be constructed for roofing systems, exterior veneer/finish systems, glazing systems, and any other Work requiring a mock-up as identified throughout the Contract Documents. Mock-ups for systems not part of the Project scope shall not be required.

8.4.1.2 Mock-ups may be incorporated into the Work if allowed by the Contract Documents and if acceptable to ODR. If mock-ups are freestanding, they shall remain in place until otherwise directed by Owner.

8.4.1.3 Contractor shall include field mock-ups in their Work Progress Schedule and shall notify ODR and A/E of readiness for review sufficiently in advance to coordinate review without delay.

8.5 Inspection During Construction.

8.5.1 Contractor shall provide sufficient, safe, and proper facilities, including equipment as necessary for safe access, at all reasonable times for observation and/or inspection of the Work by Owner and its agents.

8.5.2 Contractor shall not cover up any Work with finishing materials or other building components prior to providing Owner and its agents an opportunity to perform an inspection of the Work.

8.5.2.1 Should corrections of the Work be required for approval, Contractor shall not cover up corrected Work until Owner indicates approval.

8.5.2.2 Contractor shall provide notification of at least five (5) working days or otherwise as mutually agreed, to ODR of the anticipated need for a cover-up inspection. Should ODR fail to make the necessary inspection within the agreed period, Contractor may proceed with cover-up Work, but is not relieved of responsibility for Work to comply with requirements of the Contract Documents.

Article 9. Construction Schedules

9.1 Contract Time. **TIME IS AN ESSENTIAL ELEMENT OF THE CONTRACT.** The Contract Time is the time between the dates indicated in the Notice to Proceed for commencement of the Work and for achieving Substantial Completion. The Contract Time can be modified only by Change Order. Failure to achieve Substantial Completion within the Contract Time or as otherwise agreed to in writing will cause damage to Owner and may subject Contractor to liquidated damages as provided in the Contract Documents. If Contractor fails to achieve Final Completion in a reasonable time after Substantial Completion, Contractor shall be responsible for Owner's damages including, but not limited to, additional inspection, project management, and maintenance cost to the extent caused by Contractor's failure to achieve Final Completion.

9.2 Notice to Proceed. Owner will issue a Notice to Proceed which shall state the dates for beginning Work and for achieving Substantial Completion of the Work.

9.3 Work Progress Schedule. Refer to Supplementary Conditions, Special Conditions and Division 1 of the Specifications for additional schedule requirements. Unless indicated otherwise in those documents, Contractor shall submit its initial Work Progress Schedule for the Work in relation to the entire Project not later than twenty-one (21) days after the effective date of the Notice to Proceed to ODR and A/E. Unless otherwise indicated in the Contract Documents, the Work Progress Schedule shall be computerized Critical Path Method (CPM) with fully editable logic. This initial schedule shall indicate the dates for starting and completing the various aspects required to complete the Work, including mobilization, procurement, installation, testing, inspection, delivery of Close-Out Documents and acceptance of the Work of the Contract. When acceptable to Owner, the initially accepted schedule shall be the Baseline Schedule for comparison to actual conditions throughout the Contract Duration.

Note: This article pertains to construction phase schedules. Additional requirements for design phase scheduling for Construction Manager-at-Risk and Design-Build contracts are outlined in Division 1 Project Planning and Scheduling Specifications.

9.3.1 Schedule Requirements. Contractor shall submit electronic and paper copy of the initial Work Progress Schedule reflecting accurate and reliable representations of the planned progress of the Work, the Work to date if any, and Contractor's actual plans for its completion. Contractor shall organize and provide adequate detail so the schedule is capable of measuring and forecasting the effect of delaying events on completed and uncompleted activities.

9.3.1.1 Contractor shall resubmit the initial schedule as required to address review comments from A/E and ODR until such schedule is accepted as the Baseline Schedule.

9.3.1.2 Submittal of a schedule, schedule revision or schedule update constitutes Contractor's representation to Owner of the accurate depiction of all progress to date and that Contractor will follow the schedule as submitted in performing the Work.

9.3.2 Schedule Updates. Contractor shall update the Work Progress Schedule and the Submittal Register monthly, as a minimum, to reflect progress to date and current plans for completing the Work, while maintaining the original schedule as Baseline Schedule, and shall submit paper and electronic copies of the update to A/E and ODR as directed, but as a minimum with each request for payment. Owner has no duty to make progress payments unless accompanied by the updated Work Progress Schedule. The Work Progress Schedule must show the anticipated date of completion reflecting all extensions of time granted through Change Order as of the date of the update. Contractor may

revise the Work Progress Schedule when in Contractor's judgment it becomes necessary for the management of the Work. Contractor shall identify all proposed changes to schedule logic to Owner and A/E via an executive summary accompanying the updated schedule for review prior to final implementation of revisions into a revised Baseline Schedule. Schedule changes that materially impact Owner's operations shall be communicated promptly to ODR and shall not be incorporated into the revised Baseline Schedule without ODR's consent.

9.3.3 The Work Progress Schedule is for Contractor's use in managing the Work and submittal of the schedule, and successive updates or revisions are for the information of Owner and to demonstrate that Contractor has complied with the requirements for planning the Work. Owner's acceptance of a schedule, schedule update or revision constitutes Owner's agreement to coordinate its own activities with Contractor's activities as shown on the schedule.

9.3.3.1 Acceptance of the Work Progress Schedule, or update and/or revision thereto, does not indicate any approval of Contractor's proposed sequences and duration.

9.3.3.2 Acceptance of a Work Progress Schedule update or revision indicating early or late completion does not constitute Owner's consent, alter the terms of the Contract, or waive either Contractor's responsibility for timely completion or Owner's right to damages for Contractor's failure to do so.

9.3.3.3 Contractor's scheduled dates for completion of any activity or the entire Work do not constitute a change in terms of the Contract. Change Orders are the only method of modifying the Substantial Completion Date(s) and Contract Time.

9.4 Ownership of Float. Unless otherwise indicated in the Contract Documents, Contractor shall develop its schedule, pricing, and execution plan to provide a minimum of ten (10) percent total float at acceptance of the Baseline Schedule. Float time contained in the Work Progress Schedule is not for the exclusive benefit of Contractor or Owner, but belongs to the Project and may be consumed by either party. Before Contractor uses any portion of the float, Contractor must submit a written request to do so to the Owner and receive Owner's written authorization to use the float. Owner's approval shall not be unreasonably withheld.

9.5 Completion of Work. Contractor is accountable for completing the Work within the Contract Time stated in the Contract, or as otherwise amended by Change Order.

9.5.1 If, in the judgment of Owner, the Work is behind schedule and the rate of placement of Work is inadequate to regain scheduled progress to insure timely completion of the entire Work or a separable portion thereof, Contractor, when so

informed by Owner, shall immediately take action to increase the rate of Work placement by:

9.5.1.1 An increase in working forces;

9.5.1.2 An increase in equipment or tools;

9.5.1.3 An increase in hours of work or number of shifts;

9.5.1.4 The expedited delivery of materials; and/or

9.5.1.5 Other action proposed if acceptable to Owner.

9.5.2 Within ten (10) days after such notice from ODR, Contractor shall notify ODR in writing of the specific measures taken and/or planned to increase the rate of progress. Contractor shall include an estimate as to the date of scheduled progress recovery and an updated Work Progress Schedule illustrating Contractor's plan for achieving timely completion of the Project. Should ODR deem the plan of action inadequate, Contractor shall take additional steps or make adjustments as necessary to its plan of action until it meets with ODR's approval.

9.6 Modification of the Contract Time.

9.6.1 Delays and extensions of time as hereinafter described are valid only if executed in accordance with provisions set forth in Article 11.

9.6.2 When a delay defined herein as excusable prevents Contractor from completing the Work within the Contract Time, Contractor is entitled to an extension of time. Owner will make an equitable adjustment and extend the number of days lost because of excusable delay or Weather Days, as measure by Contractor's Progress Schedule. All extensions of time will be granted in calendar days. In no event, however, will an extension of time be granted for delays that merely extend the duration of non-critical activities, or which only consume float without delaying the Project's Substantial Completion date(s).

9.6.2.1 A "Weather Day" is a day on which Contractor's current schedule indicates Work is to be done, and on which inclement weather and related Site conditions prevent Contractor from performing seven (7) hours of Work between the hours of 7:00 a.m. and 6:00 p.m. Weather Days are excusable delays. When weather conditions at the Site prevent Work from proceeding, Contractor shall immediately notify ODR for confirmation of the conditions. At the end of each calendar month, Contractor shall submit to ODR and A/E a list of Weather Days occurring in that month, along with documentation of the impact on critical activities. Based on confirmation by ODR, any time extension granted will be

issued by Change Order. If Contractor and Owner cannot agree on the time extension, Owner may issue a ULCO for fair and reasonable time extension.

9.6.2.2 Excusable Delay. Contractor is entitled to an equitable adjustment of the Contract Time, issued via Change Order, for delays caused by the following:

9.6.2.2.1 Errors, omissions, and imperfections in design, which A/E corrects by means of changes in the Drawings and Specifications.

9.6.2.2.2 Unanticipated physical conditions at the Site, which A/E corrects by means of changes to the Drawings and Specifications or for which ODR directs changes in the Work identified in the Contract Documents.

9.6.2.2.3 Changes in the Work that affect activities identified in Contractor's schedule as "critical" to completion of the entire Work, if such changes are ordered by ODR or recommended by A/E and ordered by ODR.

9.6.2.2.4 Suspension of Work for unexpected natural events (sometimes called "acts of God"), civil unrest, strikes or other events which are not within the reasonable control of Contractor.

9.6.2.2.5 Suspension of Work, for convenience of ODR, which prevents Contractor from completing the Work within the Contract Time.

9.6.3 Contractor's relief in the event of such delays is the time impact to the critical path as determined by analysis of Contractor's schedule. In the event that Contractor incurs additional costs because of the excusable delays other than described in Subparagraph 9.6.2.2.4 and within the reasonable control of Owner, the Contract price and Contract Time are to be equitably adjusted by Owner pursuant to the provisions of Article 11.

9.7 No Damages for Delay.. An extension of the Contract Time shall be the sole remedy of Contractor for delays in performance of the Work, whether or not such delays are foreseeable, except for delays caused solely by acts of Owner that constitute intentional interference with Contractor's performance of the Work and then only to the extent such acts continue after Contractor notifies Owner in writing of such interference. For delays caused by act(s) other than the sole intentional interference of Owner, Contractor shall not be entitled to any compensation or recovery of any damages including, without limitation, consequential damages, lost opportunity costs, impact damages, loss of productivity, or other similar damages.

Owner's exercise of any of its rights or remedies under the Contract including, without limitation, ordering changes in the Work or directing suspension, rescheduling, or correction of the Work, shall not be construed as intentional interference with Contractor's performance of the Work, regardless of the extent or frequency of Owner's exercise of such rights or remedies.

9.8 Concurrent Delay. When the completion of the Work is simultaneously delayed by an excusable delay or a delay arising from a cause not designated as excusable, Contractor may not be entitled to a time extension for the period of concurrent delay.

9.9 Other Time Extension Requests. Time extensions requested in association with changes to the Work directed or requested by Owner shall be included with Contractor's proposed costs for such change. Time extensions requested for inclement weather are covered by Paragraph 9.6.2.1 above. If Contractor believes that the completion of the Work is delayed by a circumstance other than for changes directed to the Work or weather, they shall give ODR written notice, stating the nature of the delay and the activities potentially affected, within five (5) days after the onset of the event or circumstance giving rise to the excusable delay. Contractor shall provide sufficient written evidence to document the delay. In the case of a continuing cause or delay, only one notice of claim is necessary. Contractor shall state claims for extensions of time in numbers of whole or half days.

9.9.1 Within ten (10) days after the cessation of the delay, Contractor shall formalize its request for extension of time in writing to include a full analysis of the schedule impact of the delay and substantiation of the excusable delay. All changes to the Contract Time or made as a result of such claims is by Change Order, as set forth in Article 11.

9.9.2 No extension of time releases Contractor or the Surety furnishing a performance or payment bond from any obligations under the Contract or such bond. Those obligations remain in full force until discharge of the Contract.

9.9.3 Contents of Time Extension Requests. Contractor shall provide with each Time Extension Request a quantitative demonstration or description of the impact of the delay on Project completion time, based on the Work Progress Schedule. Contractor shall include with Time Extension Requests a reasonably detailed narrative setting forth:

9.9.3.1 The nature of the delay and its cause and the basis of Contractor's claim of entitlement to a time extension.

9.9.3.2 Documentation of the actual impacts of the claimed delay on the critical path indicated in Contractor's Work Progress Schedule, and any concurrent delays.

9.9.3.3 Description and documentation of steps taken by Contractor to mitigate the effect of the claimed delay, including, when appropriate, the modification of the Work Progress Schedule.

9.9.4 Owner's Response. Owner will respond to the Time Extension Request by providing to Contractor written notice of the number of days granted, if any, and giving its reason if this number differs from the number of days requested by Contractor.

9.9.4.1 Owner will not grant time extensions for delays that do not affect the Contract Substantial Completion date.

9.9.4.2 Owner will respond to each properly submitted Time Extension Request within fifteen (15) days following receipt. If Owner cannot reasonably make a determination about Contractor's entitlement to a time extension within that time, Owner will notify Contractor in writing. Unless otherwise agreed by Contractor, Owner has no more than fifteen (15) additional days to prepare a final response. If Owner fails to respond within forty-five (45) days from the date the Time Extension Request is received, Contractor's request for a time extension shall be deemed rejected by Owner.

9.10 Failure to Complete Work Within the Contract Time. **TIME IS AN ESSENTIAL ELEMENT OF THE CONTRACT.** Contractor's failure to substantially complete the Work within the Contract Time or to achieve Substantial Completion as required will cause damage to Owner. These damages may be liquidated by agreement of Contractor and Owner, in the amount per day as set forth in the Contract Documents.

9.11 Liquidated Damages. Owner may collect liquidated damages due from Contractor directly or indirectly by reducing the Contract Sum in the amount of liquidated damages stated in the Supplementary General Conditions or Special Conditions.

Article 10. Payments

10.1 Schedule of Values. Contractor shall submit to ODR and A/E for acceptance a Schedule of Values accurately itemizing material and labor for the various classifications of the Work based on the organization of the specification sections and of sufficient detail acceptable to ODR. The accepted Schedule of Values will be the basis for the progress payments under the Contract.

10.1.1 No progress payments will be made prior to receipt and acceptance of the Schedule of Values, provided in such detail as required by ODR, and submitted not less than twenty-one (21) days prior to the first request for payment. The Schedule of Values shall follow the order of trade divisions of the Specifications and include itemized costs for general conditions, costs for preparing Close-Out Documents, fees, contingencies, and

Owner cash allowances, if applicable, so that the sum of the items will equal the Contract price. As appropriate, Contractor will assign each item labor and/or material values, the subtotal thereof equaling the value of the Work in place when complete.

10.1.1.1 Owner requires that the Work items be inclusive of the cost of the Work items only. Any contract markups for overhead and profit, general conditions, etc., shall be contained within separate line items for those specific purposes which shall be divided into at least two (2) lines, one (1) for labor and one (1) for materials.

10.1.2 Contractor shall retain a copy of all worksheets used in preparation of its bid or proposal, supported by a notarized statement that the worksheets are true and complete copies of the documents used to prepare the bid or proposal. Contractor shall make the worksheets available to ODR at the time of Contract execution. Thereafter, Contractor shall grant Owner during normal business hours access to said copy of worksheets at any time during the period commencing upon execution of the Contract and ending one year after final payment.

10.2 Progress Payments. Contractor will receive periodic progress payments for Work performed, materials in place, suitably stored on Site, or as otherwise agreed to by Owner and Contractor. Payment is not due until receipt by ODR or his designee of a correct and complete Pay Application in electronic and/or hard copy format as set forth in Supplementary General Conditions, Special Conditions, and certified by A/E. Progress payments are made provisionally and do not constitute acceptance of work not in accordance with the Contract Documents. Owner will not process progress payment applications for Change Order Work until all parties execute the Change Order.

10.2.1 Preliminary Pay Worksheet. Once each month that a progress payment is to be requested, the Contractor shall submit to A/E and ODR a complete, clean copy of a preliminary pay worksheet or preliminary pay application, to include the following:

10.2.1.1 Contractor's estimate of the amount of Work performed, labor furnished, and materials incorporated into the Work, using the established Schedule of Values;

10.2.1.2 An updated Work Progress Schedule including the executive summary and all required schedule reports;

10.2.1.3 HUB subcontracting plan Progress Assessment Report as required in Paragraph 4.2.5.1;

10.2.1.4 Such additional documentation as Owner may require as set forth in the Supplementary General Conditions or elsewhere in the Contract Documents; and

10.2.1.5 Construction payment affidavit.

10.2.2 Contractor's Application for Payment. As soon as practicable, but in no event later than seven (7) days after receipt of the preliminary pay worksheet, A/E and ODR will meet with Contractor to review the preliminary pay worksheet and to observe the condition of the Work. Based on this review, ODR and A/E may require modifications to the preliminary pay worksheet prior to the submittal of an Application for Payment, and will promptly notify Contractor of revisions necessary for approval. As soon as practicable, Contractor shall submit its Application for Payment on the appropriate and completed form, reflecting the required modifications to the Schedule of Values required by A/E and/or ODR. Contractor shall attach all additional documentation required by ODR and/or A/E, as well as an affidavit affirming that all payrolls, bills for labor, materials, equipment, subcontracted work and other indebtedness connected with Contractor's Application for Payment are paid or will be paid within the time specified in Tex. Gov't Code, Chapter 2251. No Application for Payment is complete unless it fully reflects all required modifications, and attaches all required documentation including Contractor's affidavit.

10.2.3 Certification by Architect/Engineer. Within five (5) days or earlier following A/E's receipt of Contractor's formal Application for Payment, A/E will review the Application for Payment for completeness and forward it to ODR. A/E will certify that the application is complete and payable, or that it is incomplete, stating in particular what is missing. If the Application for Payment is incomplete, Contractor shall make the required corrections and resubmit the Application for Payment for processing.

10.3 Owner's Duty to Pay. Owner has no duty to pay Contractor except on receipt by ODR of: 1) a complete Application for Payment certified by A/E; 2) Contractor's updated Work Progress Schedule; and 3) confirmation that Contractor has maintained and updated the Record Documents kept at the Site.

10.3.1 Payment for stored materials and/or equipment confirmed by Owner and A/E to be on-site or otherwise properly stored is limited to eighty-five percent (85%) of the scheduled value for the materials or equipment, whichever is less.

10.3.2 Retainage. Owner will withhold from each progress payment, as retainage, five percent (5%) of the total earned amount, the amount authorized by law, or as otherwise set forth in the Supplementary General Conditions or Special Conditions. Retainage is managed in conformity with Tex. Gov't Code, Chapter 2252, Subchapter B.

10.3.2.1 Contractor shall provide written consent of its Surety for any request for reduction or release of retainage.

10.3.2.2 At least sixty-five percent (65%) of the Contract or such other discrete Work phase as set forth in Subsection 12.1.6 or Work package delineated in the Contract Documents must be completed before Owner can consider a retainage reduction or release.

10.3.2.3 Contractor shall not withhold retainage from their Subcontractors and suppliers in amounts that are any percentage greater than that withheld in its Contract with Owner under this subsection, unless otherwise acceptable to Owner.

10.3.3 Price Reduction to Cover Loss. Owner may reduce any Application for Payment, prior to payment to the extent necessary to protect Owner from loss on account of actions of Contractor including, but not limited to, the following:

10.3.3.1 Defective or incomplete Work not remedied;

10.3.3.2 Damage to Work of a separate Contractor;

10.3.3.3 Failure to maintain scheduled progress or reasonable evidence that the Work will not be completed within the Contract Time;

10.3.3.4 Persistent failure to carry out the Work in accordance with the Contract Documents;

10.3.3.5 Reasonable evidence that the Work cannot be completed for the unpaid portion of the Contract Sum;

10.3.3.6 Assessment of fines for violations of prevailing wage rate law; or

10.3.3.7 Failure to include the appropriate amount of retainage for that periodic progress payment.

10.3.4 Title to all material and Work covered by progress payments transfers to Owner upon payment.

10.3.4.1 Transfer of title to Owner does not relieve Contractor and its Subcontractors of the sole responsibility for the care and protection of materials and Work upon which payments have been made until final acceptance, or the restoration of any damaged Work, or waive the right of Owner to require the fulfillment of all the terms of the Contract.

10.4 Progress Payments. Progress payments to Contractor do not release Contractor or its Surety from any obligations under the Contract.

10.4.1 Upon Owner's request, Contractor shall furnish manifest proof of the status of Subcontractor's accounts in a form acceptable to Owner.

10.4.2 Pay estimate certificates must be signed by a corporate officer or a representative duly authorized by Contractor.

10.4.3 Contractor must provide copies of bills of lading, invoices, delivery receipts or other evidence of the location and value of such materials in requesting payment for materials.

10.4.4 For purposes of Tex. Gov't. Code, § 2251.021(a)(2), the date the performance of service is complete is the date when ODR approves the Application for Payment.

10.5 Off-Site Storage. With prior approval by Owner and in the event Contractor elects to store materials at an off-site location, Contractor must abide by the following conditions unless otherwise agreed in writing by Owner:

10.5.1 Store materials in a commercial warehouse meeting the criteria stated below.

10.5.2 Provide insurance coverage adequate not only to cover materials while in storage, but also in transit from the off-site storage areas to the Project Site. Copies of duly authenticated certificates of insurance, made out to insure Texas State Technical College Waco must be filed with Owner's representative.

10.5.3 Inspection by Owner's representative is allowed at any time. Owner's inspectors must be satisfied with security, control, maintenance and preservation measures.

10.5.4 Materials for this Project are physically separated and marked for the Project in a sectioned-off area. Only materials which have been approved through the submittal process are to be considered for payment.

10.5.5 Owner reserves the right to reject materials at any time prior to final acceptance of the complete Contract if those materials do not meet Contract requirements, regardless of any previous progress payment made.

10.5.6 With each monthly payment estimate, submit a report to ODR and A/E listing the quantities of materials already paid for and still stored in the off-site locations.

10.5.7 Make warehouse records, receipts and invoices available to Owner's representatives, upon request, to verify the quantities and their disposition.

10.5.8 In the event of Contract termination or default by Contractor, the items in storage off-site, upon which payment has been made, will be promptly turned over to Owner or Owner's agents at a location near the jobsite as directed by ODR. The full provisions of performance and payment bonds on this Project cover the materials off-site in every respect as though they were stored on the Project Site.

10.6 Time for Payment by Contractor Pursuant to Tex. Gov't Code § 2255.022

10.6.1 Contractor who receives a payment from a governmental entity shall pay Subcontractor the appropriate share of the payment not later than the tenth (10th) day after the date the Contractor receives payment.

10.6.2 The appropriate share is overdue on the eleventh (11th) day after the date the Contractor receives the payment.

Article 11. Changes

11.1 Change Orders. A Change Order issued after execution of the Contract is a written order to Contractor, signed by the Vice President of Administrative and Financial Services at Texas State Technical College Waco, Contractor, and A/E, authorizing a change in the Work or an adjustment in the Contract Sum or Contract Time. The Contract Sum and the Contract Time can only be changed by Change Order. A Change Order signed by Contractor indicates his agreement therewith, including the adjustment in the Contract Sum and/or the Contract Time. The Vice President of Administrative and Financial Services may issue a written authorization for Contractor to proceed with Work of a Change Order in advance of final execution by all parties in accordance with Section 11.9.

11.1.1 Owner, without invalidating the Contract and without approval of Contractor's Surety, may order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, and the Contract Sum and the Contract Time will be adjusted accordingly. All such changes in the Work shall be authorized by Change Order or ULCO, and shall be performed under the applicable conditions of the Contract Documents. If such changes cause an increase or decrease in Contractor's cost of, or time required for, performance of the Contract, an equitable adjustment shall be made and confirmed in writing in a Change Order or ULCO.

11.1.2 Owner and Contractor acknowledge and agree that the Specifications and Drawings may not be complete or free from errors, omissions and imperfections and that they may require changes or additions in order for the Work to be completed to the satisfaction of Owner, therefore, any minor errors, omissions or imperfections in the Specifications or Drawings, or any changes in or additions to the Specifications or Drawings to correct minor errors or omissions or the Work ordered by Owner shall not constitute or give rise to any claim, demand or cause of action of any nature whatsoever

in favor of Contractor, whether for breach of Contract or otherwise. However, should the nature of the errors or omissions necessitate substantial changes in the Work such that a Change Order is appropriate, Owner shall be liable to Contractor for the sum stated to be due Contractor in any Change Order approved and signed by both parties. The sum established in any Change Order, together with any extension of time contained in said Change Order, shall constitute full compensation to Contractor for all costs, expenses and damages to Contractor for the changes in the Work described in the Change Order, as permitted under Tex. Gov't Code, Chapter 2260.

11.1.3 Procedures for administration of Change Orders shall be established by Owner and stated in Supplementary General Conditions, Special Conditions, or elsewhere in the Contract Documents.

11.1.4 No verbal order, verbal statement, or verbal direction of Owner or his duly appointed representative shall be treated as a change under this article or entitle Contractor to an adjustment.

11.1.5 Contractor agrees that Owner or any of its duly authorized representatives shall have access and the right to examine any directly pertinent books, documents, papers, and records of Contractor. Further, Contractor agrees to include in all its subcontracts a provision to the effect that Subcontractor agrees that Owner or any of its duly authorized representatives shall have access to and the right to examine any directly pertinent books, documents, papers and records of said Subcontractor relating to any claim arising from the Contract, whether or not the Subcontractor is a party to the claim. The period of access and examination described herein which relates to appeals under the Disputes article of the Contract, litigation, or the settlement of claims arising out of the performance of the Contract shall continue until final disposition of such claims, appeals, or litigation.

11.2 Unit Prices. If unit prices are stated in the Contract Documents or subsequently agreed upon and if the quantities originally contemplated in setting the unit prices are so changed in a Proposed Change Order that application of the agreed unit prices to the quantities of Work proposed will cause substantial inequity to Owner or Contractor, the applicable unit prices shall be equitably adjusted as provided in the Supplementary General Conditions or Special Conditions or as agreed to by the parties and incorporated into a Change Order.

11.3 Claims for Additional Costs.

11.3.1 If Contractor wished to make a claim for an increase in the Contract Sum not related to a requested change, it shall give to Owner and A/E written notice thereof within twenty-one (21) days after the occurrence of the event or discovery of any conditions giving rise to such claim. Contractor must notify Owner and A/E before proceeding to execute any Work considered to add additional cost or time, except in an emergency

endangering life or property in which case Contractor shall act in accordance with Subsection 7.2.1, and failure to provide the required notice will invalidate any subsequent notice or claim for additional cost or time from Work. If Owner and Contractor cannot agree on the amount of the adjustment in the Contract Sum, it shall be determined as set forth under Article 15. Any change in the Contract Sum resulting from such claim shall be authorized by a Change Order or a ULCO.

11.3.2 If Contractor claims that additional cost is involved because of, but not limited to, 1) any written interpretation of the Contract Documents, 2) any order by Owner to stop the Work pursuant to Article 14 where Contractor was not at fault, or 3) any written order for a minor change in the Work issued pursuant to Section 11.4, Contractor shall make such claim as provided in Subsection 11.3.1.

11.3.3 Should Contractor or his Subcontractors fail to call attention of A/E to discrepancies or omissions in the Contract Documents, but claim additional costs for corrective Work after Contract award, Owner may assume intent to circumvent competitive bidding for necessary corrective Work. In such case, Owner may choose to let a separate Contract for the corrective Work, or issue a ULCO to require performance by Contractor. Claims for time extensions or for extra cost resulting from the delayed notice of patent Contract Document discrepancies or omissions will not be considered by Owner.

11.4 Minor Changes. A/E, with concurrence of ODR, will have authority to order minor changes in the Work not involving an adjustment in the Contract Sum or an extension of Contract Time. Such changes shall be effected by written order which Contractor shall carry out promptly and record on the Record Documents.

11.5 Concealed Site Conditions. Contractor is responsible for visiting the Site and being familiar with local conditions such as the location, accessibility, and general character of the Site and/or building. If, in the performance of the Contract, subsurface, latent, or concealed conditions at the Site are found to be materially different from the information included in the Contract Documents, or if unknown conditions of an unusual character are disclosed differing materially from the conditions inherent in Work of the character shown and specified, ODR and A/E shall be notified in writing of such conditions before they are disturbed. Upon such notice, or upon its own observation of such conditions, A/E, with the approval of ODR, will promptly make changes in the Drawings and Specifications as they deem necessary to conform to the different conditions, and any increase or decrease in the cost of the Work, or in the time within which the Work is to be completed, resulting from such changes will be adjusted by Change Order, subject to the prior approval of ODR.

11.6 Extension of Time. All changes to the Contract Time shall be made as a consequence of requests as required under Section 9.6, and as documented by Change Order as provided under Section 11.1.

11.7 Administration of Change Order Requests. All changes in the Contract shall be administered in accordance with procedures approved by Owner, and when required, make use of such electronic information management system(s) as Owner may employ.

11.7.1 Routine changes in the construction Contract shall be formally initiated by A/E by means of a Proposed Change Order (PCO) form detailing requirements of the proposed change for pricing by Contractor. This action may be preceded by communications between Contractor, A/E and ODR concerning the need and nature of the change, but such communications shall not constitute a basis for beginning the proposed Work by Contractor. Except for emergency conditions described below, approval of Contractor's cost proposal by A/E and ODR will be required for authorization to proceed with the Work being changed. Owner will not be responsible for the cost of Work changed without prior approval and Contractor may be required to remove Work so installed.

11.7.2 All proposed costs for change order Work must be supported by itemized accounting of material, equipment and associated itemized installation costs in sufficient detail, following the outline and organization of the established Schedule of Values, to permit analysis by A/E and ODR using current estimating guides and/or practices. Photocopies of Subcontractor and vendor proposals shall be furnished unless specifically waived by ODR. Contractor shall provide written response to a change request within twenty-one (21) days of receipt.

11.7.3 Any unexpected circumstance which necessitates an immediate change in order to avoid a delay in progress of the Work may be expedited by verbal communication and authorization between Contractor and Owner, with written confirmation following within twenty-four (24) hours. A limited scope not-to-exceed estimate of cost and time will be requested prior to authorizing Work to proceed. Should the estimate be impractical for any reason, ODR may authorize the use of detailed cost records of such Work to establish and confirm the actual costs and time for documentation in a formal Change Order.

11.7.4 Emergency changes to save life or property may be initiated by Contractor alone (see Section 7.3) with the claimed cost and/or time of such Work to be fully documented as to necessity and detail of the reported costs and/or time.

11.7.5 The method of incorporating approved Change Orders into the parameters of the accepted Schedule of Values must be coordinated and administered in a manner acceptable to ODR.

11.8 Pricing Change Order Work. Adjustments in the Contract Sum and Contract Time resulting from a change in the Work or otherwise authorized by the terms of the Contract shall be determined by mutual agreement of the parties or, in the case of a ULCO, by the Contractor's cost of labor, material, equipment, and reasonable overhead and profit, unless the parties agree on another method for determining the cost or credit.The amounts that Contractor and/or its Subcontractor adds to a Change Order for profit and overhead will be considered by Owner before approval is given. The amounts established hereinafter are the maximums that are acceptable to Owner.

11.8.1 For Work performed by its forces, Contractor will be allowed its actual costs paid for materials, the total amount of its actual wages paid for labor, plus its actual cost paid for State and Federal payroll taxes and for workers' compensation and comprehensive general liability insurance, plus its actual additional bond and builders risk insurance cost if the change results in an increase in the premium paid by Contractor. To the total of the above costs, Contractor will be allowed to add a percentage as noted below to cover overhead and profit combined. Overhead shall be considered to include insurance other than mentioned above, field and office supervisors and assistants, including safety and scheduling personnel, use of small tools, incidental job burdens, and general Home Office expenses, and no separate allowance will be made therefor.

Allowable percentages for overhead and profit on changes will not exceed fifteen percent (15%) if the total of self-performed Work is less than or equal to $10,000, ten percent (10%) if the total of self-performed Work is between $10,000 and $20,000, and seven and one half percent (7 ½%) if the total of self-performed Work is over $20,000, for any specific change priced.

11.8.2 For subcontracted Work each affected Subcontractor shall figure its costs, overhead and profit as describe above for Contractor's Work, all Subcontractor costs shall be combined, and to that total Subcontractor cost to Contractor will be allowed to add a maximum mark-up of ten percent (10%) if the total of all subcontracted Work is less than or equal to $10,000, seven and one half percent (7 ½%) if the total of all subcontracted Work is between $10,000 and $20,000, and five percent (5%) if the total of Subcontractor Work is over $20,000.

11.8.3 On changes involving both additions and deletions, percentages for overhead and profit will be allowed only on the net addition. Owner does not accept and will not pay for additional Contract costs identified as indirect or consequential damages or as damages caused by delay.

11.8.4 For Contracts based on a Guaranteed Maximum Price (GMP), the Construction Manager-at-Risk or Design Builder shall NOT be entitled to a percentage mark-up on any Change Order Work unless the Change Order increases the Guaranteed Maximum Price.

11.9 Unilateral Change Order (ULCO). Owner may issue a written ULCO directing a change in the Work prior to reaching agreement with Contractor on the adjustment, if any, in the Contract price and/or the Contract Time.

11.9.1 Owner and Contractor shall negotiate for appropriate adjustments, as applicable, to the Contract Sum or the Contract Time arising out of a ULCO. As the changed Work is performed, Contractor shall submit its costs for such Work with its Application for Payment beginning with the next Application for Payment within thirty (30) days of the issuance of the ULCO. The Parties reserve their rights to dispute the ULCO amount, subject to Article 15.

11.10 Finality of Changes – Contractor. Upon execution of a Change Order and/or a ULCO by Owner, Contractor and A/E, all costs and time issues claimed by Contractor regarding that change are final and not subject to increase.

11.11 Finality of Changes – Owner. All Change Orders are subject to audit by Owner or its representative at any time in accordance with Article 16.4 and Change Order amounts may be adjusted lower as a result of such audit.

Article 12. Project Completion and Acceptance

12.1 Closing Inspections.

12.1.1 Substantial Completion Inspection. When Contractor considers the entire Work or part thereof Substantially Complete, it shall notify ODR in writing that the Work will be ready for Substantial Completion Inspection on a specific date. Contractor shall include with this notice Contractor's Punchlist to indicate that it has previously inspected all the Work associated with the request for inspection, noting items it has corrected and including all remaining Work items with date scheduled for completion or correction prior to Final Inspection. The failure to include any items on this list does not alter the responsibility of Contractor to complete all Work in accordance with the Contract Documents. If any of the items on this list prevents the Project from being used as intended, Contractor shall not request a Substantial Completion Inspection. Owner and its representatives will review the list of items and schedule the requested inspection, or inform Contractor in writing that such an inspection is premature because the Work is not sufficiently advanced or conditions are not as represented on Contractor's list.

12.1.1.1 Prior to the Substantial Completion Inspection, Contractor shall furnish a copy of its marked-up Record Documents and a preliminary copy of each instructional manual, maintenance and operating manual, parts catalogue, wiring diagrams, spare parts, specified written warranties, and like publications or parts for all installed equipment, systems, and like items as described in the Contract Documents. Delivery of these items is a prerequisite for requesting the Substantial Completion Inspection.

12.1.1.2 On the date requested by Contractor, or as mutually agreed upon pending the status of the Open Items List, A/E, ODR, Contractor, and other Owner representatives as determined by Owner will jointly attend the Substantial Completion Inspection, which shall be conducted by ODR or its delegate. If ODR concurs with the determination of Contractor and A/E that the Work is Substantially Complete, ODR will issue a Certificate of Substantial Completion to be signed by A/E, Owner and Contractor establishing the date of Substantial Completion and identifying responsibilities for security, insurance and maintenance. A/E will provide with this certificate a list of Punchlist items (the pre-final Punchlist) for completion prior to Final Inspection. If Owner occupies the Project upon determination of Substantial Completion, Contractor shall complete all corrective Work at the convenience of Owner, without disruption to Owner's use of the Project for its intended purposes.

12.1.2 Final Inspection. Contractor shall complete the list of items identified on the pre-final Punchlist prior to requesting a Final Inspection. Unless otherwise specified, or otherwise agreed in writing by the Parties as documented on the Certificate of Substantial Completion, Contractor shall complete and/or correct all Work within thirty (30) days of the Substantial Completion Date. Upon completion of the pre-final Punchlist work, Contractor shall give written notice to ODR and A/E that the Work will be ready for Final Inspection on a specific date. Contractor shall accompany this notice with a copy of the updated pre-final Punchlist indicating resolution of all items. On the date specified or as soon thereafter as is practicable, ODR, A/E and Contractor will inspect the Work. A/E will submit to Contractor a final Punchlist of open items that the inspection team requires corrected or completed before final acceptance of the Work.

12.1.2.1 Contractor will correct or complete all items on the final Punchlist before requesting Final Payment. Unless otherwise agreed to in writing by the Parties, Contractor will complete this work within seven (7) days of receiving the final Punchlist. Upon completion of the final Punchlist, Contractor will notify A/E and ODR in writing stating the disposition of each final Punchlist item. A/E, Owner and Contractor shall promptly inspect the completed items. When the Punchlist is complete, and the Contract is fully satisfied according to the Contract Documents, ODR will issue a certificate establishing the date of Final Completion. Completion of all Work is a condition precedent to Contractor's right to receive Final Payment.

12.1.3 Annotation. Any Certificate issued under this Article may be annotated to indicate that it is not applicable to specified portions of the Work, or that it is subject to any limitations as determined by Owner.

12.1.4 Purpose of Inspection. Inspection is to determine the completion of the Work, and does not relieve Contractor of its overall responsibility for completing the Work in a

good and competent fashion, in compliance with the Contract. Work accepted with incomplete Punchlist items or failure of Owner or other Parties to indentify Work that does not comply with the Contract Documents or is defective in operation or workmanship does not constitute a waiver of Owner's rights under the Contract or relieve Contractor of its responsibility for performance of warranties.

12.1.5 Additional Inspections.

12.1.5.1 If Owner's inspection team determines that the Work is not substantially complete at the Substantial Completion Inspection, ODR or A/E will give Contractor written notice listing cause(s) of the rejection. Contractor will set a time for completion of incomplete or defective Work acceptable to ODR. Contractor shall complete or correct all Work so designated prior to requesting a second Substantial Completion Inspection.

12.1.5.2 Of Owner's inspection team determines that the Work is not complete at the Final Inspection, ODR or A/E will give Contractor written notice listing the cause(s) of the rejection. Contractor will set a time for completion of incomplete or defective Work acceptable to ODR. Contractor shall complete or correct all Work so designated prior to again requesting a Final Inspection.

12.1.5.3 The Contract contemplates three (3) comprehensive inspections: the Substantial Completion Inspection, the Final Completion Inspection, and the inspection of completed final Punchlist items. The cost to Owner of additional inspections resulting from the Work not being ready for one or more of these inspections is the responsibility of Contractor. Owner may issue a ULCO deducting these costs from Final Payment. Upon Contractor's written request, Owner will furnish documentation of any costs so deducted. Work added to the Contract by Change Order after Substantial Completion Inspection is not corrective Work for purposes of determining timely completion, or assessing the costs of additional inspections.

12.1.6 Phased Completion. The Contract may provide, or Project conditions may warrant, as determined by ODR, that designated elements or parts of the Work be completed in phases. Where phased completion is required or specifically agreed to by the Parties, the provisions of the Contract related to closing inspections, occupancy, and acceptance apply independently to each designated element or part of the Work. For all other purposes, unless otherwise agreed by the Parties in writing, Substantial Completion of the Work as a whole is the date on which the last element or part of the Work completed receives a Substantial Completion Certificate. Final Completion of the Work

as a whole is the date on which the last element or part of the Work completed receives a Final Completion Certificate or notice.

12.2 Owner's Right of Occupancy. Owner may occupy or use all or any portion of the Work following Substantial Completion, or at any earlier stage of completion. Should Owner wish to use or occupy the Work, or part thereof, prior to Substantial Completion, ODR will notify Contractor in writing and identify responsibilities for security, insurance and maintenance. Work performed on the premises by third parties on Owner's behalf does not constitute occupation or use of the Work by Owner for purposes of this Article. All Work performed by Contractor after occupancy, whether in part or in whole, shall be at the convenience of Owner so as not to disrupt Owner's use of or access to occupied areas of the Project

12.3 Acceptance and Payment.

12.3.1 Request for Final Payment. Following the certified completion of all Work, including all final Punchlist items, cleanup, and the delivery of Record Document, Contractor shall submit a certified Application for Final Payment to include all sums held as retainage, and forward to A/E and ODR for review and approval.

12.3.2 Final Payment Documentation. Contractor shall submit, prior to or with the Application for Final Payment, final copies of all Close-Out documents, maintenance and operating instructions, guarantees and warranties, certificates, Record Documents, and all other items required by the Contract. Contractor shall submit evidence of return of access keys and cards, evidence of delivery to Owner of attic stock, spare parts, and other specified materials. Contractor shall submit a consent of surety to Final Payment form and an affidavit that all payrolls, bills for materials and equipment, subcontracted work and other indebtedness connected with the Work, except as specifically noted, are paid or will be paid after payment from Owner or otherwise satisfied within the period of time required by Tex. Gov't Code, Chapter 2251. Contractor shall furnish documentation establishing payment or satisfaction of all such obligations, such as receipts, releases, and waivers of claims and liens arising out of the Contract. Contractor may not subsequently submit a claim on behalf of a Subcontractor or vendor unless Contractor's affidavit notes that claim as an exception.

12.3.3 Architect/Engineer Approval. A/E will review a submitted Application for Final Payment promptly, but in no event later than ten (10) days after its receipt. Prior to the expiration of this deadline, A/E will either: 1) return the Application for Final Payment to the Contractor with corrections for action and resubmission; or 2) accept it, note A/E's approval, and send the approved Application for Final Payment to Owner.

12.3.4 Offsets and Deductions. Owner may deduct from the Final Payment all sums die from Contractor. If the Certificate of Final Completion notes any Work remaining, incomplete, or defects not remedied, Owner may deduct the cost of remedying such

deficiencies from the Final Payment. On such deduction, Owner will identify each deduction, the amount, and the explanation of the deduction on or by the twenty-first (21st) day after Owner's receipt of an approved Application for Final Payment. Such offsets and deductions shall be incorporated via a final Change Order, including a ULCO as may be applicable.

12.3.5 Final Payment Due. Final Payment is due and payable by Owner, subject to all allowable offsets and deductions, on the thirtieth (30th) day following Owner's approval of the Application for Final Payment. If Contractor disputes any amount deducted by Owner, Contractor shall give notice of the dispute on or before the thirtieth (30th) day following receipt of Final Payment. Failure to do so will bar any subsequent claim for payment of amounts deducted.

12.3.6 Effect of Final Payment. Final Payment constitutes a waiver of all claims by Owner, relating to the condition of the Work, except those arising from:

12.3.6.1 Faulty or defective Work appearing after Substantial Completion (latent defects);

12.3.6.2 Failure of the Work to comply with the requirements of the Contract Documents;

12.3.6.3 Terms of any warranties required by the Contract, or implied by law;

12.3.6.4 Claims arising from personal injury or property damage to third parties.

12.3.7 Waiver of Claims. Final Payment constitutes a waiver of all claims and liens by Contractor except those specifically identified in writing and submitted to ODR prior to the Application for Final Payment.

12.3.8 Effect on Warranty. Regardless of approval and issuance of Final Payment, the Contract is not deemed fully performed by Contractor and closed until the expiration of all warranty periods.

Article 13. Warranty and Guarantee

13.1 Contractor's General Warranty and Guarantee. Contractor warrants to Owner that all Work is executed in accordance with the Contract, complete in all parts and in accordance with approved practices and customs, and of the required finish and workmanship. Contractor further warrants that unless otherwise specified, all materials and equipment incorporated in the Work under the Contract are new. Owner may, at its option, agree in writing to waive any failure of the Work to conform to the Contract, and to accept a reduction in the Contract price for the cost

of repair or diminution in value of the Work by reason of such defect. Absent such a written agreement, Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute and is not waived by any inspection or observation by Owner, A/E, or others, by making any progress payment or final payment, by the use or occupancy of the Work or any portion thereof by Owner, at any time any repair or correction of such defect made by Owner

13.2 Warranty Period. Except as may be otherwise specified or agreed, Contractor shall repair all defects in materials, equipment, or workmanship appearing within one year from the date of Substantial Completion of the Work. If Substantial Completion occurs by phase, then the warranty period for the Work performed for each phase begins on the date of Substantial Completion of that phase, or as otherwise stipulated on the Certificate of Substantial Completion for that particular phase.

13.3 Limits on Warranty. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

13.3.1 Modification or improper maintenance or operation by persons other than Contractor, Subcontractors, or any other individual or entity for whom Contractor is not responsible, unless Owner is compelled to undertake maintenance or operation due to the neglect of Contractor.

13.3.2 Normal wear and tear under normal usage after acceptance of the Work by Owner.

13.4 Events Not Affecting Warranty. Contractor's obligation to perform and complete the Work in a good and workmanlike manner in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or will constitute a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

13.4.1 Observations by Owner and/or A/E;

13.4.2 Recommendation to pay any progress or Final Payment by A/E'

13.4.3 The issuance of a Certificate of Substantial Completion or any payment by Owner to Contractor under the Contract Documents;

13.4.4 Use or occupancy of the Work or any part thereof by Owner;

13.4.5 Any acceptance by Owner or any failure to do so;

13.4.6 Any review of a Shop Drawing or sample submittal; or

13.4.7 Any inspection, test or approval by others.

13.5 Separate Warranties. If a particular piece of equipment or component of the Work for which the Contract requires a separate warranty is placed in continuous service before Substantial Completion, the warranty period for that equipment or component will not begin until Substantial Completion, regardless of any warranty agreements in place between suppliers and/or Subcontractors and Contractor. ODR will certify the date of service commencement in the Certificate of Substantial Completion.

13.5.1 In addition to Contractor's warranty and duty to repair, Contractor expressly assumes all warranty obligations required under the Contract for specific building components, systems and equipment.

13.5.2 Contract may satisfy any such obligation by obtaining and assigning to Owner a complying warranty from a manufacturer, supplier or Subcontractor. Where an assigned warranty is tendered and accepted by Owner which does not fully comply with the requirements of the Contract, Contractor remains liable to Owner on all elements of the required warranty not provided by the assigned warranty.

13.6 Correction of Defects. Upon receipt of written notice from Owner, or any agent of Owner designated as responsible for management of the warranty period, of the discovery of a defect, Contractor shall promptly remedy the defect(s) and provide written notice to Owner and/or its designated agent indicating action taken. In case of emergency where delay would cause serious risk of loss or damage to Owner, or if Contractor fails to remedy within thirty (30) days, or within another period agreed to in writing, Owner may correct the defect and be reimbursed the cost of remedying the defect from Contractor or its Surety.

13.7 Certification of No Asbestos Containing Materials or Work. Contractor shall ensure compliance with the Asbestos Hazard Emergency Response Act (AHERA – 40 C.F.R. § 763-99(7)) from all Subcontractors and materials suppliers, and shall provide a notarized certification to Owner that all equipment and materials used in fulfillment of their Contract duties are non Asbestos Containing Building Materials (ACBMs). This certification must be provided no later than Contractor's Application for Final Payment.

Article 14. Suspension and Termination

14.1 Suspension of Work for Cause. Owner may, at any time without prior notice, suspend all or any part of the Work, after reasonable observation and/or investigation, Owner determines it is necessary to do so to prevent or correct any condition of the Work which constitutes an immediate safety hazard or which may reasonably be expected to impair the integrity, usefulness or longevity of the Work when completed.

14.1.1 Owner will give Contractor a written notice of suspension for cause, setting forth the reason for the suspension and identifying the Work suspended. Upon receipt of such notice, Contractor shall immediately stop the Work so identified. As soon as practicable

following the issuance of such a notice, Owner will initiate and complete a further investigation of the circumstances giving rise to the suspension, and issue a written determination of the findings.

14.1.2 If it is confirmed that the cause was within the control of Contractor, Contractor will not be entitled to an extension of time for delay resulting from the suspension. If the cause is determined not to have been within the control of Contractor, and suspension has prevented Contractor from completing the Work within the Contract Time, the suspension is an excusable delay and a time extension will be granted through a Change Order.

14.1.3 Suspension of Work under this provision will be no longer than is reasonably necessary to remedy the conditions giving rise to the suspension.

14.2 Suspension of Work for Owner's Convenience. Upon seven (7) days written notice to Contractor, Owner may at any time without breach of the Contract suspend all or any portion of the Work for a period of up to sixty (60) days for its own convenience. Owner will give Contractor a written notice of suspension for convenience, which sets forth the number of suspension days for which the Work, or any portion of it, will remain suspended and the date on which the suspension of Work will cease.

14.3 Termination by Owner for Cause.

14.3.1 Upon thirty (30) days written notice to Contractor and its Surety, Owner may, without prejudice to any right or remedy, terminate the Contract and take possession of the Site and of all materials, equipment, tools, construction equipment, and machinery thereon owned by Contractor under any of the following circumstances:

14.3.1.1 Persistent or repeated failure or refusal, except during complete or partial suspensions of work authorized under the Contract, to supply enough properly skilled workmen or proper materials;

14.3.1.2 Persistent disregard of laws, ordinances, rules, regulations or orders of any public authority having jurisdiction, including ODR;

14.3.1.3 Persistent failure to prosecute the Work in accordance with the Contract, and to ensure its completion with the time, or any approved extension thereof, specified in the Contract;

14.3.1.4 Failure to remedy defective Work condemned by ODR;

14.3.1.5 Failure to pay Subcontractors, laborers, or material suppliers pursuant to Tex. Gov't Code, Chapter 2251;

14.3.1.6 Persistent endangerment to the safety of labor or of the Work;

14.3.1.7 Failure to supply or maintain statutory bonds or to maintain required insurance, pursuant to the Contract;

14.3.1.8 Any material breach of the Contract; or

14.3.1.9 Contractor's insolvency, bankruptcy, or demonstrated financial inability to perform the Work.

14.3.2 Failure by Owner to exercise the right to terminate in any instance is not a waiver of the right to do so in any other instance.

14.3.3 Upon receipt of a termination notice, Contractor or its Surety has thirty (30) days to cure the reason(s) for the termination or demonstrate to the satisfaction of Owner that Contractor is prepared to remedy the condition(s) upon which the notice of termination was based with diligence and promptness. If Owner is satisfied that Contractor or its Surety can remedy the reasons for the termination and complete the Work as required, the notice of termination shall be rescinded in writing by Owner and the Work shall continue without an extension of time.

14.3.4 If, at the conclusion of the thirty (30) day cure period, Contractor or its Surety is unable to demonstrate to the satisfaction of Owner Contractor's ability to remedy the reason(s) for the termination, Owner may immediately terminate the employment of Contractor, make alternative arrangements for completion of the Work, and deduct the cost of completion from the unpaid Contract Sum.

14.3.4.1 Owner's cost to complete the Work includes, but is not limited to, fees for additional services by A/E and other consultants, and additional contract administration costs.

14.3.4.2 Owner will make no further payment to Contractor or its Surety unless the costs to complete the Work are less than the Contract balance, in which case the difference shall be paid to Contractor or its Surety. If such costs exceed the unpaid balance, Contractor or its Surety will pay the difference to Owner.

14.3.4.3 This obligation for payment survives the termination of the Contract.

14.3.4.4 Owner reserves the right in termination for cause to take assignment of all the Contracts between Contractor and its Subcontractors, vendors, and suppliers. ODR will promptly notify Contractor of the

contracts Owner elects to assume. Upon receipt of such notices, Contractor shall promptly take all steps necessary to effect such assignment(s).

14.4 Conversion to Termination for Convenience. In the event that any termination of Contractor for cause under Section 14.3 is later determined to have been improper, the termination shall automatically convert to a termination for convenience under Section 14.5 and Contractor's recovery for termination shall be strictly limited to the payments allowable under Section 14.5.

14.5 Termination for Convenience of Owner. Owner reserves the right, without breach, to terminate the Contract prior to, or during the performance of the Work, for any reason. Upon such an occurrence, the following shall apply:

14.5.1 Owner will notify Contractor and A/E in writing specifying the reason for and the effective date of the Contract termination. The notice may also contain instructions necessary for the protection, storage, or decommissioning of incomplete work or systems, and for safety.

14.5.2 Upon receipt of the notice of termination, Contractor shall immediately proceed with the following obligations, regardless of any dispute in determining or adjusting any amounts due at that point in the Contract:

14.5.2.1 Stop all work.

14.5.2.2 Place no further subcontracts or orders for materials or services.

14.5.2.3 Terminate all subcontracts for convenience.

14.5.2.4 Cancel all materials and equipment orders as applicable.

14.5.2.5 Take appropriate action that is necessary to protect and preserve all property related to the Contract which is in the possession of Contractor.

14.5.3 When the Contract is terminated for Owner's convenience, Contractor may recover from Owner payment for all Work executed. Contractor may not claim lost profits or lost business opportunities.

14.6 Termination by Contractor. If the Work is stopped for a period of ninety (90) days under an order of any court or other public authority having jurisdiction, or as a result of an act of government, such as a declaration of a national emergency making materials unavailable, through no act or fault of Contractor or Subcontractor or their agents or employees or any other persons performing any of the Work under a contract with Contractor, then Contractor may,

upon thirty (30) additional days written notice to ODR, terminate the Contract and recover from Owner payment for all Work executed, but not lost profits or lost business opportunities. If the cause of the Work stoppage is removed prior to the end of the thirty (30) day notice period, Contractor may not terminate the Contract.

14.7 Settlement on Termination. When the Contract is terminated for any reason, at any time prior to one hundred eighty (180) days after the effective date of termination, Contractor shall submit a final termination settlement proposal to Owner based upon recoverable costs as provided under the Contract. If Contractor fails to submit the proposal within the time allowed, Owner may unilaterally determine the amount due to Contractor because of the termination and pay the determined amount to Contractor.

Article 15. Dispute Resolution

15.1 To the extent that Chapter 2260, *Texas Government Code*, is applicable to this Agreement and is not preempted by other applicable law, the dispute resolution process provided for in Chapter 2260 and the related rules adopted by the Texas Attorney General pursuant to Chapter 2260, shall be used by TSTC and Contractor to attempt to resolve any claim for breach of contract made by Contractor that cannot be resolved in the ordinary course of business. The Chief Business Officer of TSTC shall examine Contractor's claim and any counterclaim and negotiate with Contractor in an effort to resolve such claims. The parties hereto specifically agree that (i) neither the execution of this Agreement by TSTC nor any other conduct, action or inaction of any representative of TSTC relating to this Agreement constitutes or is intended to constitute a waiver of TSTC's or the state's sovereign immunity to suit; and (ii) TSTC has not waived its right to seek redress in the courts.

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a. To the extent that Chapter 2260,*Texas Government Code*, as it may be amended from time to time ("Chapter 2260"), is applicable to this Agreement and is not preempted by other applicable law, the dispute resolution process provided for in Chapter 2260 shall be used, as further described herein, by TSTC and Contractor to attempt to resolve any claim for breach of contract made by Contractor:

    i. Contractor's claims for breach of this Agreement that the parties cannot resolve pursuant to other provisions of this Agreement or in the ordinary course of business shall be submitted to the negotiation process provided in subchapter B of Chapter 2260. To initiate the process, Contractor shall submit written notice, as required by subchapter B of Chapter 2260, to TSTC in accordance with the notice provisions in this Contract. Contractor's notice shall specifically state that the provisions of subchapter B of Chapter 2260 are being invoked, the date and nature of the event giving rise to the claim, the specific Agreement provision that TSTC allegedly breached, the

amount of damages Contractor seeks, and the method used to calculate the damages. Compliance by Contractor with subchapter B of Chapter 2260 is a required prerequisite to Contractor's filing of a contested case proceeding under subchapter C of Chapter 2260. The Chief Business Officer of TSTC, or such other officer of TSTC as may be designated from time to time by TSTC by written notice thereof to Contractor in accordance with the notice provisions in this Contract, shall examine Contractor's claim and any counterclaim and negotiate with Contractor in an effort to resolve such claims.

ii. If the parties are unable to resolve their disputes under subparagraph (a.) of this section, the contested case process provided in subchapter C of Chapter 2260 is Contractor's sole and exclusive process for seeking a remedy for any and all of Contractor's claims for breach of this Agreement by TSTC.

iii. Compliance with the contested case process provided in subchapter C of Chapter 2260 is a required prerequisite to seeking consent to sue from the Legislature under Chapter 107 of the Texas Civil Practices and Remedies Code. The parties hereto specifically agree that (1) neither the execution of this Agreement by TSTC nor any other conduct, action or inaction of any representative of TSTC relating to this Agreement constitutes or is intended to constitute a waiver of TSTC's or the state's sovereign immunity to suit and (2) TSTC has not waived its right to seek redress in the courts.

b. The submission, processing and resolution of Contractor's claim is governed by the published rules adopted by the Texas Attorney General pursuant to Chapter 2260, as currently effective, hereafter enacted or subsequently amended.

c. TSTC and Contractor agree that any periods set forth in this Agreement for notice and cure of defaults are not waived.

15.3 Nothing herein shall hinder, prevent, or be construed as a waiver of Owner's right to seek redress on any disputed matter in a court of competent jurisdiction.

15.4 Nothing herein shall waive or be construed as a waiver of the State's sovereign immunity.

Article 16. Miscellaneous

16.1 Supplementary General and Special Conditions. When the Work contemplated by Owner is of such a character that the foregoing Uniform General Conditions of the Contract cannot

adequately cover necessary and additional contractual relationships, the Contract may include Supplementary General and Special Conditions as described below:

16.1.1 Supplementary General Conditions may describe the standard procedures and requirements of contract administration followed by a contracting agency of the State of Texas. Supplementary General Conditions may expand upon matter covered by the Uniform General Conditions, where necessary, provided the expansion does not weaken the character or intent of the Uniform General Conditions. Supplementary General Conditions are of such a character that it is to be anticipated that a contracting agency of the State will normally use the same, or similar, conditions to supplement each of its projects.

16.1.2 Special Conditions shall relate to a particular Project and be unique to that Project but shall not weaken the character or intent of the Uniform General Conditions.

16.1.3 A Sanitary Sewer CCTV Report entitled Waco TSTC Campus CCTV was prepared by Burgess & Niple, Inc. in June of 2016, a copy of which and corresponding videos is available (from the Owner) upon request through the Engineer.

16.2 Federally Funded Projects. On Federally funded projects, Owner may waive, suspend or modify any Article in these Uniform General Conditions which conflicts with any Federal statute, rule, regulation or procedure, where such waiver, suspension or modification is essential to receipt by Owner of such Federal funds for the Project. In the case of any Project wholly financed by Federal funds, any standards required by the enabling Federal statute, or any Federal rules, regulations or procedures adopted pursuant thereto, shall be controlling.

16.3 Internet-Based Project Management Systems. At its option, Owner may administer its design and construction management through an Internet-based management system. In such cases, Contractor shall conduct communication through this media and perform all Project related functions utilizing this database system. This includes correspondence, submittals, Requests for Information, vouchers or payment requests and processing, amendments, Change Orders and other administrative activities.

16.3.1 Accessibility and Administration.

16.3.1.1 When used, Owner will make the software available via the Internet to all Project team members.

16.3.1.2 Owner shall administer the software.

16.3.2 Training. When used, Owner shall provide training to the Project team members.

16.4 Right to Audit.

16.4.1 Contractor understands that acceptance of funds under this Contract acts as acceptance of the authority of the State Auditor's Office, Owner, any successor agency and their representatives, including independent auditors, to conduct an audit or investigation in connection with these funds. Contractor further agrees to cooperate fully with any party conducting the audit or investigation, including providing all records requested.

16.4.2 Contractor shall maintain and retain supporting fiscal and any other documents relevant to showing that any payments under this Contract were expended in accordance with the terms of this Contract, the requirements of Owner, and with the laws and regulations of the State of Texas including, but not limited to, requirements of the Comptroller of the State of Texas and the State Auditor. Contractor shall maintain all such documents and other records relating to this Contract and Owner's property for a period of four (4) years after the date of submission of a request for Final Payment or until a resolution of all billing questions, whichever is later. Contractor shall make available at reasonable times and upon reasonable notice and for reasonable periods all documents and other information related to the Work of this Contract.

16.4.3 Contractor shall ensure that this clause concerning the authority to audit funds receive indirectly by subcontractors through the Contractor and the requirement to cooperate is included in any subcontract it awards.

END OF UNIFORM GENERAL CONDITIONS

Attachment I

WATER & WASTEWATER IMPROVEMENTS

PROJECT SPECIFICATIONS

MARCH 2017

PROJECT NUMBER 3-00580

3/1/2017 Clark W. Gauer, P.E.

STATE OF TEXAS
CLARK W. GAUER
#80599
REGISTERED
PROFESSIONAL ENGINEER

Walker Partners
engineers ★ surveyors

T.B.P.E. Registration No. 8053

SECTION 01 20 00 - PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Contingency allowances.

B. Testing and inspection allowances.

C. Schedule of Values.

D. Application for Payment.

E. Change procedures.

F. Defect assessment.

G. Unit prices.

H. Alternates.

1.2 CONTINGENCY ALLOWANCES

A. Include in Contract a stipulated sum/price of $100,000.00 for use upon Owner's instruction as a contingency allowance.

B. Contractor's costs for products, delivery, installation, labor, insurance, payroll, taxes, bonding, equipment rental, overhead, and profit will be included in Change Orders authorizing expenditure of funds from this contingency allowance.

C. Funds will be drawn from contingency allowance only by Change Order.

D. At closeout of Contract, funds remaining in contingency allowance will be credited to Owner by Change Order.

1.3 TESTING AND INSPECTION ALLOWANCES – Not Used

1.4 SCHEDULE OF VALUES – Not Used

1.5 APPLICATION FOR PAYMENT

A. Submit three copies of each Application for Payment on EJCDC C-620 - Contractor's Application for Payment or a Contractor’s electronic media driven form as approved by the Engineer.

B. Content and Format: list all items in Application for Payment.

C. Submit updated construction schedule with each Application for Payment.

D. Payment Period: Submit at intervals stipulated in the Agreement.

E. Submit submittals as specified in Section 01 33 00 - Submittal Procedures.

F. Substantiating Data: When Engineer requires substantiating information, submit data justifying dollar amounts in question. Include the following with Application for Payment:
   1. Partial release of liens from major Subcontractors and vendors.
   2. Record Documents as specified in Section 01 70 00 - Execution and Closeout Requirements, for review by Owner, which will be returned to Contractor.
   3. Affidavits attesting to off-Site stored products.
   4. Construction Progress Schedule, revised and current as specified in Section 01 32 16 – Construction Project Schedule.

1.6 CHANGE PROCEDURES

A. Submittals: Submit name of individual who is authorized to receive change documents and is responsible for informing others in Contractor's employ or Subcontractors of changes to the Work.

B. Carefully study and compare Contract Documents before proceeding with fabrication and installation of Work. Promptly advise Architect/Engineer of any error, inconsistency, omission, or apparent discrepancy.

C. Engineer will advise of minor changes in the Work not involving adjustment to Contract Sum/Price or Contract Time by issuing field orders on EJCDC C-942.

D. Engineer may issue Proposal Request including a detailed description of proposed change with supplementary or revised Drawings and Specifications, a change in Contract Time for executing the change and with the period of time during which the requested price will be considered valid. Contractor will prepare and submit estimate within 10 calendar days.

E. Contractor may propose changes by submitting a request for change to Engineer, describing proposed change and its full effect on the Work. Include a statement describing reason for the change and the effect on Contract Sum/Price and Contract Time with full documentation and a statement describing effect on the Work by separate or other Contractors. Document requested substitutions according to Section 01 60 00 – Product Requirements.

F. Stipulated Sum/Price Change Order: Based on Proposal Request and Contractor's fixed price quotation or Contractor's request for Change Order as recommended by Engineer and approved by Owner.

G. Unit Price Change Order: For Contract unit prices and quantities, the Change Order will be executed on a fixed unit price basis. For unit costs or quantities of units of that which are not predetermined, execute Work under Work Directive Change. Changes in Contract Sum/Price or Contract Time will be computed as specified for Time and Material Change Order.

H. Work Directive Change: Engineer may issue directive, on EJCDC C-940 - Work Change Directive signed by Owner, instructing Contractor to proceed with change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work and

designate method of determining any change in Contract Sum/Price or Contract Time. Promptly execute change.

I. Document each quotation for change in Project Cost or Time with sufficient data to allow evaluation of quotation.

J. Change Order Forms: EJCDC C-941 - Change Order or as approved by Engineer.

K. Execution of Change Orders: Engineer will issue Change Orders for signatures of parties as provided in Conditions of the Contract.

L. Correlation of Contractor Submittals:
   1. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as separate line item and adjust Contract Sum/Price.
   2. Promptly revise Progress Schedules to reflect change in Contract Time, revise subschedules to adjust times for other items of Work affected by the change, and resubmit.
   3. Promptly enter changes in Record Documents.

1.7 DEFECT ASSESSMENT

A. Replace the Work, or portions of the Work, not conforming to specified requirements.

B. If, in the opinion of Engineer, it is not practical to remove and replace the Work, Engineer will direct appropriate remedy or adjust payment.

C. The defective Work may remain, but unit sum/price will be adjusted to new sum/price at discretion of Engineer and Owner.

D. Individual Specification Sections may modify these options or may identify specific formula or percentage sum/price reduction.

E. Authority of Engineer and Owner to assess defects and identify payment adjustments is final.

F. Nonpayment for Rejected Products: Payment will not be made for rejected products for any of the following reasons:
   1. Products wasted or disposed of in a manner that is not acceptable.
   2. Products determined as unacceptable before or after placement.
   3. Products not completely unloaded from transporting vehicle.
   4. Products placed beyond lines and levels of the required Work.
   5. Products remaining on hand after completion of the Work.
   6. Loading, hauling, and disposing of rejected products.

1.8 UNIT PRICES

A. Authority: Measurement methods are delineated in individual Specification Sections.

B. Measurement methods delineated in individual Specification Sections complement criteria of this Section. In event of conflict, requirements of individual Specification Section govern.

C. Take measurements and compute quantities. Engineer will verify measurements and quantities.

D. Unit Quantities: Quantities and measurements indicated on Bid Form are for Contract purposes only. Actual quantities provided shall determine payment.
   1. When actual Work requires more or fewer quantities than those quantities indicated, provide required quantities at contracted unit sum/prices.
   2. When actual Work requires 25 percent or greater change in quantity than those quantities indicated, Owner or Contractor may claim a Contract Price adjustment.

E. Payment Includes: Full compensation for required labor, products, tools, equipment, plant and facilities, transportation, services and incidentals; erection, application, or installation of item of the Work; overhead and profit.

F. Final payment for Work governed by unit prices will be made on basis of actual measurements and quantities accepted by Architect/Engineer multiplied by unit sum/price for Work incorporated in or made necessary by the Work.

G. Measurement of Quantities:
   1. Measurement by Volume: Measured by cubic dimension using mean length, width, and height or thickness.
   2. Measurement by Area: Measured horizontally by square dimension using mean length and width or radius.
   3. Linear Measurement: Measured horizontally by linear dimension, at item centerline or mean chord.
   4. Stipulated Sum/Price Measurement: Items measured by weight, volume, area, or linear means or combination, as appropriate, as completed item or unit of the Work.

1.9 ALTERNATES

A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in Owner-Contractor Agreement.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01 21 00 – MOBILIZATION, TRAFFIC HANDLING, AND INCIDENTALS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Project Mobilization and Demobilization.
   2. Traffic Handling.
   3. All project costs (incidentals) not included in the contract bid items.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Basis of Measurement: By the Lump Sum as the work progresses.

B. Basis of Payment: This item will be paid for at the contract unit price bid for Mobilization, Traffic Handling, and Project Incidentals, which price shall be full compensation for mobilization and demobilization of all contractor personnel, facilities, equipment, and supplies, for all equipment, labor, and material associated with traffic handling, and all other project costs not specifically covered in the contract bid items.

C. Partial payments for this item will be administered as follows. The adjusted contract amount for construction items as used below is defined as the total contract amount less the lump sum bid for mobilization.
   1. When 1% of the adjusted contract amount for construction items is earned, 50% of the mobilization lump sum bid will be paid.
   2. When 5% of the adjusted contract amount for construction items is earned, 75% of the mobilization lump sum bid will be paid.
   3. When 10% of the adjusted contract amount for construction items is earned, 90% of the mobilization lump sum bid will be paid.
   4. Upon completion of all work items, payment for the remainder of the mobilization lump sum bid will be made.

D. The lump sum bid for mobilization shall not exceed 10% of the total contract.

1.3 REFERENCES – Not used.

1.4 QUALITY ASSURANCE – Not used.

PART 2 PRODUCTS – Not used.

PART 3 EXECUTION – Not used.

END OF SECTION

SECTION 01 32 16 - CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Submittals.

B. Quality assurance.

C. Format for network analysis schedules.

D. Network analysis schedules.

E. Bar chart schedules.

F. Review and evaluation.

G. Updating schedules.

H. Distribution.

1.2 SUBMITTALS

A. Within 10 days after date of Owner-Contractor Agreement, submit proposed preliminary network diagram defining planned operations for first 60 days of Work, with general outline for remainder of Work.

B. Participate in review of preliminary and complete network diagrams jointly with Engineer.

C. Within 20 days after joint review of proposed preliminary network diagram, submit draft of proposed complete network diagram for review.

D. Within 10 days after joint review, submit complete network analysis consisting of network diagrams and mathematical analyses.

E. Submit updated network schedules with each Application for Payment.

F. Submit one reproduction.

G. Submit network schedules under transmittal letter form specified in Section 01 33 00 - Submittal Procedures.

H. Schedule Updates:
   1. Overall percent complete, projected and actual.
   2. Completion progress by listed activity, to within five working days prior to submittal.
   3. Delays in Work.
   4. Adjusted or modified sequences of Work.
   5. Other identifiable changes.

6. Revised projections of progress and completion.

I. Narrative Progress Report:
   1. Submit with each monthly submission of Progress Schedule.
   2. Summary of Work completed during the past period between reports.
   3. Work planned during the next period.
   4. Explanation of differences between summary of Work completed and Work planned in previously submitted report.
   5. Current and anticipated delaying factors and estimated impact on other activities and completion milestones.
   6. Corrective action taken or proposed.

1.3 QUALITY ASSURANCE

A. Scheduler: Contractor's personnel with experience in scheduling construction work of complexity comparable to the Project, and having use of computer facilities capable of delivering detailed graphic printout within 48 hours of request.

1.4 FORMAT FOR NETWORK ANALYSIS SCHEDULE

A. Listings: Reading from left to right, in ascending order for each activity. Identify each activity.

B. Diagram Sheet Size: 22 inches high x 34 inches wide.

C. Scale and Spacing: To allow for notations and revisions.

1.5 NETWORK ANALYSIS SCHEDULES – Not Used

1.6 BAR CHART SCHEDULES

A. Format: Bar chart Schedule, to include at least:
   1. Identification and listing in chronological order of those activities reasonably required to complete the Work, including:
      a. Subcontract Work.
      b. Major equipment design, fabrication, factory testing, and delivery dates including required lead times.
      c. Move-in and other preliminary activities.
      d. Work sequences, constraints, and milestones.
   2. Identification of the following:
      a. Horizontal time frame by year, month, and week.
      b. Duration, early start, and completion for each activity and subactivity.
      c. Critical activities and Project float.
      d. Subschedules to further define critical portions of Work.

1.7 REVIEW AND EVALUATION

A. Participate in joint review and evaluation of schedules with Engineer at each submittal.

B. Evaluate Project status to determine Work behind schedule and Work ahead of schedule.

C. After review, revise schedules incorporating results of review, and resubmit within 10 days.

1.8 UPDATING SCHEDULES

A. Maintain schedules to record actual start and finish dates of completed activities.

B. Indicate progress of each activity to date of revision, with projected completion date of each activity. Update schedules to depict current status of Work.

C. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.

D. Upon approval of a Change Order, include the change in the next schedule submittal.

E. Indicate changes required to maintain Date of Substantial Completion.

F. Submit sorts as required to support recommended changes.

G. Prepare narrative report to define problem areas, anticipated delays, and impact on schedule. Report corrective action taken or proposed and its effect including effects of changes on schedules of separate Contractors.

1.9 DISTRIBUTION

A. Following joint review, distribute copies of updated schedules to Contractor's Project site file, to Engineer, and other concerned parties.

B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Submittal procedures.

B. Construction progress schedules.

C. Proposed product list.

D. Product data.

E. Use of electronic CAD files of Project Drawings.

F. Shop Drawings.

G. Samples.

H. Design data.

I. Test reports.

J. Certificates.

K. Manufacturer's instructions.

L. Manufacturer's field reports.

M. Erection Drawings.

N. Contractor review.

O. Engineer review.

1.2 SUBMITTAL PROCEDURES

A. Submittals shall be directly from the Contractor. Submittals from others (i.e., suppliers or subcontractors) shall not be accepted.

B. Transmit each submittal on an Engineer accepted form.

C. Sequentially number transmittal forms. Mark revised submittals with original number and sequential alphabetic suffix.

D. Identify Project, Contractor, subcontractor and supplier; pertinent drawing and detail number, and specification section number, appropriate to submittal.

E. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents.

F. Schedule submittals to expedite Project, and deliver to Engineer at business address. Coordinate submission of related items.

G. For each submittal for review, allow 15 days excluding delivery time to and from Contractor.

H. Identify variations from Contract Documents and product or system limitations which may be detrimental to successful performance of completed Work.

I. Allow space on submittals for Contractor and Engineer review stamps.

J. When revised for resubmission, identify changes made since previous submission.

K. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report inability to comply with requirements.

L. Submittals not requested will not be recognized or processed.

M. Incomplete Submittals: Engineer will not review. Complete submittals for each item are required. Delays resulting from incomplete submittals are not the responsibility of Engineer.

1.3 CONSTRUCTION PROGRESS SCHEDULES

A. Comply with Section 01 32 16 - Construction Progress Schedule

1.4 PROPOSED PRODUCT LIST

A. Within 15 days after date of Notice to Proceed, submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

B. For products specified only by reference standards, indicate manufacturer, trade name, model or catalog designation, and reference standards.

1.5 PRODUCT DATA

A. Product Data: Action Submittal: Submit to Engineer for review for assessing conformance with information given and design concept expressed in Contract Documents.

B. Submit electronic submittals via email as PDF electronic files.

C. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

D. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

E. After review, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 01 70 00 - Execution and Closeout Requirements.

1.6 ELECTRONIC CAD FILES OF PROJECT DRAWINGS

A. Electronic CAD Files of Project Drawings: May only be used to expedite production of Shop Drawings for the Project. Use for other Projects or purposes is not allowed.

B. Electronic CAD Files of Project Drawings: Distributed only under the following conditions:
   1. Use of files is solely at receiver's risk. Engineer does not warrant accuracy of files. Receiving files in electronic form does not relieve receiver of responsibilities for measurements, dimensions, and quantities set forth in Contract Documents. In the event of ambiguity, discrepancy, or conflict between information on electronic media and that in Contract Documents, notify Engineer of discrepancy and use information in hard-copy Drawings and Specifications.
   2. CAD files do not necessarily represent the latest Contract Documents, existing conditions, and as-built conditions. Receiver is responsible for determining and complying with these conditions and for incorporating addenda and modifications.
   3. User is responsible for removing information not normally provided on Shop Drawings and removing references to Contract Documents. Shop Drawings submitted with information associated with other trades or with references to Contract Documents will not be reviewed and will be immediately returned.
   4. Receiver shall not hold Engineer responsible for data or file clean-up required to make files usable, nor for error or malfunction in translation, interpretation, or use of this electronic information.
   5. Receiver shall understand that even though Engineer has computer virus scanning software to detect presence of computer viruses, there is no guarantee that computer viruses are not present in files or in electronic media.
   6. Receiver shall not hold Engineer responsible for such viruses or their consequences, and shall hold Engineer harmless against costs, losses, or damage caused by presence of computer virus in files or media.

1.7 SHOP DRAWINGS

A. Shop Drawings: Action Submittal: Submit to Engineer for assessing conformance with information given and design concept expressed in Contract Documents.

B. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

C. When required by individual Specification Sections, provide Shop Drawings signed and sealed by a professional Engineer responsible for designing components shown on Shop Drawings.
   1. Include signed and sealed calculations to support design.
   2. Submit Shop Drawings and calculations in form suitable for submission to and approval by authorities having jurisdiction.
   3. Make revisions and provide additional information when required by authorities having jurisdiction.

D. Submit number of opaque reproductions Contractor requires, plus two copies Engineer will retain.

E. After review, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 01 70 00 - Execution and Closeout Requirements.

1.8 SAMPLES – Not Used

1.9 DESIGN DATA

A. Submit for Engineer's knowledge as contract administrator or for Owner.

B. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

1.10 TEST REPORTS

A. Informational Submittal: Submit reports for Engineer's knowledge as Contract administrator or for Owner.

B. Submit test reports for information for assessing conformance with information given and design concept expressed in Contract Documents.

1.11 CERTIFICATES

A. Informational Submittal: When specified in Technical Specifications, submit certification by manufacturer, installation/application Subcontractor, or Contractor to Engineer, in quantities specified for Product Data.

B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

C. Certificates may be recent or previous test results on material or product but must be acceptable to Architect/Engineer.

1.12 MANUFACTURER'S INSTRUCTIONS

A. Informational Submittal: When specified in Technical Specifications, submit manufacturer's installation instructions for Engineer's knowledge as Contract administrator or for Owner.

B. Submit printed instructions for delivery, storage, assembly, installation, startup, adjusting, and finishing, to Engineer for delivery to Owner in quantities specified for Product Data.

C. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.13 MANUFACTURER'S FIELD REPORTS – Not Used

1.14 ERECTION DRAWINGS – Not Used

1.15 CONTRACTOR REVIEW

A. Review for compliance with Contract Documents and approve submittals before transmitting to Engineer.

B. Contractor: Responsible for:
   1. Determination and verification of materials including manufacturer's catalog numbers.
   2. Determination and verification of field measurements and field construction criteria.
   3. Checking and coordinating information in submittal with requirements of Work and of Contract Documents.
   4. Determination of accuracy and completeness of dimensions and quantities.
   5. Confirmation and coordination of dimensions and field conditions at Site.
   6. Construction means, techniques, sequences, and procedures.
   7. Safety precautions.
   8. Coordination and performance of Work of all trades.

C. Stamp, sign or initial, and date each submittal to certify compliance with requirements of Contract Documents.

D. Do not fabricate products or begin Work for which submittals are required until approved submittals have been received from Engineer.

1.16 ENGINEER REVIEW

A. Do not make "mass submittals" to Engineer. "Mass submittals" are defined as six or more submittals or items in one day or 15 or more submittals or items in one week. If "mass submittals" are received, Engineer's review time stated above will be extended as necessary to perform proper review. Engineer will review "mass submittals" based on priority determined by Engineer after consultation with Owner.

B. Informational submittals and other similar data are for Engineer's information, do not require Engineer's responsive action, and will not be reviewed or returned with comment.

C. Submittals made by Contractor that are not required by Contract Documents may be returned without action.

D. Submittal approval does not authorize changes to Contract requirements unless accompanied by Change Order, Field Order, or Work Change Directive.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION

3.1 Section 31 05 13 – Soils For Earthwork

A. Samples: Submit, in air tight containers, 10 lb sample of each type of fill to testing laboratory.

B. Materials Source: Submit name of imported materials source.

3.2 Section 31 23 15 – Trench Safety Systems

A. Trench Safety Plan: Prior to construction the Contractor shall submit five copies of a trench safety system to the Engineer specifically for the construction of trench excavation. The trench safety system shall be in accordance with OSHA standards governing the presence and activities of individuals working in and around trench excavation. The trench safety system must be designed and sealed by a professional engineer registered in the State of Texas with professional experience in Soil Mechanics. The Contractor is responsible for obtaining borings and soil analysis as required for plan design. After receiving the trench safety system plans, the Engineer will forward a copy of the plan to the project inspector, to the Contractor and keep one file copy. The submittal is only for general conformance review with OSHA safety standards and the review does not relieve the Contractor or design professional of any or all construction means, methods, techniques and procedures. Any property damage, bodily injury or death that arises from use of the trench safety system or from the Owner's failure to note exceptions to the system shall remain the sole responsibility of the Contractor. No trenching in excess of 5 feet below existing grade will be allowed until the plan is submitted. Any changes in the trench safety system after the initiation of construction will not be cause for extension of time or change order and will require the same review process. On some projects, the Owner may elect to provide preliminary soil information to the Contractors for bid purposes only and not as a substitute for required soil data for design use. The Owner assumes no liability nor makes any guarantees by the inclusion of any soil data.

3.3 Section 31 23 16 – Excavation

A. Excavation Protection Plan: Describe sheeting, shoring, and bracing materials and installation required to protect excavations and adjacent structures and property; include structural calculations to support plan.

3.4 Section 31 23 17 – Trenching

A. Product Data: Submit data for geotextile fabric indicating fabric and construction.

B. Materials Source: Submit name of imported fill materials suppliers.

3.5 Section 31 23 24 – Flowable Fill

A. Materials Source: Submit name of flowable fill materials suppliers.

B. Manufacturer's Certificate:
   1. Certify Product meets or exceeds specified requirements.

C. Mix Design:

1. Submit flowable fill mix design for each specified strength. Submit separate mix designs when admixtures are require for the following:
   a. Flowable fill work during hot and cold weather.
   b. Air entrained flowable fill work.
2. Identify design mix ingredients, proportions, properties, admixtures, and tests.
3. Submit test results to certify flowable fill mix design properties meet or exceed specified requirements.

3.6 Section 31 25 12 – Storm Water Pollution Prevention

A. Submit one copy of the SWP3 to Engineer for record retention purposes only. Engineer will not review or approve the SWP3.

3.7 Section 32 05 16 – Aggregates for Civil Site Improvements

A. Materials Source: Submit name of imported materials suppliers.

B. Manufacturer's Certificate: Certify that aggregates meet or exceed specified requirements.

C. Samples: Submit, in air-tight containers, 10 lb samples of each type of fill to testing laboratory.

3.8 Section 32 11 23 – Flexible Base

A. Materials Source: Submit name of aggregate materials suppliers.

B. Manufacturer's Certificate: Certify Flexible Base meets or exceeds specified requirements outlined herein.

C. Samples: Submit, in air-tight containers, 10 lb sample of each type of Flexible Base to testing laboratory.

D. Product Data:
   1. Submit data for geotextile fabric and herbicide.

3.9 Project Notes – Hot Mix Asphaltic Concrete Paving

A. Product Data:
   1. Submit product information for asphalt and aggregate materials.
   2. Submit mix design with laboratory test results supporting design.

B. Pavement marking plan indicating lane separations and defined parking places. Note dedicated handicapped spaces with international graphics symbol.

3.10 Project Notes – Concrete Paving

A. Product Data:
   1. Submit data on concrete materials, joint filler, admixtures, and curing compounds.

B. Design Data:

1. Submit concrete mix design for each concrete strength. Submit separate mix designs when admixtures are required for the following:
   a. Hot and cold weather concrete work.
2. Identify mix ingredients and proportions, including admixtures.
3. Identify chloride content of admixtures and whether or not chloride was added during manufacture.

C. Source Quality Control Submittals: Indicate results of shop factory tests and inspections.

3.11 Section 32 31 13 – Chain Link Fences and Gates

A. Shop Drawings: Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage, gates, and schedule of components.

B. Product Data: Submit data on fabric, posts, accessories, fittings and hardware.

3.12 Section 32 92 19 – Seeding

A. Product Data: Submit data for seed mix, fertilizer, mulch, stabilizer and other accessories.

3.13 Section 32 92 23 – Sodding

A. Product Data: Submit data for sod grass species, fertilizer, mulch, herbicide and other accessories.

B. Submit minimum 10 oz sample of topsoil proposed. Forward sample to approved testing laboratory in sealed containers to prevent contamination.

C. Test Reports: Indicate topsoil nutrient and pH levels with recommended soil supplements and application rates.

3.14 Section 33 01 30 – Frames, Grates, Rings, and Covers

A. Product Data: Submit manhole covers and riser rings construction, features, configuration, dimensions, and manufacturer.

B. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

3.15 Section 33 01 32 – Sewer and Manhole Testing

A. Submit the following prior to start of testing:
   1. Testing procedures.
   2. List of test equipment.
   3. Testing sequence schedule.
   4. Provisions for disposal of flushing and test water.
   5. Certification of test gauge calibration.
   6. Deflection mandrel drawings and calculations.

B. Test Reports: Indicate results of manhole and piping tests.

3.16 Section 33 01 37 – Pipe Bursting of Gravity Sewer Mains

A. Product Data: Submit manufacturer’s information on pipe materials.

B. Submit Manufacturer's Installation Instructions:
   1. Include description of procedures for sealing at manholes and reestablishing service connections.
   2. Submit manufacturer’s requirements for receiving, handling, and storage of materials.

C. Video Tapes:
   1. Submit video tape recordings of piping sections as follows:
      a. Showing condition of existing pipe and pipe joints, and location of existing service connections.
      b. After work is complete showing pipe and reestablished service connections.

D. Detailed construction procedures, and layout plans to include sequence of construction.

E. Locations, sizes and construction methods for the service reconnection pits.

F. Methods of construction, reconnection and restoration of existing service laterals.

G. Detailed descriptions of the methods of modifying existing manholes.

H. Detailed procedures for the installation and bedding of the new pipe in the launching and receiving pits.

I. Sewer bypass plans, methods and list of equipment to be utilized.

J. Description of the method to remove and dispose of the host pipe, if required.

K. The safety plan in conformance with the Contract Documents and OSHA regulations.

L. Contingency plans for the following potential conditions:
   1. Unforeseen obstruction(s) causing burst stoppage, such as unanticipated change(s) in host pipe material, repair section(s), concrete encasement(s) or cradle(s), buried or abandoned manhole(s) or changes in direction not depicted on maps provided by the Contracting Authority.
   2. Substantial surface heave occurs due to the depth of the existing pipe vs. the amount of upsizing.
   3. Damage to existing service connections and to the replacement pipeline’s structural integrity and methods of repair.
   4. Damage to other existing utilities.
   5. Loss of and return to line and grade.
   6. Soil heaving or settlement.

3.17 Section 33 01 38 – Pipe Bursting of Potable Water Mains

A. Product Data: Submit manufacturer’s information on pipe materials.

B. Submit Manufacturer's Installation Instructions:

1. Include description of procedures for sealing at manholes and reestablishing service connections.
2. Submit manufacturer's requirements for receiving, handling, and storage of materials.

C. Detailed construction procedures, and layout plans to include:
1. Sequence of construction.
2. Pit locations for pipe insertion and bust machine location.
3. Pit locations for service re-connects.
4. Schedule of when various sections are to be rehabilitated.
5. Distances of each pull.
6. Isolating points used to seal the system during the pipe burst.
7. Chlorination/De-chlorination logs for each pipe section.

D. Locations, sizes and construction methods for the service reconnection pits.

E. Methods of construction, reconnection and restoration of existing service lines.

F. Detailed procedures for the installation and bedding of the new pipe in the launching and receiving pits.

G. Temporary potable water service plans, methods and list of equipment to be utilized.

H. Description of the method to remove and dispose of the host pipe, if required.

I. The safety plan in conformance with the Contract Documents and OSHA regulations.

J. Contingency plans for the following potential conditions:
1. Unforeseen obstruction(s) causing burst stoppage, such as unanticipated change(s) in host pipe material, repair section(s), concrete encasement(s) or cradle(s), buried or abandoned manhole(s) or changes in direction not depicted on maps provided by the Contracting Authority.
2. Substantial surface heave occurs due to the depth of the existing pipe vs. the amount of upsizing.
3. Damage to existing service connections and to the replacement pipeline's structural integrity and methods of repair.
4. Damage to other existing utilities.
5. Loss of and return to line and grade.
6. Soil heaving or settlement.

3.18 Section 33 05 14 – Manholes and Structures

A. Shop Drawings: Indicate structure locations, elevations, piping, conduit, and invert sizes and elevations of penetrations.

B. Product Data: Submit manhole covers, component construction, features, configuration, dimensions and invert configuration.

3.19 Section 33 05 17 – Precast Concrete Valve Vaults and Meter Boxes

A. Shop Drawing: Indicate plan, location and inverts of connecting piping.

B. Product Data: Submit data on valve vaults and meter boxes.

C. Manufacturer’s Certificates: Submit Statement of Compliance, supporting data, from materials suppliers attesting that precast concrete valve vaults and meter boxes provided meet or exceed ASTM Standards and specification requirements.

D. Manufacturer’s Installation Instructions: Submit special procedures for precast concrete valve vaults and meter boxes installation.

3.20 Section 33 11 13 – Public Water Utility Distribution Piping

A. Product Data: Submit data on pipe materials, pipe fittings, valves and accessories.

B. Shop Drawings: Indicate piping layout, including piping specialties.

C. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

3.21 Section 33 12 00 – Water Utility Distribution Equipment

A. Product Data:
   1. Submit data on backflow preventer assemblies.
   2. Piping: Submit data on pipe materials, fittings, and accessories.
   3. Valves: Submit manufacturers catalog information with valve data and ratings for each service.
   4. Supports: Submit manufacturers catalog information including load capacity.

B. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

C. Manufacturer's Instructions: Submit installation instructions for backflow preventer assemblies, valves, and accessories.

3.22 Section 33 12 13 – Water Service Connections

A. Product Data: Submit data on pipe materials, pipe fittings, corporation stop assemblies, curb stop assemblies, meters, meter setting equipment, service saddles, backflow preventer, and accessories.

B. Shop Drawings: Provide shop drawings for precast concrete vaults to include detail drawings showing the vault and accessories.

C. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

3.23 Section 33 12 16 – Water Utility Distribution Valves

A. Shop Drawing:
   1. Installation Plan: Submit description of proposed installation.

B. Design Data: Submit manufacturer's latest published literature including illustrations, installation instructions, maintenance instructions and parts lists.

C. Manufacturer’s Certificates: Submit Statement of Compliance, supporting data, from material suppliers attesting that valves and accessories provided meet or exceed AWWA Standards and specification requirements.

3.24 Section 33 12 19 – Water Utility Distribution Fire Hydrant Assemblies

A. Shop Drawing:
   1. Installation Plan: Submit description of proposed installation.

B. Design Data: Submit manufacturer's latest published literature include illustrations, installation instructions, maintenance instructions and parts lists.

C. Manufacturer’s Certificates: Submit Statement of Compliance, supporting data, from material suppliers attesting that hydrants and accessories provided meet or exceed AWWA Standards and specification requirements.

3.25 Section 33 13 00 – Disinfecting of Water Utility Distribution

A. Product Data: Submit procedures, proposed chemicals, and treatment levels for review.

B. Test Reports: Indicate results comparative to specified requirements.

C. Certificate: Certify cleanliness of water distribution system meets or exceeds specified requirements.

3.26 Section 33 31 13 – Public Sanitary Utility Sewerage Piping

A. Product Data: Submit catalog cuts and other pertinent data indicating proposed materials, accessories, details, and construction information.

B. Submit reports indicating field tests made and results obtained.

C. Manufacturer's Installation Instructions:

D. Indicate special procedures required to install Products specified.

E. Submit detailed description of procedures for connecting new sewer to existing sewer line and directional drilling pipe jacking installation.

F. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

3.27 Section 33 31 13 – Public Sanitary Utility Sewerage Piping (Temporary Bypass Pipeline System)

A. Shop Drawings:
   1. Prepare a specific description of the proposed pipeline system and submit it for review and approval.
   2. Submit detailed plans and descriptions outlining all provisions and precautions to be taken by the Contractor regarding the handling of existing wastewater flows. Plan must be specific and complete to insure proper protection of the facilities. No construction shall begin until all provisions and requirements have been reviewed by the Engineer.

3. Plan shall include but not limited to details of the following:
   a. Sewer plugging method and types of plugs;
   b. Number, size, material, method of installation and location of installation of discharge piping;
   c. Downstream discharge plan;
   d. Method of protecting discharge manholes or structures from erosion and damage;
   e. Any thrust restraint locations;
   f. Any temporary pipe supports and anchoring required;
   g. Calculations of selection of bypass pipe size;
   h. Schedule for installation of and maintenance of bypass pumping lines;
   i. Indicate selection location of bypass pumping line locations.

END OF SECTION

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Quality control.

B. Tolerances.

C. References.

D. Labeling.

E. Testing and inspection services.

F. Manufacturers' field services.

1.2 QUALITY CONTROL

A. Monitor quality control over suppliers, manufacturers, products, services, Site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. When manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

D. Products, materials, and equipment may be subject to inspection by Engineer and Owner at place of manufacture or fabrication. Such inspections shall not relieve Contractor of complying with requirements of Contract Documents.

E. Supervise performance of Work in such manner and by such means to ensure that Work, whether completed or in progress, will not be subjected to harmful, dangerous, damaging, or otherwise deleterious exposure during construction period.

1.3 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' recommended tolerances and tolerance requirements in reference standards. When such tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

1.4 REFERENCES

A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of standard except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard by date of issue current as of date for receiving Bids except where specific date is established by code.

C. Obtain copies of standards and maintain on Site when required by product Specification Sections.

D. When requirements of indicated reference standards conflict with Contract Documents, request clarification from Engineer before proceeding.

E. Neither contractual relationships, duties, or responsibilities of parties in Contract nor those of Engineer shall be altered from Contract Documents by mention or inference in reference documents.

1.5 LABELING

A. Attach label from agency approved by authorities having jurisdiction for products, assemblies, and systems required to be labeled by applicable code.

B. Label Information: Include manufacturer's or fabricator's identification, approved agency identification, and the following information, as applicable, on each label:
   1. Model number.
   2. Serial number.
   3. Performance characteristics.

C. Manufacturer's Nameplates, Trademarks, Logos, and Other Identifying Marks on Products: Not allowed on surfaces exposed to view in public areas, interior or exterior.

1.6 TESTING AND INSPECTION SERVICES

A. Owner will employ and pay for specified services of an independent firm to perform testing and inspection.

B. Independent testing firm will perform tests, inspections, and other services specified in individual Specification Sections and as required by Engineer. In the event of a conflict in the Contract Documents concerning sampling and testing frequency, the more stringent standard shall be enforced, unless otherwise approved by the Engineer.
   1. Laboratory: Authorized to operate in State of Texas.
   2. Laboratory Staff: Maintain full-time Professional Engineer on staff to review services.
   3. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to National Bureau of Standards or accepted values of natural physical constants.

C. Testing, inspections, and source quality control may occur on or off Project Site. Perform off-Site testing as required by Engineer or Owner.

D. Cooperate with independent testing firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
   1. Notify Engineer and independent testing firm 48 hours before expected time for operations requiring services.
   2. Make arrangements with independent testing firm and pay for additional Samples and tests required for Contractor's use.

E. Testing and employment of testing agency or laboratory shall not relieve Contractor of obligation to perform Work according to requirements of Contract Documents.

F. Retesting or re-inspection required because of nonconformance with specified or indicated requirements shall be performed by same independent testing firm on instructions from Engineer. Payment for retesting or re-inspection will be charged to Contractor by deducting testing charges from Contract Sum/Price.

G. Independent Testing Firm Responsibilities:
   1. Test Samples of mixes submitted by Contractor.
   2. Provide qualified personnel at Site. Cooperate with Engineer and Contractor in performance of services.
   3. Perform indicated sampling and testing of products according to specified standards.
   4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   5. Promptly notify Engineer and Contractor of observed irregularities or nonconformance of Work or products.
   6. Perform additional tests required by Engineer.
   7. Attend preconstruction meetings and progress meetings.

H. Material Testing Reports: After each test, Independent Testing Firm shall promptly submit two copies of testing reports to Engineer, Contractor, and other entities as directed, indicating observations and results of tests and compliance or noncompliance with Contract Documents. At a minimum, include the following information in testing reports:
   1. Date issued.
   2. Project title and number.
   3. Name of inspector/testing technician.
   4. Date and time of sampling or inspection.
   5. Identification of product and Specification Section.
   6. Location in Project.
   7. Type of inspection or test.
   8. Date of test.
   9. Results of tests.
   10. Compliance or noncompliance with Contract Documents.
   11. Special observations, if any.

   Submit final report indicating correction of Work previously reported as noncompliant. Log all test results in an electronic spreadsheet for each test procedure and provide updated versions to Engineer at agreed upon time interval.

I. Limits on Independent Testing Firm:
   1. Independent Testing Firm may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Independent Testing Firm may not approve or accept any portion of the Work.

3. Independent Testing Firm may not assume duties of Contractor.
4. Independent Testing Firm has no authority to stop the Work.

1.7 MANUFACTURER'S FIELD SERVICES – Not Used

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION

3.1 Construction Material Lab Testing Matrix

Owner Employed Inspection Services			
Construction Operation	**Standard Specifications**	**Applicable Testing**	**Frequency of Testing**
Trenching	31 23 17	Laboratory Material Tests: ASTM D698 Compaction Density Tests: ASTM D2922 Compaction Moisture Tests: ASTM D3017	The in-place density/moisture content shall be tested and verified at an average frequency of once per 300 linear feet per lift along the trench line.
Flowable Fill	31 23 24	Perform inspection and testing in accordance with ASTM C94/C94M	Take samples for tests for every 150 cu yd of flowable fill, or fraction thereof, installed each day.
		Compressive Strength Test Cylinders in accordance with ASTM D4832	Sample, prepare, and test four (4) cylinders. Test one specimen at 3 days, one at 7 days, and two at 28 days. Measure temperature at point of deliver when samples are prepared.
		Perform in place penetration (density) tests using hand held penetrometer to measure penetration resistance of hardened flowable fill, in accordance with ASTM C403.	Perform tests at locations as directed by Engineer.

Owner Employed Inspection Services			
Construction Operation	**Standard Specifications**	**Applicable Testing**	**Frequency of Testing**
		Perform in-place density tests using nuclear test device, in accordance with ASTM C1040.	Perform tests at locations as directed by Engineer.
Flexible Base	32 11 23	Compaction testing will be performed in accordance with Texas Department of Transportation's Test Method Tex-113-E. Each course of flexible base shall be compacted to not less than 100 percent density. Field density determination shall be made in accordance with TxDOT Test Method Tex-115-E.	One test for every 1000 square yards of each course (layer) of compacted base material.
Hot Mix Asphaltic Concrete Paving	Project Notes	Asphalt Paving Mix Temperature	Measure temperature at time of placement.
		Asphalt Paving Thickness: ASTM D3549	Test one core sample from every 1000 square yards compacted paving
		Asphalt Paving Density: Tex-207-F	Test One core sample from every 1000 square yards or 1 per day (minimum) of compacted paving.
Concrete	Project Notes	1. Strength Test Samples: a. Sampling Procedures: ASTM C172 b. Cylinder Molding and Curing Procedures: ASTM C31, Cylinder Specimens, standard cured. 2. Field Testing:	Sample concrete and make one set of four cylinders for each class of concrete placed. Curb & Gutter, Fence, Gate, and Sidewalk (3,000 psi) – Make one set per every 25 cu yards or less Surface Area Paving and Driveways (4,000 psi) – make one set for every 2500 sq feet or less

Owner Employed Inspection Services			
Construction Operation	**Standard Specifications**	**Applicable Testing**	**Frequency of Testing**
		a. Slump Test Method: ASTM C143 b. Air Content Test Method: ASTM C173 c. Temperature Test Method: ASTM C1064 3. Cylinder Compressive Strength Testing: a. Test Method: ASTM C39	Measure Slump, Air Content and Temperature for each set of cylinders. Test one cylinder at 7 days. Test two cylinders at 28 days. Retain one cylinder for 28 days for testing when requested by Engineer. Dispose remaining cylinders when testing is not required.
Precast Concrete Valve Vaults and Meter Boxes	33 05 17	Compaction Testing: In accordance with ASTM D698	2 per vault

Contractor Inspection Services			
Construction Operation	**Standard Specifications**	**Applicable Testing**	**Frequency of Testing**
Trench Safety Systems	31 23 15		Contractor shall make daily inspection of trench safety systems to ensure that the systems meet OSHA requirements. Daily inspection shall be made by competent personnel. If evidence of possible cave-ins or slides is apparent, all work in the trench shall cease until necessary precautions have been taken to safeguard personnel entering trench. Contractor shall maintain permanent record of daily inspections.
Excavation	31 23 16		Request visual inspection of bearing surfaces by Engineer before installing subsequent work. The Engineer shall be notified not less than three working days prior to the visual inspection.
Pipe Bursting of Gravity Sewer Mains	33 01 37	Conduct closed circuit video inspection of completed work and submit summary report of final inspection with copy of video tape. Confirm service connections are complete and are unobstructed.	
Pipe Bursting of Potable Water Mains	33 01 38	See Paragraph 3.15 – Field Quality Control in Section 33 11 13.	

Contractor Inspection Services			
Construction Operation	**Standard Specifications**	**Applicable Testing**	**Frequency of Testing**
Public Water Utility Distribution Piping	33 11 13	See Paragraph 3.15 – Field Quality Control in Section 33 11 13.	Compaction Testing for Embedment shall be tested and verified at an average frequency of once per 300 linear feet per lift along the trench line.
Water Utility Distribution Equipment	33 12 00	Perform pressure test on all backflow pressure assemblies	
Water Service Connections	33 12 13	See Paragraph 3.11 – Field Quality Control in Section 33 12 13. Compaction Testing for Embedment and Backfill in accordance with ASTM D698.	Compaction Testing once per service.
Water Utility Distribution Valves	33 12 16	Perform pressure test on site water distribution system in accordance with Section 33 11 13.	
Water Utility Distribution Fire Hydrant Assemblies	33 12 19	Perform pressure test on site water distribution system in accordance with Section 33 11 13.	
Public Sanitary Utility Sewerage Piping	33 31 13	See Paragraph 3.3 – Field Quality Control is Section 33 01 32. Perform leakage and pressure tests of bypass piping using clean water prior to actual operation.	Compaction Testing for Embedment shall be tested and verified at an average frequency of once per 300 linear feet per lift along the trench line.

END OF SECTION

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Temporary Utilities:
   1. Temporary electricity.
   2. Temporary lighting for construction purposes.
   3. Temporary heating.
   4. Temporary ventilation.
   5. Temporary water service.
   6. Temporary sanitary facilities.

B. Construction Facilities:
   1. Field offices and sheds.
   2. Vehicular access.
   3. Parking.
   4. Progress cleaning and waste removal.
   5. Project identification.
   6. Traffic regulation.
   7. Fire-prevention facilities.

C. Temporary Controls:
   1. Barriers.
   2. Enclosures and fencing.
   3. Security.
   4. Water control.
   5. Dust control.
   6. Erosion and sediment control.
   7. Noise control.
   8. Pest and rodent control.
   9. Pollution control.

D. Removal of utilities, facilities, and controls.

1.2 REFERENCES

A. ASTM International:
   1. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
   2. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
   3. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

1.3 TEMPORARY ELECTRICITY

A. Provide and pay for power service required from utility source as needed for construction operation.

B. Provide temporary electric feeder from electrical service at location as directed by Engineer. Do not disrupt Owner's use of service.

C. Complement existing power service capacity and characteristics as required for construction operations.

D. Provide power outlets with branch wiring and distribution boxes located as required for construction operations. Provide suitable, flexible power cords as required for portable construction tools and equipment.

E. Provide main service disconnect and overcurrent protection at feeder switch at source distribution equipment.

F. Permanent convenience receptacles may be used during construction.

G. Provide distribution equipment, wiring, and outlets for single-phase branch circuits for power and lighting.
   1. Provide 20-ampere duplex outlets, single-phase circuits for power.
   2. Provide 20-ampere, single-phase branch circuits for lighting.

1.4 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

A. Provide and maintain lighting for construction operations.

B. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, lamps, and the like, for specified lighting levels.

C. Maintain lighting and provide routine repairs.

D. Permanent lighting may be used during construction.

1.5 TEMPORARY HEATING

A. Existing heating systems may be used during construction.

B. Before operating permanent equipment for temporary heating purposes, verify installation is approved for operation, equipment is lubricated, and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts. Replace filters at Substantial Completion.

C. Maintain minimum ambient temperature of 50 degrees F in areas where construction is in progress unless indicated otherwise in individual product Sections.

1.6 TEMPORARY VENTILATION

A. Ventilate enclosed areas to achieve curing of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

B. Use existing ventilation equipment. Extend and supplement equipment with temporary fan units as required to maintain clean air for construction operations.

1.7 TEMPORARY WATER SERVICE – Not Used

1.8 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Existing facility use is not permitted. Provide facilities at time of Project mobilization.

B. At end of construction, return existing facilities used for construction operations to same or better condition as original condition.

1.9 FIELD OFFICES AND SHEDS

A. Field Office: Weathertight, with lighting, electrical outlets, heating, cooling and ventilating equipment, and equipped with sturdy furniture including drawing display table.

B. Provide space for Project meetings, with table and chairs to accommodate six persons.

C. Locate field offices and sheds a minimum distance of 30 feet from existing and new structures.

D. Do not use permanent facilities for field offices or for storage.

E. Construction: Portable or mobile buildings, or buildings constructed with floors raised aboveground, securely fixed to foundations with steps and landings at entrance doors.
   1. Construction: Structurally sound, secure, weathertight enclosures for office and storage spaces. Maintain during progress of Work; remove enclosures when no longer needed.
   2. Thermal Resistance of Floors, Walls, and Ceilings: Compatible with occupancy and storage requirements.
   3. Exterior Materials: Weather-resistant, finished in one color acceptable to Engineer.
   4. Interior Materials in Field Offices: Sheet-type materials for walls and ceilings, prefinished or painted; resilient floors and bases.
   5. Interior Materials in Storage Sheds: As required to provide specified conditions for storage of products.

F. Environmental Control:
   1. Heating, Cooling, and Ventilating for Offices: Automatic equipment to maintain comfort conditions.
   2. Storage Spaces: Heating and ventilating as needed to maintain products according to Contract Documents; lighting for maintenance and inspection of products.

G. Storage Areas and Sheds: Size to storage requirements for products of individual Sections, allowing for access and orderly provision for maintenance and inspection of products to suit requirements in Section 01 60 00 - Product Requirements.

H. Preparation: Fill and grade Sites for temporary structures sloped for drainage away from buildings.

I. Installation:
   1. Install field office spaces ready for occupancy 15 days after date established by Owner-Contractor Agreement.
   2. Employee Residential Occupancy: Not allowed on Owner's property.

J. Maintenance and Cleaning:
   1. Weekly janitorial services for field offices; periodic cleaning and maintenance for sheds and storage areas.
   2. Maintain walks free of mud, water, snow, and the like.

K. Removal: At completion of Work remove buildings, foundations, utility services, and debris. Restore areas to same or better condition as original condition.

1.10 VEHICULAR ACCESS

A. Construct temporary all-weather access roads from public thoroughfares to serve construction area, of width and load-bearing capacity to accommodate unimpeded traffic for construction purposes.

B. Construct temporary bridges and culverts to span low areas and allow unimpeded drainage.

C. Extend and relocate vehicular access as Work progress requires and provide detours as necessary for unimpeded traffic flow.

D. Location as approved by Engineer.

E. Provide unimpeded access for emergency vehicles. Maintain 20 foot-wide driveways with turning space between and around combustible materials.

F. Provide and maintain access to fire hydrants and control valves free of obstructions.

G. Provide means of removing mud from vehicle wheels before entering streets.

H. Use designated existing on-Site roads for construction traffic.

1.11 PARKING

A. Construct temporary gravel surface parking areas to accommodate construction personnel.

B. Location as approved by Engineer.

C. If Site space is not adequate, provide additional off-Site parking.

D. Use of existing on-Site streets and driveways used for construction traffic is not permitted. Tracked vehicles are not allowed on paved areas.

E. Use of designated areas of existing parking facilities used by construction personnel is not permitted.

F. Do not allow heavy vehicles or construction equipment in parking areas.

G. Do not allow vehicle parking on existing pavement.

H. Designate one parking space for Engineer and Owner.

I. Permanent Pavements and Parking Facilities:
   1. Before Substantial Completion, bases for permanent roads and parking areas may be used for construction traffic.
   2. Avoid traffic loading beyond paving design capacity. Tracked vehicles are not allowed.
   3. Use of permanent parking structures is not permitted.

J. Maintenance:
   1. Maintain traffic and parking areas in sound condition free of excavated material, construction equipment, products, mud, snow, ice, and the like.
   2. Maintain existing and permanent paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original condition.

K. Removal, Repair:
   1. Remove temporary materials and construction before Substantial Completion.
   2. Remove underground Work and compacted materials to depth of 2 feet; fill and grade Site as indicated.
   3. Repair existing facilities damaged by use, to original condition.

L. Mud from Site vehicles: Provide means of removing mud from vehicle wheels before entering streets.

1.12 PROGRESS CLEANING AND WASTE REMOVAL

A. Maintain areas free of waste materials, debris, and rubbish. Maintain Site in clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, before enclosing spaces.

C. Broom and vacuum clean interior areas before starting surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and rubbish from Site periodically and dispose of off-Site.

E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

F. Comply with all applicable local, state, and federal requirements regarding excess and waste material, including methods of handling and disposal.

1.13 PROJECT IDENTIFICATION

A. Project Identification Sign:
   1. One painted sign, 32-sq ft area, bottom 4 feet aboveground.
   2. Content:
      a. Project number, title, logo, and name of Owner.
      b. Names and titles of authorities.
      c. Names and titles of Engineer and Consultants.
      d. Name of Prime Contractor.
   3. Graphic Design, Colors, and Style of Lettering: Designated by Engineer.

B. Project Informational Signs:
   1. Painted informational signs of same colors and lettering as Project identification sign or standard products; size lettering for legibility at 100-foot distance.
   2. Provide sign at each field office and storage shed, and provide directional signs to direct traffic into and within Site. Relocate as Work progress requires.
   3. No other signs are allowed without Owner's permission except those required by law.

C. Design sign and structure to withstand 70-mph wind velocity.

D. Sign Painter: Experienced as professional sign painter for minimum of three years.

E. Finishes, Painting: Adequate to withstand weathering, fading, and chipping for duration of construction.

F. Show content, layout, lettering, color, foundation, structure, sizes, and grades of members.

G. Sign Materials:
   1. Structure and Framing: New wood, structurally adequate.
   2. Sign Surfaces: Exterior grade plywood with medium-density overlay, minimum of 3/4 inches thick, standard large sizes to minimize joints.
   3. Rough Hardware: Galvanized.
   4. Paint and Primers: Exterior quality, two coats; sign background of color as selected.
   5. Lettering: Exterior quality paint, contrasting colors as selected.

H. Installation:
   1. Install Project identification sign within 15 days after date established by Notice to Proceed.
   2. Erect at designated location.
   3. Erect supports and framing on secure foundation, rigidly braced and framed to resist wind loadings.
   4. Install sign surface plumb and level, with butt joints. Anchor securely.
   5. Paint exposed surfaces of sign, supports, and framing.

I. Maintenance: Maintain clean signs and supports; repair deterioration and damage.

J. Removal: Remove signs, framing, supports, and foundations at completion of Project and restore area.

1.14 TRAFFIC REGULATION

A. Signs, Signals, and Devices:
   1. Post-Mounted and Wall-Mounted Traffic Control and Informational Signs: As approved by authorities having jurisdiction.
   2. Traffic Control Signals: As approved by local jurisdictions.
   3. Traffic Cones, Drums, Flares, and Lights: As approved by authorities having jurisdiction.
   4. Flag Person Equipment: As required by authorities having jurisdiction.

B. Flag Persons: Provide trained and equipped flag persons to regulate traffic when construction operations or traffic encroach on public traffic lanes.

C. Flares and Lights: Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.

D. Haul Routes:
   1. Consult with authorities having jurisdiction and establish public thoroughfares to be used for haul routes and Site access.
   2. Confine construction traffic to designated haul routes.
   3. Provide traffic control at critical areas of haul routes to regulate traffic and to minimize interference with public traffic.

E. Traffic Signs and Signals:
   1. Provide signs at approaches to Site and on Site, at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.
   2. Provide, operate, and maintain traffic control signals to direct and maintain orderly flow of traffic in areas under Contractor's control and areas affected by Contractor's operations.
   3. Relocate signs and signals as Work progresses, to maintain effective traffic control.

F. Removal:
   1. Remove equipment and devices when no longer required.
   2. Repair damage caused by installation.
   3. Remove post settings to depth of 2 feet.

1.15 FIRE-PREVENTION FACILITIES

A. Prohibit smoking within buildings under construction and demolition. Designate area on Site where smoking is permitted. Provide approved ashtrays in designated smoking areas.

B. Establish fire watch for cutting, welding, and other hazardous operations capable of starting fires. Maintain fire watch before, during, and after hazardous operations until threat of fire does not exist.

C. Portable Fire Extinguishers: NFPA 10; 10-pound capacity, 4A-60B: C UL rating.
   1. Provide one fire extinguisher at each facility.
   2. Provide minimum of one fire extinguisher in every construction trailer and storage shed.

3. Provide minimum of one fire extinguisher on roof during roofing operations using heat-producing equipment.

1.16 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to allow for Owner's use of Site, and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Provide barricades and covered walkways required by authorities having jurisdiction for public rights-of-way.

C. Tree and Plant Protection: Preserve and protect existing trees and plants designated to remain.
   1. Protect areas within drip lines from traffic, parking, storage, dumping, chemically injurious materials and liquids, ponding, and continuous running water.
   2. Provide 4-foot-high barriers around drip line, with access for maintenance.
   3. Replace trees and plants damaged by construction operations.

D. Protect non-owned vehicular traffic, stored materials, Site, and structures from damage.

1.17 ENCLOSURES AND FENCING

A. Construction: Commercial-grade chain-link fence or orange plastic construction netting.

B. Provide 6-foot-high fence around construction Site; equip with vehicular and pedestrian gates with locks.

C. Provide orange plastic construction netting around open excavations.

D. Exterior Enclosures:
   1. Provide temporary weathertight closure of exterior openings to accommodate acceptable working conditions and protection for products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual Specification Sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

1.18 SECURITY

A. Security Program:
   1. Protect Work premises from theft, vandalism, and unauthorized entry.
   2. Initiate program at Project mobilization.
   3. Maintain program throughout construction period until directed by Engineer.

B. Entry Control:
   1. Restrict entrance of persons and vehicles to Project Site.
   2. Allow entrance only to authorized persons with proper identification.
   3. Maintain log of workers and visitors and make available to Owner on request.
   4. Coordinate access of Owner's personnel to Site in coordination with Owner's security forces.

C. Personnel Identification:
   1. Provide identification badge for each person authorized to enter premises.
   2. Badge to Include: Personal photograph, name, and employer.
   3. Maintain list of accredited persons and submit copy to Owner on request.
   4. Require return of badges at expiration of employment on the Work.

D. Restrictions:
   1. Do not allow cameras on Site or photographs taken except by written approval of Owner.
   2. Do no work on Saturdays or Sundays without approval of Owner.

1.19 WATER CONTROL

A. Grade Site to drain. Maintain excavations free of water. Provide, operate, and maintain necessary pumping equipment.

B. Protect Site from puddles or running water. Provide water barriers as required to protect Site from soil erosion.

1.20 DUST CONTROL

A. Execute Work by methods that minimize raising dust from construction operations.

B. Provide positive means to prevent airborne dust from dispersing into atmosphere.

1.21 EROSION AND SEDIMENT CONTROL

A. Plan and execute construction by methods to control surface drainage from cuts and fills from borrow and waste disposal areas. Prevent erosion and sedimentation.

B. Minimize surface area of bare soil exposed at one time.

C. Provide temporary measures including berms, dikes, drains, and other devices to prevent water flow.

D. Construct fill and waste areas by selective placement to avoid erosive surface silts and clays.

E. Periodically inspect earthwork to detect evidence of erosion and sedimentation. Promptly apply corrective measures.

1.22 NOISE CONTROL

A. Provide methods, means, and facilities to minimize noise produced by construction operations.

1.23 PEST AND RODENT CONTROL

A. Provide methods, means, and facilities to prevent pests and insects from damaging the Work.

B. Provide methods, means, and facilities to prevent rodents from accessing or invading premises.

1.24 POLLUTION CONTROL

A. Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances and pollutants produced by construction operations.

B. Comply with pollution and environmental control requirements of authorities having jurisdiction.

C. Control dust caused by the work and comply with pollution control regulations of governing authorities. Sprinkling or similar methods will be permitted to control dust. Use of petroleum products or chlorides is prohibited. Sprinkling must be repeated as needed to keep the disturbed area damp. Dust control shall be performed as the work proceeds whenever a potential for dust nuisance or hazard occurs.

D. Burning is not allowed on this project.

E. Blasting is not allowed on this project.

1.25 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, and materials before Final Application for Payment inspection.

B. Remove underground installations to minimum depth of 2 feet. Grade Site as indicated on Drawings.

C. Clean and repair damage caused by installation or use of temporary Work.

D. Restore existing and permanent facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Products.

B. Product delivery requirements.

C. Product storage and handling requirements.

D. Product options.

E. Equipment electrical characteristics and components.

F. Product substitutions and procedures.

1.2 PRODUCTS

A. Specified products define standard of quality, type, function, dimension, appearance, and performance required.

B. Furnish products of qualified manufacturers that are suitable for intended use. Furnish products of each type by single manufacturer unless specified otherwise. Confirm that manufacturer's production capacity can provide sufficient product, on time, to meet Project requirements.

C. Domestic Products: Except where specified otherwise, domestic products are required and interpreted to mean products mined, manufactured, fabricated, or produced in United States or its territories.

D. Do not use materials and equipment removed from existing premises except as specifically permitted by Contract Documents.

E. Furnish interchangeable components from same manufacturer for components being replaced.

1.3 PRODUCT DELIVERY REQUIREMENTS

A. Transport and handle products according to manufacturer's instructions.

B. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.

C. Provide equipment and personnel to handle products; use methods to prevent soiling, disfigurement, or damage.

1.4 PRODUCT STORAGE AND HANDLING REQUIREMENTS

A. Store and protect products according to manufacturer's instructions.

B. Store products with seals and labels intact and legible.

C. Store sensitive products in weathertight, climate-controlled enclosures in an environment suitable to product.

D. For exterior storage of fabricated products, place products on sloped supports aboveground.

E. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

F. Store loose granular materials on solid flat surfaces in well-drained area. Prevent mixing with foreign matter.

G. Provide equipment and personnel to store products; use methods to prevent soiling, disfigurement, or damage.

H. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

1.5 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Products complying with specified reference standards or description.

B. Products Specified by Naming One or More Manufacturers: Products of one of manufacturers named and complying with Specifications; no options or substitutions allowed.

PART 2 PRODUCTS

2.1 EQUIPMENT ELECTRICAL CHARACTERISTICS AND COMPONENTS – Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01 70 00 - EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Field engineering.

B. Closeout procedures.

C. Starting of systems.

D. Demonstration and instructions.

E. Minimum start up requirements.

F. Project record documents.

G. Operation and maintenance data.

H. Manual for materials and finishes.

I. Manual for equipment and systems.

J. Spare parts and maintenance products.

K. Product warranties and product bonds.

L. Maintenance service.

M. Examination.

N. Preparation.

O. Execution.

P. Cutting and patching.

Q. Protecting installed construction.

R. Final cleaning.

1.2 FIELD ENGINEERING

A. Owner will locate and Contractor shall protect survey control and reference points. Promptly notify Engineer of discrepancies discovered.

B. Control datum for survey is established by Owner-provided survey indicated on Drawings.

C. Contractor shall verify setbacks; confirm Drawing dimensions and elevations.

D. Protect survey control points prior to starting Site Work; preserve permanent reference points during construction.

E. Promptly report to Engineer loss or destruction of reference point or relocation required because of changes in grades or other reasons.

F. Contractor shall retain Engineer to replace dislocated survey control points based on original survey control.

1.3 CLOSEOUT PROCEDURES

A. Prerequisites to Substantial Completion: Complete following items before requesting Certification of Substantial Completion, either for entire Work or for portions of Work:
   1. Submit maintenance manuals, Project record documents, digital images of construction photographs, and other similar final record data in compliance with this Section.
   2. Complete facility startup, testing, adjusting, balancing of systems and equipment, demonstrations, and instructions to Owner's operating and maintenance personnel as specified in compliance with this Section.
   3. Conduct inspection to establish basis for request that Work is substantially complete. Create comprehensive list (initial punch list) indicating items to be completed or corrected, value of incomplete or nonconforming Work, reason for being incomplete, and date of anticipated completion for each item. Include copy of list with request for Certificate of Substantial Completion.
   4. Obtain and submit releases enabling Owner's full, unrestricted use of Project and access to services and utilities. Include certificate of occupancy, operating certificates, and similar releases from authorities having jurisdiction and utility companies.
   5. Deliver tools, spare parts, extra stocks of material, and similar physical items to Owner.
   6. Make final change-over of locks and transmit keys directly to Owner. Advise Owner's personnel of change-over in security provisions.
   7. Discontinue or change over and remove temporary facilities and services from Project Site, along with construction tools, mockups, and similar elements.
   8. Perform final cleaning according to this Section.

B. Prerequisites for Final Completion: Complete following items before requesting final acceptance and final payment.
   1. When Contractor considers Work to be complete, submit written certification that:
      a. Contract Documents have been reviewed.
      b. Work has been examined for compliance with Contract Documents.
      c. Work has been completed according to Contract Documents.
      d. Work is completed and ready for final inspection.
   2. Submittals: Submit following:
      a. Final punch list indicating all items have been completed or corrected.
      b. Final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
      c. Specified warranties, workmanship/maintenance bonds, maintenance agreements, and other similar documents.
      d. Accounting statement for final changes to Contract Sum.
      e. Contractor's affidavit of payment of debts and claims on Contractor's Affidavit of Payment of Debts and Claims.

f. Contractor affidavit of release of liens on Contractor's Affidavit of Release of Liens.
g. Consent of surety to final payment on Consent of Surety to Final Payment Form.

3. Perform final cleaning for Contractor-soiled areas according to this Section.

1.4 STARTING OF SYSTEMS – Not Used

1.5 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. Use operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.

D. Demonstrate startup, operation, control, adjustment, troubleshooting, servicing, maintenance, and shutdown of each item of equipment at agreed time, at designated location.

E. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

F. Required instruction time for each item of equipment and system is specified in individual Specification Sections.

G. Required instruction time for each item of equipment and system is specified in individual sections. The manufacturer's instructor shall present at least one "hands-on" demonstration of common corrective maintenance repairs so that all operation and maintenance personnel have the opportunity to witness the demonstration. The manufacturer shall provide the tools and equipment to conduct the demonstrations.

H. In any "hands-on" training situation where Owner's operation or maintenance personnel participate in disassembly or assembly of equipment components, the manufacturer shall be responsible for such disassembly or assembly and shall provide written certification of proper equipment operation to the Engineer.

1.6 MINIMUM START UP REQUIREMENTS

A. Valves.
1. Inspect hand and automatic control valves, clean bonnets and stems.
2. Tighten packing glands to assure no leakage, but permit valve stems to operate without galling.
3. Replace packing in valves to retain maximum adjustment after system is judged complete.
4. Replace packing on any valve which continues to leak.
5. Remove and repair bonnets which leak.
6. Coat packing gland threads and valve stems with a surface preparation of "Moly-Cote" or "Mallow-Pro", after cleaning.

B. Verify that control valve seats are free from foreign material, and are properly positioned for intended use.

C. Tighten all pipe joints after system has been placed in operation. Replace gaskets which show any sign of leakage after tightening.

D. Inspect all joints for leakage.
   1. Promptly remake each joint which appears to be faulty, do not wait for rust to form.
   2. Clean threads on both parts, apply compound and remake joints.

E. Remove rust, scale and foreign material from equipment and renew defaced surfaces.

F. Vent gasses trapped in any part of systems. Verify that liquids are drained from all parts of gas or air systems.

G. Reports to Engineer indicating observations and results of tests and indicating compliance or non-compliance with requirements of Contract Documents.

1.7 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.
   6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress, not less than weekly.

E. Specifications: Legibly mark and record, at each product Section, description of actual products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates used.
   3. Changes made by Addenda and modifications.

F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction as follows:
   1. Include Contract modifications such as Addenda, supplementary instructions, change directives, field orders, minor changes in the Work, and change orders.
   2. Include locations of concealed elements of the Work.
   3. Identify depth of buried utility lines and provide dimensions showing distances from permanent facility components that are parallel to utilities.
   4. Dimension ends, corners, and junctions of buried utilities to permanent facility components using triangulation.

5. Identify and locate existing buried or concealed items encountered during Project.
6. Measured depths of foundations in relation to vertical datum.
7. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
8. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
9. Field changes of dimension and detail.
10. Details not on original Drawings.

G. Submit marked-up paper copy documents to Engineer with claim for final Application for Payment.

H. Submit PDF electronic files of marked-up documents to Engineer with claim for final Application for Payment.

1.8 OPERATION AND MAINTENANCE DATA – Not Used

1.9 MANUAL FOR MATERIALS AND FINISHES – Not Used

1.10 MANUAL FOR EQUIPMENT AND SYSTEMS – Not Used

1.11 SPARE PARTS AND MAINTENANCE PRODUCTS – Not Used

1.12 PRODUCT WARRANTIES AND PRODUCT BONDS

A. Obtain warranties and bonds executed in duplicate by responsible Subcontractors, suppliers, and manufacturers within ten days after completion of applicable item of Work.

B. Execute and assemble transferable warranty documents and bonds from Subcontractors, suppliers, and manufacturers.

C. Verify documents are in proper form, contain full information, and are notarized.

D. Co-execute submittals when required.

E. Include table of contents and assemble in three D side ring binder with durable plastic cover.

F. Submit prior to final Application for Payment.

G. Time of Submittals:
1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.
2. Make other submittals within ten days after date of Substantial Completion, prior to final Application for Payment.
3. For items of Work for which acceptance is delayed beyond Substantial Completion, submit within ten days after acceptance, listing date of acceptance as beginning of warranty or bond period.

1.13 MAINTENANCE SERVICE

A. Furnish service and maintenance of components indicated in Specification Sections for one year from date of Substantial Completion.

B. Examine system components at frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

C. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by manufacturer of original component.

D. Do not assign or transfer maintenance service to agent or Subcontractor without prior written consent of Owner.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that existing Site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new Work being applied or attached.

C. Examine and verify specific conditions described in individual Specification Sections.

D. Verify that utility services are available with correct characteristics and in correct locations.

3.2 PREPARATION – Not Used

3.3 EXECUTION

A. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.

B. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

C. Verify that field measurements are as indicated on approved Shop Drawings or as instructed by manufacturer.

D. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.
   1. Secure Work true to line and level and within specified tolerances, or if not specified, industry-recognized tolerances.

E. Allow for expansion of materials.

F. Climatic Conditions and Project Status: Install each unit of Work under conditions to ensure best possible results in coordination with entire Project.
   1. Isolate each unit of Work from incompatible Work as necessary to prevent deterioration.
   2. Coordinate enclosure of Work with required inspections and tests to minimize necessity of uncovering Work for those purposes.

G. Mounting Heights: Where not indicated, mount individual units of Work at industry recognized standard mounting heights for particular application indicated.
   1. Refer questionable mounting heights choices to Engineer for final decision.

H. Adjust operating products and equipment to ensure smooth and unhindered operation.

I. Clean and perform maintenance on installed Work as frequently as necessary through remainder of construction period. Lubricate operable components as recommended by manufacturer.

3.4 CUTTING AND PATCHING

A. Employ skilled and experienced installers to perform cutting and patching.

B. Submit written request in advance of cutting or altering elements affecting:
   1. Structural integrity of element.
   2. Integrity of weather-exposed or moisture-resistant elements.
   3. Efficiency, maintenance, or safety of element.
   4. Visual qualities of sight-exposed elements.
   5. Work of Owner or separate contractor.

C. Execute cutting, fitting, and patching including excavation and fill to complete Work and to:
   1. Fit the several parts together, to integrate with other Work.
   2. Uncover Work to install or correct ill-timed Work.
   3. Remove and replace defective and nonconforming Work.
   4. Remove samples of installed Work for testing.
   5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.

D. Execute Work by methods to avoid damage to other Work and to provide proper surfaces to receive patching and finishing.

E. Cut masonry and concrete materials using masonry saw or core drill.

F. Restore Work with new products according to requirements of Contract Documents.

G. Fit Work tight to pipes, sleeves, ducts, conduits, and other penetrations through surfaces.

H. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.

I. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for assembly, refinish entire unit.

J. Identify hazardous substances or conditions exposed during the Work to Engineer for decision or remedy.

3.5 PROTECTING INSTALLED CONSTRUCTION

A. Protect installed Work and provide special protection where specified in individual Specification Sections.

B. Provide temporary and removable protection for installed products. Control activity in immediate Work area to prevent damage.

C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

D. Use durable sheet materials to protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects.

E. Prohibit traffic or storage upon waterproofed or roofed surfaces. When traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

F. Prohibit traffic from landscaped areas.

3.6 FINAL CLEANING

A. Execute final cleaning prior to final Project assessment.

B. Clean interior and exterior glass and surfaces exposed to view; remove temporary labels, stains, and foreign substances; polish transparent and glossy surfaces; and vacuum carpeted and soft surfaces.

C. Clean equipment and fixtures to sanitary condition with appropriate cleaning materials.

D. Clean debris from gutters and drainage systems.

E. Clean Site; sweep paved areas, rake clean landscaped surfaces.

F. Remove waste and surplus materials, rubbish, and construction facilities from Site.

END OF SECTION

SECTION 31 05 13 - SOILS FOR EARTHWORK

PART 1 GENERAL

1.1 SUMMARY

A. Description: This item shall consist of required excavation, removal and proper utilization of materials secured from sources obtained by the Contractor and approved by the Engineer.

Borrow will be resorted to only when indicated or directed by the Engineer and then only from approved sources.

B. Section Includes:
1. Borrow.
2. Subsoil materials (excavated material from on-site).
3. Topsoil materials.

1.2 UNIT PRICES - MEASUREMENT AND PAYMENT – Not Used

1.3 REFERENCES

A. American Association of State Highway and Transportation Officials:
1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.

B. ASTM International:
1. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).
2. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
3. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).

1.4 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures: Requirements for submittals.

1.5 QUALITY ASSURANCE

A. Furnish each subsoil and topsoil material from single source throughout the Work, unless directed otherwise by Engineer.

B. Perform Work in accordance with Texas Department of Transportation's Standard Specifications for Construction of Highways, Streets, and Bridges (latest Edition).

C. Maintain one copy of Texas Department of Transportation's Standard Specifications for Construction of Highways, Streets, and Bridges (latest Edition) on site.

PART 2 PRODUCTS

2.1 SUBSOIL MATERIALS

A. Subsoil Type S1 (Select Fill, or Select Borrow): This material shall consist of sand or other suitable granular material, free from vegetation or deleterious or objectionable matter reasonably free from lumps of earth and when tested by standard TxDOT laboratory methods, shall meet the following requirements:
   1. The Liquid Limits shall not exceed 35.
   2. The Plasticity Index shall not be less than 4 nor more than 15.
   3. Minimum and maximum passing No. 200 sieve: 10% and 70%, respectively.
   4. No rocks greater than 2 inches in diameter.

B. Subsoil Type S2 (Borrow):
   1. This material shall consist of suitable nonswelling (soils with plasticity index less than 20) earth material such as loam, clay or other such materials that will form a stable embankment.
   2. This material shall be free of lumps larger than 3 inches in diameter, and rocks larger than 4 inches in diameter.

C. Subsoil Type S3 (On-Site Material):
   1. This material shall be excavated from on-site and re-used for fills (embankment).
   2. This material shall be free of lumps larger than 3 inches in diameter, and rocks larger than 4 inches in diameter.

2.2 TOPSOIL MATERIALS

A. Topsoil Type S4:
   1. This material shall consist of approved topsoil material and shall be clean, friable, loamy soil capable of supporting plant life
   2. This material can be excavated and reused material from on-site sources, or imported from an approved off-site source.
   3. Reasonably free of roots, rocks larger than 1/2 inch, subsoil, debris, large weeds, and foreign matter.
   4. Acidity range (pH) of 5.5 to 7.5.
   5. Containing minimum of 4 percent and maximum of 25 percent inorganic matter.
   6. Conforming to ASTM D2487 Group Symbol OH or PT.
   7. Limit decaying matter to 10 percent of total content by volume.

2.3 SOURCE QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Testing and Inspection Services Testing and analysis of soil material.

B. When tests indicate materials do not meet specified requirements, change material and retest.

C. Furnish materials of each type from same source throughout the Work, unless otherwise approved by Engineer.

PART 3 EXECUTION

3.1 EXCAVATION

A. Prior to commencing this work, all erosion control measures required shall be in place.

B. All suitable materials removed from excavations shall be used, insofar as practicable in the formation of embankments, Fill, or otherwise be utilized as indicated or as directed by the Engineer and completed work shall conform to the established alignment, grades and cross section.

C. Excavate subsoil and topsoil from areas designated. Strip topsoil to full depth of topsoil in designated areas.

D. Stockpile excavated material meeting requirements for subsoil materials and topsoil materials.

E. Remove excess excavated materials, subsoil, and topsoil not intended for reuse, from site.

F. Remove excavated materials not meeting requirements for subsoil materials and topsoil materials from site.

3.2 STOCKPILING

A. Stockpile materials on site at locations designated or approved by Engineer.

B. Stockpile in sufficient quantities to meet Project schedule and requirements.

C. Separate differing materials with dividers or stockpile apart to prevent mixing.

D. Stockpile topsoil to only a height which yields safe slope stability.

E. Prevent intermixing of soil types or contamination.

F. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.

3.3 STOCKPILE CLEANUP

A. Remove stockpile, leave area in clean and neat condition. Grade site surface to prevent free standing surface water.

B. When borrow area is indicated, leave area in clean and neat condition. Grade site surface to prevent free standing surface water.

END OF SECTION

SECTION 31 23 15 - TRENCH SAFETY SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Furnishing all equipment, materials and labor for a trench safety system meeting appropriate requirements established in Occupational Safety and Health Administration (OSHA) Safety and Health Regulations, 29 CFR Part 1926, OSHA Standards – Excavations; Final Rule, October 31, 1989. In the event of conflict of published and proposed rules, the more stringent requirement shall be used.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Trench Safety Plan:
   1. Basis of Measurement: Trench Safety Plan shall be measured by the lump sum for the project.
   2. Basis of Payment: Payment for Trench Safety Plan shall be made at the lump sum bid for Trench Safety Plan. Payment for all work prescribed under this item shall be full compensation for the Trench Safety Plan including acquisition of soils information and design of trench safety system, by a professional engineer registered in the State of Texas.

B. Trench Safety Implementation:
   1. Basis of Measurement: Trench Safety Implementation shall be measured by the linear foot for the project.
   2. Basis of Payment: Payment for Trench Safety Implementation shall be made at the unit price bid for Trench Safety Implementation. Payment for all work prescribed under this item shall be full compensation for the Trench Safety System including any additional excavation and backfill required, for furnishing, placing, maintaining and removing all shoring, sheeting, or bracing; for dewatering or diversion of water; for all jacking and jack removal; and for all other labor, materials, tools, equipment, and incidentals necessary to complete the work.

1.3 REFERENCES

A. Federal Occupational Safety and Health Administration (OSHA) Standards – 29 CFR, Part 1926, Subpart P, as amended, including Proposed Rules published in the Federal Register (Vol. 52, No. 72) on April 15, 1987; Sections 1926-650 through 1926-653.

B. Texas Legislature House Bill No. 662 and House Bill No. 665 with regard to Trench Safety Systems.

1.4 DEFINITIONS

A. Trench: A trench shall be defined as a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width.

1.5 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures: Requirements for submittals.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with OSHA Regulations, 29 CFR Part 1926, OSHA Standards.

B. Maintain one copy of OSHA Standards on site.

1.7 QUALIFICATIONS

A. Prepare Trench Safety Plan under direct supervision of Professional Engineer experienced in design of this Work and licensed in State of Texas.

1.8 COORDINATION – Not Used

PART 2 PRODUCTS

2.1 TIMBER

A. Trench sheeting materials shall be a minimum of 2 inches in thickness, solid and sound, free from weakening defects such as loose knots and splits. Shoring timber sizes shall not be less than that called for on the Trench Safety Plan.

2.2 STEEL SHEET PILING

A. Steel sheet piling shall conform to ASTM A36.

B. Steel for stringers and cross braces shall conform to ASTM A36.

2.3 TRENCH BOXES

A. Portable trench boxes shall be constructed of steel conforming to ASTM A36. Connecting bolts shall conform to ASTM A307. Welds shall conform to requirements of AWS Specification D1.1.

PART 3 EXECUTION

3.1 GENERAL

A. Trench safety systems shall be constructed, installed and maintained in accordance with the design prepared by the Contractor’s registered Professional Engineer licensed to practice in the State of Texas to prevent death or injury to personnel or damage to structures in or near these trench excavations. Materials excavated from trench to be stored no closer to the edge of trench than 1/2 the depth of the trench.

3.2 INSTALLATION

A. Timber Sheeting: Timber sheeting to be installed in accordance with detail shown on plans. Drive timber sheeting to a depth below trench bottom as shown on plans. Size of uprights, stringers and cross bracing to be in accordance with details shown on plans. Place cross braces in true horizontal position, spaced vertically, and secured to prevent sliding, falling or kickouts.

B. Steel Sheet Piling: Steel sheet piling of equal or greater strength may be substituted for timber trench shoring shown on the plans. Contractor to provide certification that steel sheet piling substituted provides equal or greater protection than timber trench shoring shown on plans. Certification of steel sheet piling to be provided by registered Professional Engineer. Drive steel sheet piling to a minimum depth below trench bottom as recommended by Contractor's registered Professional Engineer licensed to practice in Texas providing design. Place cross braces in true horizontal position, spaced vertically and secured to prevent sliding, falling or kickouts.

C. Trench Boxes: Portable trench box to be substituted for timber trench shoring shown on plans shall be designed or the design checked by Contractor's registered Professional Engineer licensed to practice in Texas. Design trench box to provide equal or greater protection than timber trench shoring shown on plans. Certification of the design of trench boxes shall be provided by Contractor prior to its use on project. In cases where top of portable trench box will be below to top of trench, the trench must be sloped to an angle greater than the angle of repose for the soil conditions existing on the project. In areas where sloped trench will affect the integrity of existing structures, Contractor to protect structures prior to sloping trench.

D. Trench Jacks: When trench jacks are used for cross bracing and/or stringers, the Contractor shall provide certification by a registered Professional Engineer licensed to practice in Texas that the trench jacks provide protection greater than or equal to the timber cross bracing shown on plans.

3.3 SUPERVISION

A. Contractor shall provide competent supervisory personnel at each trench while work is in progress to ensure Contractor's methods, procedures, equipment and materials pertaining to the safety systems in this item are sufficient to meet requirements of OSHA Standards.

3.4 MAINTENANCE OF SAFETY SYSTEM

A. The safety system shall be maintained in the condition as shown on plans or as specified by the Contractor's registered Professional Engineer licensed to practice in Texas. The Contractor shall take all necessary precaution to ensure the safety systems are not damaged during their use. If ay any time during its use a safety system is damaged, personnel shall be immediately removed from the trench or excavation area and the safety system repaired. The Contractor shall take all necessary precautions to ensure no loads, except those included in the safety system design, are imposed upon the excavation.

3.5 REMOVAL

A. Bed and backfill pipe to a point at least one foot above top of pipe prior to removal of any portion of trench safety systems. Bedding and backfill shall be in accordance to other applicable specification items. Backfilling removal of trench supports shall progress together from bottom of trench upward. Remove no braces or trench supports until all personnel have evacuated the trench. Backfill trench to within 4 feet of natural ground prior to removal of entire trench safety systems.

3.6 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.

3.7 PROTECTION OF FINISHED WORK

A. Section 01 70 00 - Execution and Closeout Requirements: Protecting finished work.

END OF SECTION

SECTION 31 23 16 - EXCAVATION

PART 1 GENERAL

1.1 SUMMARY

A. Description: This item shall consist of excavating and properly utilizing or otherwise satisfactorily disposing of all excavated material, of whatever character, within the limits of the work indicated and the constructing, compacting, shaping and finishing of all earthwork on the entire project in accordance with the specification requirements herein outlined and in conformity with the required lines, grades and typical cross sections indicated or as directed by the Engineer. **All excavation shall be unclassified and shall include all materials encountered regardless of their nature or the manner in which they are removed.**

B. Section Includes:
   1. Soil densification.
   2. Excavating for structures and foundations.
   3. Excavating for paving, roads, and parking areas.
   4. Excavating for slabs-on-grade.
   5. Excavating for site structures.
   6. Excavating for landscaping.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT – Not Used

1.3 REFERENCES

A. Local utility standards when working within 24 inches of utility lines.

1.4 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures: Requirements for submittals.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 PREPARATION

A. Prior to commencing this work, all erosion control and tree protection measures shall be in place.

B. Construction equipment shall not be operated within the drip line of trees, unless indicated.

C. Construction materials shall not be stockpiled under the canopies of trees. No excavation or embankment shall be placed within the drip line of trees until tree wells are constructed as indicated on the Drawings.

D. Call Texas 811 service at 800-344-8377 not less than three working days before performing Work.
   1. Request underground utilities to be located and marked within and surrounding construction areas.

E. Call Local Municipality(ies) not less than 2 weeks before performing Work.
   1. Request underground utilities to be located and marked within and surrounding construction areas.

F. Notify utility company(ies) to remove and relocate utilities as indicated on the Drawings.

G. Protect utilities indicated to remain from damage.

H. Protect plant life, lawns, rock outcroppings and other features remaining as portion of final landscaping.

I. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

3.2 EXCAVATION

A. All excavation shall be performed as specified herein and shall conform to the established alignment, grades and cross sections.

B. Suitable excavated on-site materials (Subsoil Type S3) may be utilized, insofar as practicable and when the material meets the criteria outlined in Section 31 05 13, Soils for Earthwork, in constructing required embankments and fill areas.

C. Materials with a Plasticity Index (PI) greater than the surrounding materials or with a moisture content greater than 2 percent in excess of optimum shall be classified as unsuitable and must be manipulated to meet the above criteria before use or be removed.

D. Unsuitable excavated materials or excavation in excess of that needed for construction shall be known as Waste and shall become the property of the Contractor. It shall become his sole responsibility to dispose of this material off the limits of the right of way in an environmentally sound manner at a permitted disposal site.

E. Underpin adjacent structures which may be damaged by excavation work.

F. The Contractor will be required to set blue-tops for the subgrade.

G. Excavate subsoil to the final subgrade elevation(s) to accommodate structural foundations, slabs-on-grade, paving, site structures, and civil site facilities.

H. Grade top perimeter of excavation to prevent surface water from draining into excavation.

I. Trim excavation. Remove loose matter.

J. Remove lumped subsoil, boulders, and rock up to 1/3 cu yd measured by volume.

K. Notify Engineer of unexpected subsurface conditions.

L. Correct areas over excavated with Structural Fill.

M. Remove excess and unsuitable material from site.

N. Stockpile subsoil in area designated on site to depth not exceeding 8 feet and protect from erosion.

O. Repair or replace items indicated to remain damaged by excavation.

3.3 SUBGRADE PREPARATION FOR STRUCTURES AND PAVEMENTS

A. After final subgrade elevation has been achieved, the exposed subgrade soils (subsoils) shall be scarified to a minimum depth of 6 inches. Compaction of the subsoil shall be to a minimum of 95% and less than 100% of its maximum dry density when determined in accordance with ASTM D698, Method D, Standard Proctor. The subsoil shall be no less than its optimum moisture to no greater than 3 percentage points above its optimum moisture content at the time of testing. The moisture content shall be maintained until subsequent construction activities commence.

3.4 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.

3.5 PROTECTION

A. Prevent displacement or loose soil from falling into excavation; maintain soil stability.

B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

C. Protect structures, utilities and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth operations.

END OF SECTION

SECTION 31 23 17 - TRENCHING

PART 1 GENERAL

1.1 SUMMARY

A. Description: This work shall include the furnishing of all labor, materials, tools, equipment and machinery necessary for clearing and removing from the site of the work wherever located, all obstructions, trees, stumps, brush, vegetation, woods and debris; and all earth, rock and other materials to be excavated; the removal of existing structures except where specifically paid for as separate contract pay items; the replacement of topsoil after backfilling is completed; the installation and operation of all pumping, bailing and draining necessary to keep the excavation free from seepage water, water from sewer, drains, ditches, creeks and other sources, and to provide for the uninterrupted flow of sewers and surface waters during progress of the construction; the satisfactory disposal of excess and unsuitable materials not required or which cannot be used for backfilling; compacting and refilling, after settlement of all excavated areas; the restoration of all streets, alleys, rights-of-way and other lands, private or public, damaged or occupied by the Contractor in the performance of the contract to the same (or improved) condition as they were prior to the beginning of the work.

B. Section Includes:
   1. Excavating trenches for utilities.
   2. Compacted fill from top of embedment to subgrade elevations.
   3. Backfilling and compaction.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Trenching: Measurement and payment for Trenching shall be considered subsidiary to the pipe construction for which it pertains.

1.3 REFERENCES

A. American Association of State Highway and Transportation Officials:
   1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.

B. ASTM International:
   1. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).
   2. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
   3. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
   4. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
   5. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
   6. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.4 DEFINITIONS

A. Utility: Any buried pipe, duct, conduit, or cable.

1.5 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures: Requirements for submittals.

1.6 QUALIFICATIONS

A. Prepare Trench Safety Plan under direct supervision of Professional Engineer experienced in design of this Work and licensed in State of Texas, as per Section 31 23 15 – Trench Safety Systems.

1.7 FIELD MEASUREMENTS

A. Verify field measurements prior to construction.

1.8 COORDINATION

A. Verify Work associated with lower elevation utilities is complete before placing higher elevation utilities.

PART 2 PRODUCTS

2.1 MATERIALS

A. Embedment Material: The type of embedment to be used for storm sewers, sanitary sewers or water mains shall be one of the following:
   1. Coarse Aggregate Type A4 (Gravel for Trench Backfill) per Section 32 05 16 – Aggregates for Civil Site Improvements.

B. Concrete Encasement: Concrete encasement shall consist of lean concrete with a compressive strength of 2000 psi.

C. Trench Backfill:
   1. Backfill above embedment material (outside traffic areas): Excavated backfill material outside of traffic areas shall consist of an excavated material of gravel, fine rock cuttings, sandy loam, or clay having dimensions no greater than 2 inches, and compacted per applicable sections of this specification.
   2. Backfill above embedment material (beneath pavements):
      a. Coarse Aggregate Type A4 (Gravel for Trench Backfill) and compacted as specified herein.

2.2 ACCESSORIES

A. Geotextile Fabric: Non-biodegradable, woven or non-woven, from the following manufacturers:
   1. U.S. Fabrics, Inc.

2. Alkzo Nobel Geosynthetic Co.
3. Huesker, Inc.
4. TC Mirafi.
5. Tenax Corp.
6. Tensar Earth Technologies, Inc.

PART 3 EXECUTION

3.1 LINES AND GRADES

A. The Contractor shall construct the trenches to lines and grades indicated on Drawings.
   1. Engineer reserves right to make changes in lines, grades, and depths of utilities when changes are required for Project conditions.

B. The Contractor shall use laser-beam instrument with a qualified operator to establish lines and grades.

C. The Contractor shall submit to the Engineer at least 6 copies of any layout plans from the pipe manufacturer for review and approval. The Contractor shall submit the layout plans at least 30 days in advance of any actual construction of the project. The Engineer will forward all comments of the review to the Contractor for revision. Revisions shall be made and forwarded to the Engineer for his acceptance. Prior to commencement of the Project, reviewed layout plans will be sent to the Contractor marked for construction.

D. Should the Contractor's procedures not produce a finished pipe placed to grade and alignment, the pipe shall be removed and relayed and the Contractor's procedures modified to the satisfaction of the Engineer. No additional compensation shall be paid for the removal and relaying of pipe required above.

3.2 PREPARATION

A. Call Texas 811 service at 800-344-8377 not less than three working days before performing Work.
   1. Request underground utilities to be located and marked within and surrounding construction areas.

B. Identify required lines, levels, contours, and datum locations.

C. Protect plant life, lawns, rock outcropping and other features remaining as portion of final landscaping.

D. Protect bench marks, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

E. Maintain and protect above and below grade utilities indicated to remain.

F. Establish temporary traffic control and detours when trenching is performed in public right-of-way. Relocate controls and reroute traffic as required during progress of Work.

3.3 TRENCHING

A. Prepare for construction operations by the removal and disposal of all obstructions and objectionable materials from the designated construction area. Such obstructions and objectionable materials shall include the removal of designated trees, bushes, grass, miscellaneous stone, brick, concrete, scrap iron and all rubbish and debris whether above or below ground level. It is the intent of this specification to provide for the removal and disposal of all objectionable materials not specifically provided for elsewhere by the Drawings and specifications. The removal of such items shall be accomplished prior to grading and excavation operations. The removal and disposal of such items shall not be measured or paid for as a separate contract pay item. Such items shall be considered as incidental work and the cost thereof shall be included in such contract pay item as provided in the proposal and contract.

B. Maintenance of Streets During Construction:
   1. The Contractor shall at all times maintain the surfaces of streets on which he is working or has worked. The maintenance required shall include the filling of holes, blading or otherwise smoothing of the street surfaces (particularly the trench area), cleaning and removal of surplus excavation material, rubbish, etc., sprinkling of streets with water or abate dust nuisances and the elimination of interference resulting from blocking the street to residents thereon. Any or all such operations shall be performed by the Contractor upon demand by the Owner, but the Contractor shall not wait for instruction from the Owner before performing maintenance work obviously in need of being done to meet the requirements of these specifications. All costs of work covered by this paragraph shall be included in the prices bid for the various items of work; and no separate payment shall be made.
   2. In the event the Contractor fails or refuses to properly maintain the surfaces of streets on which he is working or has worked, the Owner, after due notice to the Contractor, shall perform the necessary maintenance. All costs to the Owner incurred in the performance of such work shall be deducted from any monies due or to become due to the Contractor for work performed, or the Contractor shall be billed for such costs directly as the Owner shall elect. Notice to the Contractor to be given by the Owner shall be in writing, and it shall be delivered to the Contractor or his authorized agent. Except in emergency cases, where immediate action is required, the Contractor shall have 24 hours in which to comply with the instructions of the Owner. Should the Contractor fail to do so, the Owner shall proceed with the work as set forth above.
   3. Where traffic must cross open trenches, such as street intersections and driveways, the Contractor shall provide suitable backfill bridges, protective barricades and such other safety equipment as required. The use of machinery must be so regulated as to preclude any unnecessary interference with traffic, utilities, etc. The Contractor shall abide by all applicable federal, state or local laws governing excavation work.

C. Soil Borings: Whenever the Owner has caused certain test borings to be made on the site, or when any information pertaining of the character or depth of materials is found from observations, records or otherwise, such information revealed thereby may be provided to the Contractor. The action of the Owner in revealing such information shall not, in any manner, be construed as a warranty on the part of the Owner of the exact nature of the subsurface conditions that shall be encountered during construction of the work. Although the information is shown as accurately as possible, the Owner does not guarantee that any materials to be encountered at any point or points are even approximately the same, either in

character or elevations, as those shown on the Drawings. The information thus furnished by the Owner is intended only as a guide to the Contractor in making his own investigations preliminary to submitting a bid for the work.

D. Existing Structures:

1. All existing structures, improvements and utilities shall be adequately protected, at the expense of the Contractor, from damage that might otherwise occur due to construction operations. Where construction comes in close proximity to existing structures or utilities, or if it becomes necessary to move services, poles, guy wires, pipe lines or other obstructions, the Contractor shall notify and cooperate with the utility or structure Owner. The utility lines and other existing structures shown on the Drawings are for information only and are not guaranteed by the Owner to be complete or accurate as to the location and/or depth. The Contractor shall be liable for damage to any utilities resulting from his operation. During construction, all fire hydrants, valve boxes and other existing utility controls shall be left intact, unobstructed and accessible as noted on the plan.
    a. Relocation or Replacing Utilities: Unless noted on the Drawings that utilities are to be moved by others, any cost of temporarily or permanently relocating utilities shall be borne by the Contractor. The cost of these replacements shall be included in the Contractor's bid price for the various items of work; and no separate payment shall be made. In case damage to an existing structure or utility occurs, whether such damage results directly or indirectly from the Contractor's operations, the Contractor shall be responsible to restore the structure or utility to its original condition and position without extra compensation. Temporary shut down of water and/or sewer services shall not extend overnight, holidays or weekends. The Owner shall approve all shut downs and may assist in the shut down operations.
    b. Sewer Services: All sewer services damaged during construction shall be replaced by the Contractor at his expense. Sewer service reconnections, including necessary adjustments to a sanitary sewer replacement, shall not require the services of a master plumber, if being replaced by a utility Contractor; however, in all cases, repair shall be inspected by the Owner. It shall be the responsibility of the Contractor to maintain such services throughout the construction process.
    c. Water Services: Service lines shall not be removed during excavation; and the Contractor shall provide adequate support for the services across the open ditch.
    d. Interrupted Service: Cuts or breaks in sewer mains and laterals, or service connections, shall be restored at the earliest practicable moment in order to give the least possible interruption in service. The Contractor shall be responsible for notifying customers of temporary interruption of service.
    e. Other Utilities: All water mains, water services, sanitary sewers, sanitary sewer house laterals, storm sewers, power conduits, gas mains, gas service laterals and other appurtenances damaged during construction shall be repaired or replaced. Where the exact depth of any utility or obstruction is not shown on a plan, excavation shall be made prior to reaching the obstruction in order to determine adjustments in grade if needed to prevent interference. Redesign to eliminate conflicts may be necessary. Extra compensation shall not be paid for such delays. When it is necessary to remove or adjust another utility, a representative of that utility shall be notified to decide method and work to be done. The Contractor shall make satisfactory arrangements with other utilities for the required cutting or adjustments at the Contractor's own expense. Other than for items that may be

provided in the contract for such work. No extra compensation shall be paid due to delays caused by removal of public utility structures.

f. Street Sign Posts and Signs: The Contractor shall be responsible for all damage to street sign posts and signs within the limits of his operations that remain in place or are removed and replaced. In the event that street sign posts and signs are damaged or destroyed by the Contractor's operations, they shall be replaced at the Contractors' expense.

g. Methods of Removal and Disposal: Materials or parts of structures which are to be broken up, dismantled or removed, and which are to be salvaged, shall be removed, loaded, cleaned and unloaded at sites designated by the Owner. Materials which are not designated to be salvaged shall become property of the Contractor; and he shall dispose of the material at his own cost and expense.

E. Do not advance open trench more than 200 feet ahead of installed pipe, unless preapproved by Engineer.

1. If alternate option to install HDPE by open cut is selected, Engineer will coordinate with Contractor for an appropriate approved length of open trench.

F. Trench Width

1. Trenches for pipes less than 20 inches in diameter shall have a minimum width of 10 inches and a maximum width of 1 foot on each side beyond the outside surfaces of the pipe bell or coupling.
2. Trenches for pipes between 21 and 48 inches in diameter shall have a minimum width of 12 inches and a maximum width not to exceed one pipe diameter on each side beyond the outside surfaces of the pipe.
3. Trenches for pipes 54 inches in diameter and larger shall have a minimum width of 15 inches and a maximum width of one pipe diameter beyond the outside surfaces of the pipe.
4. If trench width within the pipe zone exceeds this maximum, the entire pipe zone shall be refilled with approved backfill material, thoroughly compacted to a minimum of 95 percent of maximum density and then re-excavated to the proper grade and dimensions. Excavation along curves and bends shall be so oriented that the trench and pipe are approximately centered on the centerline of the curve, using short links for pipe and/or bend fillings if necessary.
5. For all utilities to be constructed in fill above natural ground, the embankment shall first be constructed to an elevation not less than 1 foot above the top of the utility after which excavation for the utility shall be made as indicated.

G. Alternative Trench Width for Use with Free-Flowing Granular Embedment Material

1. Based upon preapproval by Engineer, Contractor may use the alternative trench widths in conjunction with free-flowing granular embedment material. The minimum and maximum alternative trench widths are specified below; however, in most instances the minimum trench width shall be that width which is sufficient to insure working space between the outside surface of the pipe and the trench wall to safely place trench safety equipment and to properly place and compact the embedment materials.

a. Trenches for pipes less than 18 inches in diameter shall have a minimum width of 8 inches and a maximum width of 24 inches on each side beyond the outside surfaces of the pipe bell or coupling.

b. Trenches for pipes 18 inches in diameter or greater shall have a minimum width of 6 inches and a maximum width not to exceed one pipe diameter on each side beyond the outside surfaces of the pipe.

H. Trench Depth and Depth of Cover
1. All pipe and in-line appurtenances shall be laid to the grades indicated. The depth of cover shall be measured from the established finish grade, natural ground surface, subgrade for staged construction, street or other permanent surface to the top or uppermost projection of the pipe.
   a. Where not otherwise indicated, all water piping shall be laid to the following minimum depths:
      1) Water piping installed in undisturbed ground in easements of undeveloped areas which are not within existing or planned streets, roads or other traffic areas shall be laid with at least 42 inches of cover.
      2) Water piping installed in existing streets, roads or other traffic areas shall be laid with at least 42 inches of cover below finish grade.
2. Provide uniform and continuous bearing and support for bedding material and pipe.

I. Classification of Excavation: Excavation will not be considered or paid for as a separate item of work, so excavated material will not be classified as to type or measured as to quantity. Full payment for all excavation required for the construction shall be included in the various unit or lump sum contract prices for the various items of work installed, complete in place. No extra compensation, special treatment or other consideration will be allowed due to rock, pavement, caving, sheeting and bracing, falling or rising water, working under and in the proximity of trees or any other handicaps to excavation.

J. Dewatering Excavation: Underground piped utilities shall not be constructed or the pipe laid in the presence of water. All water shall be removed from the excavation prior to the pipe placing operation to insure a dry firm granular bed on which to place the underground piped utilities and shall be maintained in such unwatered condition until all concrete and mortar is set. Removal of water may be accomplished by bailing, pumping or by a well-point installation as conditions warrant.
In the event that the excavation cannot be dewatered to the point where the pipe bedding is free of mud, a seal shall be used in the bottom of the excavation. Such seal shall consist of lean concrete with a minimum depth of 3 inches.

K. Trench Conditions:
1. Before attempting to lay pipe, all water, slush, debris, loose material, etc., encountered in the trench must be pumped or bailed out and the trench must be kept clean and dry while the pipe is laid and backfilled. Where needed, sump pits shall be dug adjoining the trench and pumped as necessary to keep the excavation dewatered.
2. Backfilling shall closely follow pipe laying so that no pipe is left exposed and unattended after initial assembly. All open ends, outlets or other openings in the pipe shall be protected from damage and shall be properly plugged and blocked watertight to prevent the entrance of trench water, dirt, etc. The interior of the pipeline shall at all times be kept clean, dry and unobstructed.
3. Where the soil encountered at established footing grade is a quicksand, saturated or unstable material, the following procedure shall be used unless other methods are indicated:

a. All unstable soils shall be removed to a depth of 2 feet below bottom of piped utility. Such excavation shall be carried out to the trench widths above.
b. All unstable soil so removed shall be replaced with concrete seal foundation rock for the entire trench width or coarse aggregate materials placed in uniform layers not to exceed 6 inches, loose measure and compacted by mechanical tamping or other means which will provide a stable foundation for the utility.
c. All forms, concrete seals, sheathing and bracing, pumping, additional excavation and backfill required shall be done at the Contractor's expense.

L. Trench sidewalls shall be sloped, or sheeting and/or shoring shall be used in accordance with the Trench Safety Plan in order to provide safety and protection in, and to, the excavation.

M. Trim excavation. Remove loose matter.

N. Correct over excavated areas with compacted backfill as specified for authorized excavation or replace with lean concrete, or Flexible Base as directed by Engineer.

O. Removing Old Structures: When out of service masonry structures or foundations are encountered in the excavation, such obstructions shall be removed for the full width of the trench and to a depth of 1 foot below the bottom of the trench. When abandoned inlets or manholes are encountered and no plan provision is made for adjustment or connection to the new sewers, such manholes and inlets within the construction limits shall be removed completely to a depth of 1 foot below the bottom of the trench. In each instance, the bottom of the trench shall be restored to grade by backfilling and compacting by the methods provided above. Where the trench cuts through storm or wastewater sewers which are known to be abandoned, these sewers shall be cut flush with the sides of the trench and blocked with a concrete plug in a manner satisfactory to the Engineer. When old structures are encountered, which are not visible from the existing surface and are still in service, they shall be protected and adjusted as required to the finished grade.

P. Excess material or material which cannot be made suitable for use in embankments will be declared surplus by the Engineer and shall become the property of the Contractor to dispose of off site at a permitted fill site, without injury to the City or any individual. Such surplus material shall be removed from the work site promptly following the completion of the portion of the utility involved.

Q. Stockpile subsoil in area designated on site to only a height which yields safe slope stability and protect from erosion.

3.4 SHEETING AND SHORING

A. All excavations for trenches, structures, etc. 5 feet in depth or greater are required to have a Trench Safety Plan prepared and sealed by a Registered Professional Engineer in the State of Texas in accordance with OSHA requirements and Section 31 23 15, Trench Safety Systems of the specifications.

B. The Contractor shall submit a Trench Safety Plan to the Engineer prior to any excavation.

C. When specified in the Drawings, sheeting and shoring to be left in place as part of the completed Work, cut off minimum 18 inches below finished grade. Otherwise, sheeting and shoring shall be removed at completion of excavation work.

D. Repair damage caused by failure of the sheeting, shoring, or bracing and for settlement of filled excavations or adjacent soil.

E. Repair damage to new and existing Work from settlement, water or earth pressure or other causes resulting from inadequate sheeting, shoring, or bracing.

3.5 PIPE BEDDING AND EMBEDMENT

A. Where not otherwise provided, all piping shall be installed in a continuous envelope of embedment material meeting the requirement of materials specified herein.

B. The embedment material shall extend from 6 inches below (bedding) to 12 inches above the outer parts of the pipe (unless indicated otherwise), fittings and accessories for pipe.

C. All bracing, struts, etc., installed by the pipe manufacturer (or temporary replacements by the Contractor) shall be kept in place in the pipe, undisturbed, until the trench has been backfilled at least to the top of the pipe. When installing mortar lined and mortar coated steel pipe, all bracings, struts, etc., installed by the pipe manufacturer shall be kept in the pipe, undisturbed until the pipe has been backfilled.

3.6 BACKFILLING

A. Backfill Procedure: Backfill procedure is that procedure required to return trenched or excavated areas to a condition satisfactory to the Engineer. Such backfilling occurs in two general areas. They are 1) areas not subjected to vehicular traffic; and 2) areas subjected to, or influenced by, vehicular traffic.

The methods of backfilling to be used shall vary with the width of trench, the character of the materials excavated, the method of excavation, the type of conduit and the degree of compaction required. The placing of backfill shall not begin until the pipe structure has been properly bedded and jointed.

1. Trench backfill material is the material required to fill the trench from the top of the embedment to ground elevation or subgrade of a pavement or structure.

B. Backfill trenches to contours and elevations with unfrozen fill materials.

C. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.

D. Place geotextile fabric when specified in the Drawings.

E. Place fill material in continuous layers and compact to the density specified herein.

F. Employ placement method that does not disturb or damage utilities in trench.

G. Maintain optimum moisture content of fill materials to attain required compaction density.

H. Do not leave more than 50 feet of trench open at end of working day, unless preapproved by Engineer.

I. Protect open trench to prevent danger to the Owner, the public, and users of the Project site.

3.7 COMPACTION

A. Compaction of all bedding, embedment, and backfill materials shall be performed in a manner that shall not crack, crush and/or cause the installed pipe to be moved from the established grade and/or alignment, as shown on the Drawings. Satisfactory density shall be obtained at various depths on all backfill material as indicated from random selected test points prior to the required exfiltration or pressure tests that are to be performed on lines being constructed. The required moisture content shall be at not less than 2 percent below nor more than 4 percent above the optimum moisture of the material or as specified by the Engineer.

B. Densities for Bedding and Embedment:
   1. Coarse Aggregate Type A1 (Flexible Base) embedment shall be mechanically compacted in 6 inch lifts to a minimum of 95 percent Standard Proctor Density (ASTM D698), unless indicated otherwise on Drawings.
   2. Coarse Aggregate Type A2 (Crushed Stone) embedment shall be mechanically compacted in 6 inch lifts to a minimum of 95 percent of Maximum Dry Density in accordance with TEX-113-E, unless indicated otherwise on Drawings.
   3. Coarse Aggregate Type A4 (Gravel Trench Backfill) embedment shall be mechanically compacted in 6 inch lifts to a minimum of 95 percent Standard Proctor Density (ASTM D698), unless indicated otherwise on Drawings.

C. Backfill Densities – Areas Subjected to or Influenced by Vehicular Traffic: The trench backfill shall be mechanically compacted to the top of the subgrade in 6 inch loose lifts to at least 95 percent of maximum density as determined by ASTM D698 Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3), at, or above, optimum moisture content.

D. Backfill Densities – Areas Not Subjected to or Influenced by Vehicular Traffic: The trench backfill shall be placed in layers not more than 10 inches loose depth and shall be compacted by mechanical means. Compaction methods to at least 95 percent of maximum density as determined by ASTM D698 Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3), at, or above, optimum moisture content.

E. When tests indicate Work does not meet specified requirements, remove Work, replace, compact, and retest.

3.8 TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Top Surface of Backfilling Under Paved Areas: Plus or minus 1 inch (0.08 feet) from required elevations.

C. Top Surface of General Backfilling: Plus or minus 1 inch (0.08 feet) from required elevations.

3.9 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.

3.10 PROTECTION OF FINISHED WORK

A. Section 01 70 00 - Execution and Closeout Requirements: Protecting finished work.

B. Reshape and re-compact fills subjected to vehicular traffic during construction.

END OF SECTION

SECTION 31 23 24 - FLOWABLE FILL

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Flowable fill for:
      a. Structure backfill.
      b. Utility bedding.
      c. Utility backfill.
      d. Filling abandoned utilities.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT – Not Used

1.3 REFERENCES

A. ASTM International:
   1. ASTM C33 - Standard Specification for Concrete Aggregates.
   2. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
   3. ASTM C150 - Standard Specification for Portland Cement.
   4. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
   5. ASTM C403/C403M - Standard Test Method for Time of Setting of Concrete Mixtures by Penetration Resistance.
   6. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete.
   7. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
   8. ASTM C1017/C1017M - Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
   9. ASTM C1040 - Standard Test Methods for Density of Unhardened and Hardened Concrete In Place By Nuclear Methods.
   10. ASTM D4832 - Standard Test Method for Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders.

1.4 DEFINITIONS

A. Utility: Any buried pipe, duct, conduit, manhole, tank or cable.

B. Excavatable Flowable Fill: Lean cement concrete fill used where future excavation may be required such as fill for utility trenches, bridge abutments, and culverts.

C. Non-Excavatable Flowable Fill: Lean cement concrete fill used where future excavation is not anticipated such as fill below structure foundations and filling abandoned utilities.

1.5 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures: Requirements for submittals.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
   1. Product source approved by Engineer.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site.

B. Do not install flowable fill during inclement weather or when ambient temperature is less than 40 degrees F.

1.8 FIELD MEASUREMENTS

A. Verify field measurements before installing flowable fill to establish quantities required to complete the Work.

PART 2 PRODUCTS

2.1 FLOWABLE FILL

A. Flowable Fill: Excavatable type and non-excavatable type.

2.2 MATERIALS

A. Portland Cement: ASTM C150 Type I - Normal; Type IA - Air Entraining; Type II - Moderate; Type IIA - Air Entraining; Type III - High Early Strength; Type IIIA - Air Entraining.

B. Fine Aggregates: ASTM C33.

C. Water: Clean and not detrimental to concrete.

2.3 ADMIXTURES

A. Air Entrainment: ASTM C260.

B. Chemical Admixture: ASTM C494/C494M.
   1. Type A - Water Reducing.
   2. Type B - Retarding.
   3. Type C - Accelerating.
   4. Type D - Water Reducing and Retarding.
   5. Type E - Water Reducing and Accelerating.
   6. Type F - Water Reducing, High Range.
   7. Type G - Water Reducing, High Range and Retarding.

C. Fly Ash: ASTM C618 Class C or F obtained from residue of electric generating plant using ground or powdered coal.

D. Plasticizing: ASTM C1017/C1017M Type I, plasticizing. Type II, plasticizing and retarding.

2.4 MIXES

A. Mix and deliver flowable fill in accordance with ASTM C94/C94M, Option C.

Flowable Fill Design Mix: ITEM	EXCAVATABLE	NON-EXCAVATABLE
Cement Content	75-100 lbs/cy	100-150 lbs/cy
Fly Ash Content	None	150-600 lbs/cy
Water Content	Per mix design	Per mix design
Air Entrainment	5-35 percent	5-15 percent
28 Day Compressive Strength	Maximum 150 psi.	Minimum 250 psi
Unit Mass (Wet)	80-110 pcf	100-125 pcf
Temperature, Minimum at point of delivery	50 degrees F	50 degrees F

B. Provide water content in design mix to produce self-leveling, flowable fill material at time of placement.

C. Design mix air entrainment and unit mass are for laboratory design mix and source quality control only.

2.5 SOURCE QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Testing, inspection and analysis requirements.

B. Test and analyze properties of flowable fill design mix and certify results for the following:
   1. Design mix proportions by weight of each material.
   2. Fine Aggregate: ASTM C33 for material properties and gradation.
   3. Properties of plastic flowable fill design mix including:
      a. Temperature.
      b. Slump.
      c. Air entrainment.
      d. Wet unit mass.
      e. Yield.
      f. Cement factor.
   4. Properties of hardened flowable fill design mix including:
      a. Compressive strength at 1 day, 7 days, and 28 days. Report compressive strength of each specimen and average specimen compressive strength.
      b. Unit mass for each specimen and average specimen unit mass at time of compressive strength testing.

C. Prepare delivery tickets containing the following information:
   1. Project Designation.
   2. Date.
   3. Time.
   4. Class and Quantity of flowable fill.
   5. Actual batch proportions.
   6. Free moisture content of aggregate.
   7. Quantity of water withheld.

PART 3 EXECUTION

3.1 EXAMINATION

A. Delivery Tickets:
   1. Submit duplicate delivery tickets indicating actual materials delivered to Project site.

B. Verify excavation and trenching is complete.

C. Verify utility installation is complete and tested before placing flowable fill.

D. Verify excavation is dry and dewatering system is operating.

3.2 PREPARATION

A. Support and restrain utilities to prevent movement and flotation during installation of flowable fill.

B. Protect structures and utilities from damage caused by hydraulic pressure of flowable fill before fill hardens.

C. Protect utilities and foundation drains to prevent intrusion of flowable fill.

3.3 INSTALLATION - FILL, BEDDING, AND BACKFILL

A. Place flowable fill by chute, pumping or other methods approved by Engineer.
   1. When required, place flowable fill under water using tremie procedure.
   2. Do not place flowable fill through flowing water.

B. Place flowable fill in lifts to prevent lateral pressures from exceeding structural capacity of structures and utilities.

C. Place flowable fill evenly on both sides of utilities to maintain alignment.

D. Place flowable fill to elevations indicated on Drawings without vibration or other means of compaction.

E. Defective Flowable Fill: Fill failing to meet the following test requirements or fill delivered without the following documentation.

1. Test Requirements:
    a. Minimum temperature at point of delivery.
    b. Compressive strength requirements for each type of fill.
2. Documentation: Duplicate delivery tickets.

3.4 INSTALLATION - FILLING ABANDONED UTILITIES

A. Verify pipes and conduits are not clogged and are sufficiently empty to permit gravity installation of flowable fill for entire length indicated to be filled.

B. Seal lower end of pipes and conduits by method to contain flowable fill and to vent trapped air caused by filling operations.

C. Place flowable fill using method to ensure there are no voids.
1. Fill pipes and conduits from high end.
2. Fill manholes, tanks, and other structures from grade level access points.

D. After filling pipes and conduits seal both ends.

E. Defective Flowable Fill: Fill failing to meet the following test requirements or fill delivered without the following documentation.
1. Test Requirements:
    a. Minimum temperature at point of delivery.
    b. Compressive strength requirements for each type of fill.
2. Documentation: Duplicate delivery tickets.

3.5 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.

3.6 CLEANING

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for cleaning.

B. Remove spilled and excess flowable fill from Project site.

C. Restore facilities and site areas damaged or contaminated by flowable fill installation to existing condition before installation.

END OF SECTION

SECTION 31 25 12 – STORM WATER POLLUTION PREVENTION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Documentation to be prepared and signed by Contractor before conducting construction operations, in accordance with the Texas Pollutant Discharge Elimination System (TPDES) Construction General Permit Number TXR 150000, latest issue date (the Construction General Permit).
   2. Implementation, maintenance inspection, and termination 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 appropriate practices.
   3. Review of the Storm Water Pollution Prevention Plan (SWP3) implementation in a meeting with Engineer prior to start of construction.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Storm Water Pollution Prevention Plan:
   1. Basis of Measurement: Lump Sum.
   2. Basis of Payment: Payment for Storm Water Pollution Prevention Plan shall be made at the lump sum bid for Storm Water Pollution Prevention Plan. Payment for all work prescribed under this item shall be full compensation for the Storm Water Pollution Prevention Plan including all preparation, submittals, notices, updates, and revisions.

B. Storm Water Pollution Prevention Plan Implementation:
   1. Basis of Measurement: Lump Sum.
   2. Basis of Payment: Includes all aspects of implementing the SWP3, from Notice of Intent through Notice of Termination.

1.3 REFERENCES

A. Construction General Permit (TPDES No. TXR 150000).

B. Clean Water Act.

1.4 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures: Requirements for submittals.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with the SWP3 as per the submission of the Notice of Intent.

B. Maintain one copy of the SWP3 document on site.

1.7 PRE-INSTALLATION MEETINGS – Not Used

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 SITE SPECIFIC STORM WATER POLLUTION PREVENTION PLAN (SWP3)

A. Fulfill all TPDES Construction General Permit (TXR 150000) requirements.

B. Contractor shall fulfill the role of Primary Operator as defined by the TPDES Construction General Permit (TXR 150000) for this project.

C. Prepare and submit all required documentation and pay all applicable fees to TCEQ required by the TPDES Construction General Permit (TXR 150000). This includes but is not limited to:
   1. Notice of Intent.
   2. Site Notices.
   3. Notice of Termination.
   4. Notification of MS4 Operator.

D. SWP3:
   1. Prepare a SWP3 following Part III of the TPDES Construction General Permit (TXR 150000).
   2. Update or revise the SWP3 as needed during the construction following Part III, Section E of the TPDES Construction General Permit (TXR 150000).
   3. Submit the SWP3 and any updates or revisions to the Engineer for review and address comments prior to commencing, or continuing, construction activities.
   4. Conduct inspections in accordance with TPDES Construction General Permit (TXR 150000).
   5. Maintain copies of SWP3, inspection reports, and other documentation as required by TPDES Construction General Permit (TXR 150000).

3.2 SWP3 IMPLEMENTATION

A. Implement SWP3 utilizing state of the art Best Management Practice controls as required by the Construction General Permit, the site specific SWP3, and local government.

B. Inspect and maintain controls throughout the course of construction per the Construction General Permit requirements.

C. Remove controls per the Construction General Permit requirements.

D. On-Site Waste Material Storage:
   1. On-site waste material storage shall be self-contained and shall satisfy appropriate locate, state, and federal rules and regulations.
   2. Prepare list of waste material to be stored on-site. Update list as necessary to include up-to-date information. Keep a copy of updated list with the SWP3.
   3. Prepare description of controls to reduce pollutants generated from on-site storage. Include storage practices necessary to minimize exposure of materials to storm water, and spill prevention and response measures consistent with best management practices. Keep a copy of the description with the SWP3.

END OF SECTION

SECTION 32 05 16 - AGGREGATES FOR CIVIL SITE IMPROVEMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Coarse aggregate materials.
2. Fine aggregate materials.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Aggregate:
1. Basis of Measurement and Payment: Fine aggregate and course aggregate will not be paid for as a separate bid item, but shall be considered incidental to the item for which they pertain.

1.3 REFERENCES

A. American Association of State Highway and Transportation Officials:
1. AASHTO M147 - Standard Specification for Materials for Aggregate and Soil-Aggregate Subbase, Base and Surface Courses.
2. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.

B. ASTM International:
1. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
2. ASTM D448 - Standard Classification for Sizes of Aggregate for Road and Bridge Construction
3. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).
4. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
5. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).
6. ASTM D4318 - Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

1.4 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures: Requirements for submittals.

1.5 QUALITY ASSURANCE

A. Furnish each aggregate material from single source throughout the Work.

B. Perform Work in accordance with Texas Department of Transportation's Standard Specifications for Construction of Highways, Streets, and Bridges (latest Edition).

C. Maintain one copy of Texas Department of Transportation's Standard Specifications for Construction of Highways, Streets, and Bridges (latest Edition) document on site.

PART 2 PRODUCTS

2.1 COARSE AGGREGATE MATERIALS

A. Coarse Aggregate Type A1 (Flexible Base): Conforming to TxDOT's Standard Specifications Item 247, Grade 1 or 2, Type A.

B. Coarse Aggregate Type A2 (Crushed Stone): washed; free of shale, clay, friable material and debris; graded in accordance with ASTM C136; within the following limits, based on ASTM D448:

Coarse Aggregate Type A2 Grading
Grade No. 2

Sieve Size	Percent Passing
2 inches	100%
1-1/2 inches	95-100%
3/4 inch	40-70%
3/8 inches	10-30%
No. 4	0-5%

OR

Coarse Aggregate Type A2 Grading
Grade No. 3

Sieve Size	Percent Passing
1-1/2 inches	95-100%
3/4 inch	60-90%
1/2 inch	25-60%
No. 4	0-5%

C. Coarse Aggregate Type A3 (Gravel Base Course): Durable particles of gravel mixed with approved binding material; and shall be free from thin or elongated pieces, clay lumps, soil loam or vegetable matter. The material may be bank-run; or the binder may be added and incorporated by methods approved by Engineer. Should the material be secured from pits, the overburden or stripping from the site of the pits shall be removed to such a distance that none shall fall or wash into the pit; and it shall be placed so as to divert surface drainage away from the pit site. The pit shall be well drained at all times. The pits shall be opened in such a manner as to expose the vertical faces of all strata of acceptable materials; and, unless otherwise directed by Owner, the materials shall be secured in successive vertical cuts extending through all the exposed strata, in order that a uniformity mixed material shall be secured.

1. Tests: The soil binder shall meet the following requirements:
   a. The liquid limit shall not exceed 35 when tested in accordance with ASTM D423.
   b. The plastic limit shall be determined by testing in accordance with ASTM D424.
   c. The plasticity index shall not exceed 12 nor be less than 4 when calculated in accordance with ASTM D424.
   d. The preparation of samples for testing according to ASTM D423 and D424 shall be in accordance with the requirements of ASTM D2217.
   e. The linear shrinkage shall not exceed 6 percent.
2. Gradation: The material when tested by standard laboratory methods shall meet the following percentages by weight:

Passing 1 ¾ in. sieve (45.0 mm)	100%
Passing ¾ in. sieve (9.5 mm)	40 to 80%
Passing No. 4 sieve (4.75 mm)	25 to 60%
Passing No. 40 sieve (425 µm)	15 to 35%

   a. Material passing the No. 40 sieve (425 µm) shall be known as soil binder.
   b. Materials containing conglomerate or gravel larger than 2 (50 mm) in any dimension shall be broken up and uniformly mixed with the remainder of the materials. Upgrading by the addition of washed gravel in order to meet the requirements of this section shall be permitted.
   c. If additional binder and/or soil binder are considered necessary by the Owner after gravel materials are spread and shaped, same shall be furnished and applied in the amount directed by the Owner; such additional binder and/or soil binder shall be carefully and evenly

incorporated with the pit materials in place by scarifying, harrowing or other methods approved by the Owner.

3. Rejection: Gravel which fails to meet the requirements of these specifications may be rejected by the Engineer. Such rejection shall incur no cost to the Owner.

D. Coarse Aggregate Type A4 (Gravel for Trench Backfill): Sandy gravel material, free of clay, shale, organic matter; meeting the following requirements:

1. Tests:
   a. The liquid limit shall not exceed 35 when tested in accordance with ASTM Designation D423.
   b. The plasticity index shall not exceed 12 nor be less than 4 when calculated in accordance with ASTM Designation D424.
   c. The linear shrinkage shall not exceed six percent.
2. Gradation: The material when tested by standard laboratory methods shall meet the following percentages by weight:

Passing 2 in. sieve	100%
Passing 1/2 inch sieve	50 to 85%
Passing No. 4 sieve	20 to 65%
Passing No. 100 sieve	0 to 5%

2.2 FINE AGGREGATE MATERIALS

A. Fine Aggregate Type A5 (Sand): Conforming to TxDOT's Standard Specifications Item 421.2(5), Fine Aggregate.

2.3 SOURCE QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Testing and inspection services.

B. Coarse Aggregate Material - Testing and Analysis: Perform in accordance with ASTM D698.

C. Fine Aggregate Material - Testing and Analysis: Perform in accordance with ASTM D698.

D. When tests indicate materials do not meet specified requirements, change material and retest.

PART 3 EXECUTION

3.1 STOCKPILING

A. Stockpile materials on site at locations designated by Engineer.

B. Stockpile in sufficient quantities to meet Project schedule and requirements.

C. Separate different aggregate materials with dividers or stockpile individually to prevent mixing.

D. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.

3.2 STOCKPILE CLEANUP

A. Remove stockpile, leave area in clean and neat condition. Grade site surface to prevent free standing surface water.

END OF SECTION

SECTION 32 11 23 - FLEXIBLE BASE

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Crushed stone foundation course for structural backfill, embedment, trench backfill, surfacing, pavement or other base courses, furnished and installed on a prepared surface. The Flexible Base shall be constructed as herein specified in one or more courses in conformity with the typical sections and to the lines and grades as indicated or as established by the Engineer.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT - Not Used

1.3 REFERENCES

A. Texas Department of Transportation's Standard Laboratory Test Procedures:

1.	Moisture Content	Tex-103-E
2.	Liquid Limit	Tex-104-E
3.	Plasticity Index	Tex-106-E
4.	Bar Linear Shrinkage	Tex-107-E, Part II
5.	Sieve Analysis	Tex-110-E
6.	Moisture-Density Determination	Tex-113-E
7.	Roadway Density	Tex-115-E
8.	Wet Ball Mill	Tex-116-E
9.	Triaxial Tests (Part I or II as selected by the Engineer)	Tex-117-E
10.	Particle Count	Tex-460-A, Part I

B. American Association of State Highway and Transportation Officials:

1. AASHTO M288 - Standard Specification for Geotextile Specification for Highway Applications.

1.4 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures: Requirements for submittals.

1.5 QUALITY ASSURANCE

A. Furnish each aggregate material from single source throughout the Work.

B. Perform Work in accordance with Texas Department of Transportation's Standard Specifications for Construction of Highways, Streets, and Bridges (latest Edition).

C. Maintain one copy of Texas Department of Transportation's Standard Specifications for Construction of Highways, Streets, and Bridges (latest Edition) on site.

PART 2 PRODUCTS

2.1 FLEXIBLE BASE MATERIAL REQUIREMENTS

A. Flexible Base: Texas Department of Transportation's Standard Specification Item 247, Grade 1 or 2, Type A.

2.2 ACCESSORIES

A. Geotextile Fabric: As specified in the Drawings.

B. Herbicide: As specified in the Drawings.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify compacted substrate is dry and ready to support paving and imposed loads.
   1. Remove soft substrate and replace with compacted fill.
   2. No additional compensation will be made for materials, equipment or labor required for Proof Rolling, but shall be considered subsidiary to Flexible Base.

B. Verify substrate has been inspected, gradients and elevations are correct.

3.2 PREPARATION

A. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.

B. Do not place fill on soft, muddy, or frozen surfaces.

3.3 BASE PLACEMENT

A. When specified in the Drawings, install geotextile fabric over subgrade in accordance with manufacturer's instructions.
   1. Lap ends and edges minimum 6 inches.
   2. Anchor fabric to subgrade when required to prevent displacement until aggregate is installed.

B. When the Flexible Base compacted thickness is less than (or equal to) 6 inches, spread base material over prepared substrate to total compacted thickness indicated on Drawings.

C. When the Flexible Base compacted thickness exceeds 6 inches, place base material equal thickness layers to total compacted thickness indicated on Drawings.
   1. Maximum Layer Compacted Thickness: 6 inches.
   2. Minimum Layer Compacted Thickness: 3 inches.

D. Level and contour surfaces to elevations, profiles, and gradients indicated.

E. Maintain optimum moisture content of base materials to attain specified compaction density.

F. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

G. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

3.4 TOLERANCES

A. Section 01 40 00 - Quality Requirements and Texas Department of Transportation Item 247.3(1)(f), Tolerances.

B. Maximum Variation from Thickness: 1/2 inch.

C. Maximum Variation from Elevation: 1/2 inch.

3.5 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.

END OF SECTION

SECTION 32 31 13 - CHAIN LINK FENCES AND GATES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Fence framework, fabric, and accessories.
2. Excavation for post bases.
3. Concrete foundation for posts and center drop for gates.
4. Manual gates and related hardware.
5. Privacy slats.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Fencing:
1. Basis of Measurement: By linear foot to fence height specified, based on specified post spacing.
2. Basis of Payment: Includes posts, excavation, concrete, rails, tension wire, fabric, accessories, attachments.

B. Gates: Not Used

1.3 REFERENCES – Not Used

1.4 SYSTEM DESCRIPTION

A. Fence Height: as indicated on Drawings.

B. Line Post Spacing: At intervals not exceeding 10 feet.

C. Fence Post and Rail Strength: Conform to ASTM F1043, Heavy Industrial Fence, quality.

1.5 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures: Requirements for submittals.

1.6 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.

B. Project Record Documents: Accurately record actual locations of property perimeter posts relative to property lines and easements.

C. Operation and Maintenance Data: Procedures for submittals.

1.7 QUALITY ASSURANCE – Not Used

1.8 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.

1.9 DELIVERY, STORAGE AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Deliver fence fabric and accessories in packed cartons or firmly tied rolls.

C. Identify each package with manufacturer's name.

D. Store fence fabric and accessories in secure and dry place.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers:
1. Anchor Fence Inc.
2. Cyclone Inc.
3. Page Aluminized Steel Corp.
4. Substitutions: Section 01 60 00 - Product Requirements - Not Permitted.

2.2 MATERIALS AND COMPONENTS

A. Materials and Components: Conform to Texas Department of Transportation's Standard Specifications for Construction of Highways, Streets, and Bridges (latest Edition), Item 550 – Chain Link Fencing.

B. Concrete: Type(s) specified in Project Notes.

PART 3 EXECUTION

3.1 INSTALLATION

A. Installation shall be in accordance with Texas Department of Transportation's Standard Specifications for Construction of Highways, Streets, and Bridges (latest Edition), Item 550 – Chain Link Fencing

3.2 ERECTION TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Maximum Variation From Plumb: 1/4 inch.

C. Maximum Offset From Indicated Position: 1 inch.

D. Minimum distance from property line: 6 inches.

END OF SECTION

SECTION 32 92 19 - SEEDING

PART 1 GENERAL

1.1 SUMMARY

A. Description: This item shall consist of preparing a seed bed to the lines and grades indicated, sowing of seed, fertilizing, mulching with straw, asphalt, cellulose fiber and other management practices along and across such areas as are indicated or as directed by the Engineer.

B. Section Includes:
   1. Fertilizing.
   2. Seeding.
   3. Hydroseeding.
   4. Mulching.
   5. Maintenance.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Seeding:
   1. Measurement: Work and acceptable material for Broadcast Seeding or Hydraulic Seeding will be measured by the linear foot, complete in place, with a minimum of 95 percent coverage with no bare areas exceeding 16 square feet and a 1 1/2 inch stand of grass. Bare areas shall be reprepared and reseeded as required.
   2. Payment: The work performed and materials furnished and measured will be paid for at the unit price bid for Broadcast Seeding or Hydraulic Seeding of the method specified, which price shall be full compensation for furnishing all materials, including all topsoil (if not included as a separate pay item), water seed, fertilizer, or mulch and for performing all operations necessary to complete the work. Payment will be made under one of the following:
      a. Broadcast Seeding – per Linear Foot

1.3 REFERENCES

A. ASTM International:
   1. ASTM C602 - Standard Specification for Agricultural Liming Materials.

1.4 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, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, Brome Grass, or vegetative species other than specified species to be established in given area.

1.5 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures: Requirements for submittals.

1.6 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Operation and Maintenance Data: Include maintenance instructions, cutting method and maximum grass height; and types, application frequency, and recommended coverage of fertilizer.

1.7 QUALITY ASSURANCE

A. Provide seed mixture in containers showing percentage of seed mix, germination percentage, inert matter percentage, weed percentage, year of production, net weight, date of packaging, and location of packaging.

1.8 QUALIFICATIONS

A. Seed Supplier: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.

B. Installer: Company specializing in performing work of this section with minimum three years documented experience.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.

B. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable.

C. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

1.10 MAINTENANCE SERVICE

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for maintenance service.

B. Maintain seeded areas immediately after placement until grass is well established and exhibits vigorous growing condition.

PART 2 PRODUCTS

2.1 SEED

A. All seed must meet the requirements of the Texas Seed Law including the labeling requirements for showing pure live seed (PLS), name and type of seed. Seed furnished shall be of the previous season’s crop and the date of analysis shown on each bag shall be within nine months of the time of delivery to the project. Each variety of seed shall be furnished and delivered in separate bags or containers. A sample of each variety of seed shall be furnished

for analysis and testing when directed by the Engineer. The amount of seed planted per acre shall be of the type specified below.

B. Substitutions: Section 01 60 00 - Product Requirements.

2.2 ACCESSORIES

A. Mulching Material: Oat or wheat straw, free from weeds, foreign matter detrimental to plant life, and dry. Hay or chopped cornstalks are not acceptable. Straw mulch shall be spread uniformly over the area indicated or as designated by the Engineer at the rate of 2 to 2 1/2 tons of straw per acre. The actual rate of application will be designated by the Engineer. Straw may be hand or machine placed and adequately secured.

B. Cellulose Fiber Mulch: Cellulose fiber mulch shall be spread uniformly over the area indicated or as designated by the Engineer at the rate of 45 to 80 lbs per 1000 square feet.

C. Fertilizer: All fertilizer shall be delivered in bags or containers clearly labeled showing the analysis. The fertilizer is subject to testing by the State Chemist in accordance with the Texas Fertilizer Law. A pelleted or granulated fertilizer shall be used with an analysis indicated below. The figures in the analysis represent the percent of nitrogen, phosphoric acid and potash nutrients, respectively, as determined by the methods of the Association of Official Agricultural Chemists. Fifty percent or greater of the Nitrogen required shall be in the form of Nitrate Nitrogen (NO_3). The remaining Nitrogen required may be in the form of Urea Nitrogen ($CO(NH_2)_2$).

In the event it is necessary to substitute a fertilizer of a different analysis, it shall be a pelleted or granulated fertilizer with a lower concentration. The total amount of nutrients furnished and applied per acre shall equal or exceed that specified for each nutrient.

Fertilizer shall be commercial grade; recommended for grass; of proportion necessary to eliminate deficiencies of topsoil to the following proportions: Nitrogen 15 percent, phosphoric acid 15 percent, soluble potash 15 percent.

D. Lime: ASTM C602, Class T agricultural limestone containing a minimum 80 percent calcium carbonate equivalent.

E. Water: Clean, fresh and free of industrial wastes and other substances or matter capable of inhibiting vigorous growth of grass.

F. Soil Retention Blanket: Jute mesh or matting (open weave), or other material used as a soil retention blanket for erosion control purposes.

G. Herbicide: As specified.

H. Stakes: Softwood lumber, chisel pointed.

I. String: Inorganic fiber.

2.3 SOURCE QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Testing, inspection and analysis requirements.

B. Analyze to ascertain percentage of nitrogen, phosphorus, potash, soluble salt content, organic matter content, and pH value.

C. Provide recommendation for fertilizer and lime application rates for specified seed mix as result of testing.

D. Testing is not required when recent tests and certificates are available for imported topsoil. Submit these test results to testing laboratory. Indicate, by test results, information necessary to determine suitability.

PART 3 EXECUTION

3.1 EXAMINATION – Not Used

3.2 PREPARING SEED BED

A. After the designated areas have been rough graded to the lines, grades and typical sections indicated or as provided for in other items of this contract and any other soil area disturbed by the construction, a suitable seed bed shall be prepared. The seed bed shall consist of either 4 inches of approved topsoil or 4 inches of approved salvaged topsoil cultivated and rolled sufficiently to a state of good tilth which could prevent the seed from being covered too deep for optimum germination. The optimum depth for seeding shall be 1/4 inch. Water shall be applied as required to prepare the seed bed. Seeding shall be performed in accordance with the requirements hereinafter described.

3.3 FERTILIZING

A. Apply lime at application rate recommended by soil analysis. Work lime into top 6 inches of soil.

B. Apply fertilizer at application rate as indicated below:

Use	Type	Application Rate Pound Per Acre
Broadcast Seeding	Any	400
Hydraulic Seeding	Water Soluble	653
Sodding	Any	300

C. Apply after smooth raking of topsoil and prior to roller compaction.

D. Do not apply fertilizer at same time or with same machine used to apply seed.

E. Mix fertilizer thoroughly into upper 2 inches of topsoil.

F. Lightly water soil to aid dissipation of fertilizer. Irrigate top level of soil uniformly.

3.4 BROADCAST SEEDING

A. The seed or seed mixture in the quantity specified shall be uniformly distributed over the prepared seed bed areas indicated or where directed. If the sowing of seed is by hand, rather than by mechanical methods, the seed shall be sown in two directions at right angles to each other. If mechanical equipment is used, all varieties of seed, as well as fertilizer, may be distributed at the same time, provided that each component is uniformly applied at the specified rate. After planting, the planted area shall be rolled with a corrugated roller of the Culitpacker type. All rolling of the slope areas shall be on the contour.

B. Seed Mixture and Rate of Application for Broadcast Seeding: From September 15 to March 1, seeding shall be with a combination of unhulled Bermuda Grass at a rate of 2 pounds per 1000 square feet and winter rye at a rate of 7 pounds per 1000 square feet that has a PLS = 0.83. From March 1 to September 15, seeding shall be with hulled Bermuda Grass at a rate of 2 pounds per 1000 square feet with a PLS = 0.83. Fertilizer shall be applied as specified herein.

C. Do not seed areas in excess of that which can be mulched on same day.

D. Do not sow immediately following rain, when ground is too dry, or when winds are over 12 mph.

E. Lightly roll seeded area with roller not exceeding 112 lbs/linear foot.

F. Immediately following seeding and rolling, apply mulch to thickness of 1/8 inch. Maintain clear of shrubs and trees.

G. The broadcast seeded areas shall immediately be watered with a minimum of 5 gallons of water per square yard or as needed and in the manner and quantity as directed by the Engineer. Water shall be applied at a minimum rate of 10 gallons per square yard weekly except when rainfall of 1/2 inch or greater occurs on the site, the water can be postponed for one week or as directed, until the grass is uniformly 1 1/2 inches in height.

3.5 HYDRAULIC SEEDING – Not Used

3.6 SEED PROTECTION

A. Cover seeded slopes where grade is 3:1 (Horizontal:Vertical) or greater with soil retention blanket. 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. Overlap edges and ends of adjacent rolls minimum 12 inches. 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.

3.7 MAINTENANCE

A. Mow grass at regular intervals to maintain at maximum height of 2-1/2 inches. Do not cut more than 1/3 of grass blade at each mowing. Perform first mowing when seedlings are 40 percent higher than desired height.

B. Neatly trim edges and hand clip where necessary.

C. Immediately remove clippings after mowing and trimming. Do not let clippings lay in clumps.

D. Water to prevent grass and soil from drying out.

E. Lightly roll surface to remove minor depressions or irregularities.

F. Control growth of weeds. Apply herbicides. Remedy damage resulting from improper use of herbicides.

G. Immediately reseed areas showing bare spots.

H. Repair washouts or gullies.

I. Protect seeded areas with warning signs during maintenance period.

END OF SECTION

SECTION 32 92 23 - SODDING

PART 1 GENERAL

1.1 SUMMARY

A. Description: This item shall consist of providing fertilizer and planting Bermuda Grass or other acceptable sod indicated, along or across such areas as are indicated and in accordance with specification requirements outlined herein.

B. Section Includes:
   1. Preparation of subsoil.
   2. Placing topsoil.
   3. Fertilizing.
   4. Sod installation.
   5. Maintenance.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Sodded Areas:
   1. Measurement: Work and acceptable material for Sodding will be measured by the square yard complete in place with a minimum of 95 percent growth with a 2 1/2 inch stand of grass.
   2. Payment: The work performed and materials furnished and measured as provided under Measurement will be paid for at the unit price bid for Bermuda Block Sodding or St. Augustine Block Sodding as the case may be, which prices shall each be full compensation for completing the work including all water, rolling, pegging and fertilizer as indicated.
      Payment will be made under one of the following:
      a. Bermuda Block Sodding – Per Square Yard.
      b. St. Augustine Block Sodding – Per Square Yard.

1.3 REFERENCES

A. ASTM International:
   1. ASTM C602 - Standard Specification for Agricultural Liming Materials.

B. Turfgrass Producers International:
   1. TPI - Guideline Specifications to Turfgrass Sodding.

1.4 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, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, Brome Grass or vegetative species other than specified species to be established in given area.

1.5 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures: Requirements for submittals.

1.6 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Operation and Maintenance Data: Submit maintenance instructions, cutting method and maximum grass height; and types, application frequency, and recommended coverage of fertilizer.

1.7 QUALITY ASSURANCE

A. Sod: Root development capable of supporting its own weight without tearing, when suspended vertically by holding upper two corners.

1.8 QUALIFICATIONS

A. Sod Producer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.

B. Installer: Company specializing in performing work of this section with minimum three years documented experience approved by sod producer.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.

B. Deliver sod on pallets or in rolls as specified. Protect exposed roots from dehydration.

C. Do not deliver more sod than can be laid within 24 hours.

1.10 COORDINATION – Not Used

1.11 MAINTENANCE SERVICE

A. Section 01 70 00 - Execution and Closeout Requirements: Maintenance service.

B. Maintain sodded areas immediately after placement until grass is well established and exhibits vigorous growing condition.

PART 2 PRODUCTS

2.1 SOD

A. Sod: The sod shall consist of live, growing Bermuda Grass or other acceptable sod indicated secured from sources where the soil is fertile. St. Augustine and Bermuda sod shall have a healthy, virile root system of dense, thickly matted roots throughout the soil of the sod for minimum thickness of 1 inch. The thickness measure does not include grass. The sod shall be

cut in rectangular pieces with its shortest side not less than 12 inches. The Contractor shall not use sod from areas where the grass is thinned out nor where the grass roots have been dried out by exposure to the air and sun to such an extent as to damage its ability to grow when transplanted. The sod shall be free from noxious weeds or other grasses and shall not contain any matter deleterious to its growth or which might affect its subsistence or hardiness when transplanted. Unless the area has been closely pastured, it shall be closely mowed and raked to remove all weeds and long standing stems. Sources from which sod is to be secured shall be approved by the Engineer.

Care shall be taken at all times to retain the native soil of the roots of the sod during the process of excavating, hauling and planting. Sod material shall be kept moist from the time it is dug until planted. When so directed by the Engineer, the sod existing at the source shall be watered to the extent required prior to excavating.

2.2 SOIL MATERIALS

A. Topsoil: As specified in Section 31 05 13.

2.3 ACCESSORIES

A. Fertilizer: Commercial grade; recommended for grass, with fifty percent of elements derived from organic sources; of proportion necessary to eliminate deficiencies of topsoil to the following proportions: nitrogen 15 percent, phosphoric acid 15 percent, soluble potash 15 percent.

B. Lime: ASTM C602, Class T agricultural limestone containing a minimum 80 percent calcium carbonate equivalent.

C. Water: Clean, fresh and free of industrial wastes and other substances or matter capable of inhibiting vigorous growth of grass.

D. Wood Pegs: Softwood, sufficient size and length to anchor sod on slope.

E. Herbicide: As specified.

2.4 SOURCE QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Testing, inspection and analysis requirements.

B. Analyze to ascertain percentage of nitrogen, phosphorus, potash, soluble salt content, organic matter content, and pH value.

C. Provide recommendation for fertilizer and lime application rates for specified sod grass species as result of testing.

D. Testing is not required when recent tests are available for imported topsoil. Submit these test results to testing laboratory. Indicate, by test results, information necessary to determine suitability.

PART 3 EXECUTION

3.1 EXAMINATION – Not Used

3.2 PREPARATION OF SUBSOIL

A. Prepare sub-soil and eliminate uneven areas and low spots.

B. Maintain lines, levels, profiles and contours. Make changes in grade gradual. Blend slopes into level areas.

C. Remove foreign materials and undesirable plants and their roots. Do not bury foreign material beneath areas to be sodded.

D. Remove contaminated subsoil.

E. Scarify sub-soil to depth of 4 inches where topsoil is to be placed.

F. Repeat cultivation in areas where equipment, used for hauling and spreading topsoil, has compacted subsoil.

3.3 PLACING TOPSOIL

A. Spread topsoil to minimum depth of 4 inches over area to be sodded.

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 edging at periphery of sodded areas in straight lines to consistent depth.

3.4 FERTILIZING

A. Apply lime at application rate recommended by soil analysis. Work lime into top 6 inches of soil.

B. Apply fertilizer at application rate of 300 pounds per acre.

C. Apply fertilizer after smooth raking of topsoil and prior to installation of sod.

D. Apply fertilizer no more than 48 hours before laying sod.

E. Mix fertilizer thoroughly into upper 4 inches of topsoil.

F. Lightly water soil to aid dissipation of fertilizer.

3.5 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 tight with no open joints visible, and no overlapping; stagger end joints 12 inches minimum. Do not stretch or overlap sod pieces.

D. Lay smooth. Align with adjoining grass areas.

E. Place top elevation of sod 1/2 inch below adjoining edging, paving, curbs, sidewalks or flatwork.

F. On slopes 3:1 (Horizontal:Vertical) and steeper, lay sod perpendicular to slope and secure every row with wooden pegs at maximum 2 feet on center. When using big roll , lay sod parallel to slope. Drive pegs flush with soil portion of sod.

G. Do not place sod when temperature is lower than 32 degrees F.

H. Watering: Immediately after the area is sodded, it shall be watered with a minimum of 5 gallons of water per square yard or at 10 day intervals as needed and as directed by the Engineer. Water shall be applied a minimum rate of 3 gallons per square yard as required or as directed by the Engineer until final acceptance or until the grass uniformly reaches 2 1/2 inches in height.

I. After sod and soil have dried, roll sodded areas to bond sod to soil and to remove minor depressions and irregularities.

3.6 MAINTENANCE

A. Mow grass at regular intervals to maintain at maximum height of 2-1/2 inches. Do not cut more than 1/3 of grass blade at each mowing.

B. Neatly trim edges and hand clip where necessary.

C. Immediately remove clippings after mowing and trimming.

D. Water to prevent grass and soil from drying out.

E. Roll surface to remove or irregularities.

F. Control growth of weeds. Apply herbicides. Remedy damage resulting from improper use of herbicides.

G. Immediately replace sod on areas showing deterioration or bare spots.

H. Protect sodded areas with warning signs during maintenance period.

END OF SECTION

SECTION 33 01 30 – FRAMES, GRATES, RINGS AND COVERS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Construction of frames, grates, rings and covers.
2. Raising manhole frames and covers.
3. Replacing manhole frames and covers.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Frames, Grates, Rings and Covers will not be measured and payment for furnishing all materials, tools, equipment, labor and incidentals necessary to complete the work will be included in the Bid items which constitute the complete structures.

1.3 REFERENCES

A. ASTM International:
1. ASTM A48/A48M - Standard Specification for Gray Iron Castings.
2. ASTM C32 - Standard Specification for Sewer and Manhole Brick (Made from Clay or Shale).
3. ASTM C531 - Standard Test Method for Linear Shrinkage and Coefficient Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes.
4. ASTM C642 - Standard Test Method for Density, Absorption, and Voids in Hardened Concrete.
5. ASTM C672 - Standard Test Method for Scaling Resistance of Concrete Surfaces Exposed to Deicing Chemicals.
6. ASTM C990 - Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants.
7. ASTM D395 - Standard Test Method for Rubber Property - Compression Set.
8. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
9. ASTM D573 - Standard Test Method for Rubber-Deterioration in an Air Oven.
10. ASTM D575 - Standard Test Methods for Rubber Properties in Compression.
11. ASTM D2240 - Standard Test Method for Rubber Property-Durometer Hardness.
12. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
13. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.

1.4 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures: Requirements for submittals.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Record actual grade adjustment elevation of manhole.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum five years documented experience.

B. Installer: Company specializing in performing work of this section with minimum three years documented experience.

1.7 PRE-INSTALLATION MEETINGS – Not Used

1.8 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Accept materials on site in undamaged, unopened container, bearing manufacturer's original labels. Inspect for damage.

C. Protect materials from damage by storage in secure location.

1.9 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.10 COORDINATION – Not Used

PART 2 PRODUCTS

2.1 FRAMES, GRATES, RINGS AND COVERS

A. Manufacturers:
1. East Jordan Iron Works (EJ Group, Inc.).
2. Neenah Foundry (Neenah Enterprises, Inc.).
3. Substitutions: Section 01 60 00 - Product Requirements.

2.2 MATERIALS

A. Welded Steel:
1. Welded steel grates and frames shall conform to the member, size, dimensions and details indicated and shall be welded into an assembly in accordance with those details. Steel shall conform to the requirements of ASTM A36.

B. Castings:
1. Castings, whether Carbon-Steel, Gray Cast Iron or Ductile Iron shall conform to the shape and dimensions indicated and shall be clean substantial castings, free from sand or blowholes or other defects. Surfaces of the castings shall be free from burnt on sand and shall be reasonably smooth. Runners, risers, fins and other cast on pieces shall be

removed from the castings and such areas ground smooth. Bearing surfaces between manhole rings and covers or grates and frames shall be cast or machined with such precision that uniform bearing shall be provided throughout the perimeter area of contact. Pairs of machined castings shall be matchmarked to facilitate subsequent identification at installation.

2. Steel castings shall conform to ASTM A27, Mild to Medium Strength Carbon Steel Castings for General Application. Grade 70-36 shall be furnished unless otherwise specified.
3. Cast iron castings shall conform to ASTM A48, Gray Iron Castings, Class 30.
4. Ductile Iron castings shall conform to ASTM A536, Ductile Iron Castings. Grade 60-40-18 shall be used unless otherwise indicated.

C. Rings:
1. ASTM A536, Gray Iron Castings.
2. Precast Concrete: Project Notes.

D. Nuts and Bolts:
1. Stainless Steel ASTM F593.

E. Mortar:
1. Mortar for bedding castings shall consist of one part cement and 3 parts sand.

F. Accessories:
1. Joint Sealant: ASTM C990.

PART 3 EXECUTION

3.1 EXAMINATION – Not Used

3.2 CONSTRUCTION METHODS

A. Frames, grates, rings and covers shall be constructed of the materials as specified and in accordance with the details indicated and shall be placed carefully to the lines or grades indicated or as directed by the Engineer.

B. All welding shall conform to the requirements of the AWS-D-1-72. Welded frames, grates, rings and covers shall be hot-dipped galvanized (ASTM F1554).

C. Painting of gray iron castings will not be required, except when used in conjunction with structural steel shapes.

3.3 EXISTING WORK

A. Saw cut existing paving.

B. Excavate.

C. Clean manholes.

D. Remove existing manhole frames and covers.

E. Repair waterproofing.

3.4 RAISING MANHOLE FRAMES AND COVERS

A. Locate and raise manholes to grade as indicated on Drawings.

B. Use precast concrete manhole rings to achieve elevation indicated for frame and cover.

C. Do not adjust elevation more than 12 inches with manhole rings.

D. Seal joints between manhole top, rings, and frame with sealant.

E. Reinstall removed manhole frame and cover.

3.5 REPLACING MANHOLE FRAMES AND COVERS – Not Used

3.6 PAVING RESTORATION

A. Restore paving areas in accordance with Project Notes.

END OF SECTION

SECTION 33 01 32 - SEWER AND MANHOLE TESTING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Testing Manholes:
      a. Vacuum Test.
      b. Exfiltration Test.
   2. Testing Gravity Sewer Piping:
      a. Low-pressure Air Test.
      b. Infiltration Test.
   3. Hydrostatic Testing Pressure Piping.
   4. Deflection Testing.

1.2 REFERENCES

A. ASTM International:
   1. ASTM C1244 - Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill.
   2. ASTM D2122 - Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings.

1.3 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures: Requirements for submittals.

PART 2 PRODUCTS

2.1 VACUUM TESTING EQUIPMENT

A. Vacuum pump.

B. Vacuum line.

C. Vacuum tester base with compression band seal and outlet port.

D. Shut-off valve.

E. Stop watch.

F. Plugs.

G. Vacuum gauge, calibrated to 0.1 inch Hg

2.2 EXFILTRATION TEST EQUIPMENT

A. Plugs.

B. Pump.

C. Measuring device.

2.3 AIR TEST EQUIPMENT

A. Air compressor.

B. Air supply line.

C. Shut-off valves.

D. Pressure regulator.

E. Pressure relief valve.

F. Stop watch.

G. Plugs.

H. Pressure gauge, calibrated to 0.1 psi.

2.4 INFILTRATION TEST EQUIPMENT

A. Weirs.

2.5 HYDROSTATIC TEST EQUIPMENT

A. Hydro pump.

B. Pressure hose.

C. Water meter.

D. Test connections.

E. Pressure relief valve.

F. Pressure gauge, calibrated to 0.1 psi.

2.6 DEFLECTION TEST EQUIPMENT

A. Go, No-Go mandrels.

B. Pull/retrieval ropes.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify manholes and piping are ready for testing.

B. Verify trenches are backfilled.

C. Verify pressure piping concrete reaction support blocking or mechanical restraint system is installed.

3.2 PIPING PREPARATION

A. Lamping:
   1. Lamp gravity piping after flushing and cleaning.
   2. Perform lamping operation by shining light at one end of each pipe section between manholes; observe light at other end; reject pipe not installed with uniform line and grade; remove and reinstall rejected pipe sections; re-clean and lamp until pipe section achieves uniform line and grade.

B. Plug outlets, wye-branches and laterals; brace plugs to resist test pressures.

3.3 FIELD QUALITY CONTROL

A. Sections 01 40 00 - Quality Requirements and 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Testing Gravity Sewer Piping:
   1. Low-pressure Air Test:
      a. Test each section of gravity sewer piping between manholes.
      b. Introduce air pressure slowly to approximately 4 psig.
         1) Determine ground water elevation above spring line of pipe for every foot of ground water above spring line of pipe, increase starting air test pressure by 0.43 psig; do not increase pressure above 10 psig.
      c. Allow pressure to stabilize for at least five minutes. Adjust pressure to 3.5 psig or increased test pressure as determined above when ground water is present. Start test.
      d. Test:
         1) Determine test duration for sewer section with single pipe size from the following table. Do not make allowance for laterals.

Nominal Pipe Size, inches	Minimum Test Time, min/ 100 feet
6	0.7
8	1.2
10	1.5
12	1.8
15	2.1
18	2.4
21	3.0
24	3.6

27	4.2
30	4.8
33	5.4
36	6.0

2) Record drop in pressure during test period; when air pressure has dropped more than 1.0 psig during test period, piping has failed; when 1.0 psig air pressure drop has not occurred during test period, discontinue test and piping is accepted.
3) When piping fails, determine source of air leakage, make corrections and retest; test section in incremental stages until leaks are isolated; after leaks are repaired, retest entire section between manholes.

2. Test pipe larger than 36 inches diameter with exfiltration test not exceeding 100 gallons for each inch of pipe diameter for each mile per day for each section under test. Perform test with minimum positive head of 2 feet.
3. Infiltration Test:
   a. Use only when gravity piping is submerged in ground water minimum of 4 feet above crown of pipe for entire length being tested.
   b. Maximum Allowable Infiltration: 100 gallons per inch of pipe diameter for each mile per day for section under test, include allowances for leakage from manholes. Perform test with minimum positive head of 2 feet.

C. Pressure test system in accordance with AWWA C600 and the following:
1. Hydrostatically test each portion of pressure piping, including valved section, at 1.5 times working pressure of piping based on elevation of lowest point in piping corrected to elevation of test gauge.
2. Conduct hydrostatic test for at least two-hour duration.
3. Fill section to be tested with water slowly, expel air from piping at high points. Install corporation cocks at high points. Close air vents and corporation cocks after air is expelled. Raise pressure to specified test pressure.
4. Observe joints, fittings and valves under test. Remove and renew cracked pipe, joints, fittings, and valves showing visible leakage. Retest.
5. Correct visible deficiencies and continue testing at same test pressure for additional 2 hours to determine leakage rate. Maintain pressure within plus or minus 5.0 psig of test pressure. Leakage is defined as quantity of water supplied to piping necessary to maintain test pressure during period of test.
6. Compute maximum allowable leakage by the following formula:

$L = (SD\sqrt{P})/C$
L = testing allowance, in gallons per hour
S = length of pipe tested, in feet
D = nominal diameter of pipe, in inches
P = average test pressure during hydrostatic test, in psig
C = 148,000
When pipe under test contains sections of various diameters, calculate allowable leakage from sum of computed leakage for each size.

7. When test of pipe indicates leakage greater than allowed, locate source of leakage, make corrections and retest until leakage is within allowable limits. Correct visible leaks regardless of quantity of leakage.

D. Deflection Testing of Plastic Sewer Pipe:
1. Perform vertical ring deflection testing on PVC sewer piping, after backfilling has been in place for at least 30 days.
2. Allowable maximum deflection for installed sewer pipe limited to 5 percent of original vertical internal diameter.
3. Perform deflection testing using properly sized rigid ball or 'Go, No-Go' mandrel.
4. Furnish rigid ball or mandrel with diameter not less than 95 percent of base or average inside diameter of pipe as determined by ASTM standard to which pipe is manufactured. Measure pipe in compliance with ASTM D2122.
5. Perform test without mechanical pulling devices.
6. Locate, excavate, replace and retest pipe exceeding allowable deflection.

E. Testing Manholes:
1. General: Test using air whenever possible prior to backfilling to assist in locating leaks. Make joint repairs on both outside and inside of joint to ensure permanent seal. Test manholes with manhole frame set in place.
2. Vacuum test in accordance with ASTM C1244 and as follows:
   a. Plug pipe openings; securely brace plugs and pipe.
   b. Inflate compression band to effect seal between vacuum base and structure; connect vacuum pump to outlet port with valve open; draw vacuum to 10 inches of Hg; close valve; start test.
   c. Test:
      1) Determine test duration for manhole from the following table:

Manhole Diameter	Test Period
4 feet	60 seconds
5 feet	75 seconds
6 feet	90 seconds

      2) Record vacuum drop during test period; when vacuum drop is greater than 1 inch of Hg during test period, repair and retest manhole; when vacuum drop of 1 inch of Hg does not occur during test period, discontinue test and accept manhole.
      3) When vacuum test fails to meet 1 inch Hg drop in specified time after repair, repair and retest manhole.
3. Exfiltration Test:
   a. Plug pipes in manhole; remove water in manhole; observe plugs over period of not less than 2 hours to ensure there is no leakage into manhole.
   b. Determine ground water level outside manhole.
   c. Fill manhole with water to top of cover frame. Prior to test, allow manhole to soak from minimum of 4 hours to maximum of 72 hours; after soak period, adjust water level inside manhole to top of cover frame.
   d. Measure water level from top of manhole frame; at end of 4 hour test period, again measure water level from top of manhole frame; compute drop in water level during test period.

e. Manhole exfiltration test is considered satisfactory when drop in water level is less than values listed in table below:

Manhole Depth (feet)	Allowable Leakage inches for Manhole Diameter		
	4 feet	5 feet	6 feet
4	0.11	0.14	0.17
6	0.17	0.21	0.26
8	0.23	0.29	0.35
10	0.28	0.35	0.42
12	0.34	0.43	0.51
14	0.40	0.50	0.60
16	0.45	0.56	0.68
18	0.51	0.64	0.77
20	0.57	0.71	0.86
22	0.62	0.78	0.93
24	0.68	0.85	1.02
26	0.74	0.93	1.11
28	0.79	0.99	1.19
30	0.85	1.06	1.28

4. When unsatisfactory test results are achieved, repair manhole and retest until result meets criteria; repair visible leaks regardless of quantity of leakage.

END OF SECTION

SECTION 33 01 37 – PIPE BURSTING OF GRAVITY SEWER MAINS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Cleaning and flushing existing sanitary sewers.
   2. Video taping existing sewers.
   3. Pipe bursting existing sewers.
   4. Reestablishing service connections.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Pipe Bursting Sewers:
   1. Basis of Measurement: By linear foot.
   2. Basis of Payment: Includes pipe cleaning and flushing, TV inspection and video taping, bypass pumping, and pipe bursting (to include replacement pipe).

1.3 REFERENCES

A. American Society for Testing Materials (ASTM), West Conshohocken, PA 14428:
   1. ASTM D1238-99.
   2. ASTM D1505-98.
   3. ASTM D790-00.
   4. ASTM D638-99.
   5. ASTM D1693-00.
   6. ASTM D3350-99.
   7. ASTM D618-99.
   8. ASTM D2837-98a.
   9. ASTM D575.

1.4 DESIGN REQUIREMENTS

A. Design pipe material to have sufficient structural strength to support dead loads, live loads and groundwater load imposed.

B. Design pipe material to provide jointless and continuous structurally sound construction able to withstand imposed static, dynamic and hydrostatic loads on long-term basis.

1.5 PERFORMANCE REQUIREMENTS

A. Perform pipe bursting and reestablish service connections without need for excavation while minimizing disruptions to adjacent occupied building and traffic.

B. Excavate for point repairs only on emergency basis and as permitted by Engineer or Owner.

1.6 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures: Requirements for submittals.

1.7 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Record actual locations of each service connection.

1.8 QUALITY ASSURANCE

A. Perform Work in accordance with International Pipe Bursting Association's Guideline for Pipe Bursting.

B. Contractor is solely responsible for quality assurance during the length of the project. Contractor is responsible for any costs associated with corrective measures required to replace or repair items not meeting the quality standards.

1.9 QUALIFICATIONS – Not Used

1.10 PRE-INSTALLATION MEETINGS – Not Used

1.11 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Receive, store, and protect pipe materials.

1.12 FIELD MEASUREMENTS

A. Verify field measurements of pipes prior to design, fabrication, and delivering of materials.

1.13 COORDINATION

A. Coordinate work with users connected to system.

B. Notify home owners and businesses at least forty-eight hours in advance of expected disruption of sanitary service.

C. Limit disruption of services to one-time occurrence for maximum of eight hours.

D. Provide and maintain temporary facilities including piping and pumps to meet requirements.

PART 2 PRODUCTS

2.1 HDPE PIPE

A. Furnish materials in accordance with International Pipe Bursting Association's Guideline Specification for the Replacement of Mainline Sewer Pipes by Pipe Bursting.

B. Materials:
   1. Shall be PE 4710 high density polyethylene meeting ASTM D3350 cell classification 445574C (formerly PE 3408 meeting 345464C per ASTM D3350-02). The material shall be listed and approved for potable water in accordance with NSF/ANSI 61. Pipe shall be manufactured in accordance with AWWA C901-96 for sizes 1-1/4 thru 3 IPS diameters and to the requirements of ASTM D3035. Pipe 4 IPS and DIPS sizes 4 and above shall be manufactured to the requirements of ASTM F714 and AWWA C906-99.
   2. HDPE pipe and fittings will be used in accordance with the material specifications. All additional appurtenances (manholes, tees, gaskets, etc.) will meet the material specifications. All pipe installed by pipe bursting will be joined by butt-fusion, electro fusion, or full circle repair clamp.
   3. All pipe shall be made of virgin material. No rework material except that obtained from the manufacturers own production of the same formulation shall be used.
   4. The pipe shall be homogeneous throughout and shall be free of visible cracks, holes, foreign material, blisters, or other deleterious faults.
   5. Pipe color shall be solid black unless otherwise specified in these contract documents.
   6. HDPE pipe shall be Iron Pipe Size (IPS) unless otherwise specified in these contract documents.
   7. Dimension Ratios: The minimum wall thickness of the HDPE pipe shall be DR17.

2.2 PIPE JOINING FOR TERMINAL SECTIONS OF HDPE PIPE

A. The polyethylene pipe shall be assembled and joined at the site using the butt-fusion method to provide a leak proof joint. Threaded or solvent-cement joints and connections are not permitted. All equipment and procedures used shall be in strict compliance with the manufacturer's recommendations. Fusing shall be accomplished by personnel certified as fusion technicians by a manufacturer of polyethylene pipe and/or fusing equipment.

B. Terminal sections may also be joined by Electrofuse Couplings by Central Plastic Company, Friatec, or approved equal.

C. Terminal sections may also be joined by Full Circle Repair Clamps by Smith Blair, JCM, or approved equal.

2.3 SEWER SERVICE CONNECTIONS

A. Materials:
   1. Sewer service connections to the HDPE main may be made by Plastic Saddles with Stainless Steel Straps, by GPK or approved equal or Rubber Saddles with Stainless Steel Straps by Fernco Company, DFW, or approved equal.
   2. Sewer service connections to the main may also be made with Electrofusion Saddles by Central Plastics, Friatec, or approved equal.

3. Sewer service connections to the main may also be made with Inserta Tees by Fowler Manufacturing.

2.4 SEALING MANHOLES

A. Materials:
1. The annular space at each manhole may be sealed with Oakum saturated with Avanti 202 or approved equal and covered with a quick setting grout.
2. The annular space at each manhole may also be sealed with a water stop gasket by Fernco Company or approved equal and finished with a quick setting grout.

2.5 SOURCE QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Testing, inspection, and analysis requirements.

B. Inspect each lot of pipe for defects.

PART 3 EXECUTION

3.1 EXAMINATION – Not Used

3.2 CLEANING AND FLUSHING

A. Clean existing sewer pipes of debris and sedimentation as needed.

3.3 INITIAL VIDEO INSPECTION AND REPAIR

A. Conduct closed-circuit video inspection

B. Determine condition of existing piping, degree of offset of joints, crushed walls, and obstructions.

C. Determine sizes and locations of service entrances and service connections.

3.4 BYPASSING SEWAGE

A. Set up bypassing pump system to isolate each section of piping when and where necessary.

B. Provide flow diversion with pumps adequate in size and capacity to handle all flows generated during the pipe bursting process.

C. Maintain bypass pumping until service connections reestablished.

D. All costs shall be incidental unless specific pay items for this work are included in the Bid Proposal.

3.5 INSTALLATION

A. Establish access points with Engineer or as shown on drawings.

B. All sewer service connections shall be located (physically dug up) prior to pipe bursting the main by pre-CCTV inspection.

C. If the pre-CCTV inspection reveals obstructions or pipe materials that will prevent the existing pipe from being pipe burst properly and cannot be removed by conventional cleaning equipment, a point repair will be made by the Contractor, with approval from Owner/Engineer. Separate payment for this work will be made and it is not considered incidental to the pipe bursting process.

D. If the pre-CCTV inspection reveals a sag or hump, a sag or hump removal will be made by the Contractor, with approval from Owner/Engineer. Separate payment for this work will be made and it is not considered incidental to the pipe bursting process.

E. Before any excavation is done for any purposes, Contractor shall contact the appropriate One Call agency for determining field locations of existing utilities.

F. The polyethylene pipe shall be assembled and joined at the site using the butt-fusion method to provide a leak proof joint. Threaded or solvent-cement joints and connections are not permitted. All equipment and procedures used shall be in compliance with the manufacturer's recommendations. Fusing shall be accomplished by personnel certified as fusion technicians by a manufacturer of HDPE pipe and/or fusing equipment.

G. The butt-fused joint shall be in true alignment and shall have uniform rollback beads resulting from the use of proper temperature and pressure. The joint shall be allowed adequate cooling time before removal of pressure. The fused joint shall be watertight and shall have tensile strength equal to that of the pipe. All defective joints shall be cut out and replaced at the expense of Contractor.

H. Service connections to the HDPE pipe shall be made with materials submitted and approved listed in this section.

I. An appropriate relaxation period shall be allowed prior to making service connections and connecting to manholes. The relaxation period shall be appropriate with and dependent upon site conditions, as determined by Contractor.

J. If concrete easements are encountered, a point repair shall be performed to excavate and break out concrete prior to the bursting operation to allow the steady and free passage of the pipe bursting head, with approval from Owner/Engineer. Separate payment for this work will be made and it is not considered incidental to the pipe bursting process.

K. The new HDPE pipe shall be inserted immediately behind the bursting head in accordance with the manufacturer's recommended procedures. The bursting tool shall be specifically designed and manufactured for the type of insertion process being used. It shall be utilized to guide and assist the bursting head during the operation. A pushing machine may be utilized to aid pipe insertion from the rear.

L. New HDPE pipe shall extend a minimum of 6 into each manhole. The annular space shall be sealed at each manhole with Oakum saturated with Avaniti 202 or a Water Stop Gasket (listed in this section) and finished with a quick setting grout.

M. No infiltration of groundwater is permitted. No visual defects are allowed.

3.6 SERVICE CONNECTIONS

A. Make connections with materials submitted and approved.

B. Services shall be reconnected as to minimize disruption of service.

C. Services shall be the size indicated in the drawings and specifications.

D. After reestablishing service connection, flush piping clean.

3.7 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.

3.8 CLEANING

A. Remove debris resulting from work and unused materials from site and legally dispose.

END OF SECTION

SECTION 33 01 38 – PIPE BURSTING OF POTABLE WATER MAINS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Documentation and planning process.
   2. Temporary service or pre-chlorination of product pipe.
   3. Pipe bursting existing water mains.
   4. Reestablishing service connections.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Pipe Bursting Potable Water Mains:
   1. Basis of Measurement: By linear foot.
   2. Basis of Payment: Includes documentation and planning, inspection of existing utilities, temporary service or pre-chlorination of product pipe, pipe bursting (to include replacement pipe), and reestablishment of service connections.

1.3 REFERENCES

A. International Pipe Bursting Association (IPBA)

B. ASTM International:
   1. ASTM D3035 – Std. Spec. for PE (DR-PR) Pipe, based on Controlled Outside Diameter.
   2. ASTM F585 – Standard Guide for Insertion of Flexible Polyethylene Pipe into a Host Pipe of Conduit.
   3. ASTM F1055 – Standard Specification for Electro-fusion Couplings.
   4. ASTM A 240 – Standard Specification for Chromium and Nickel Chromium Stainless Plate, Sheet and Strip.

C. American Water Works Association
   1. AWWA C901 - Polyethylene (PE) Pressure Pipe and Tubing ½ to 3 For Water Service.
   2. AWWA C906 - Polyethylene (PE) Pressure Pipe and Fittings 4 to 63 For Water Distribution and Transmission.
   3. AWWA C651 – Standard for Disinfecting Water Mains.

1.4 DESIGN REQUIREMENTS

A. Design pipe material to have sufficient structural strength to support dead loads, live loads and groundwater load imposed.

B. Design pipe material to provide jointless and continuous structurally sound construction able to withstand imposed static, dynamic and hydrostatic loads on long-term basis.

1.5 PERFORMANCE REQUIREMENTS

A. Perform pipe bursting and reestablish service connections without need for excavation while minimizing disruptions to adjacent occupied buildings and traffic.

B. Excavate for point repairs only on emergency basis and as permitted by Engineer or Owner.

1.6 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures: Requirements for submittals.

1.7 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents provided by the Owner shall be marked by the contractor to show actual location of services, fittings, fire hydrants and other reconnects. These markups shall be done the day of the actual placement. A set of marked up plans shall be returned to the Owner within 15 days of substantial completion of job.

C. The following as recorded construction data is required from the contractor and/or fusion service provider (if applicable) to the project owner or pipe manufacturer upon request:
   1. Approved fusion data logger device reports.
   2. Butt-Fusion-Joint documentation containing the following information:
      a. Pipe Diameter and Nominal Wall Thickness
      b. Fusion Machine Model and Size Range
      c. Fusion Technician Identification
      d. Job Identification
      e. Fusion Joint Number
      f. Fusion, Heating, and Drag Pressure Settings
      g. Heat Plate Temperature
      h. Time Stamp
      i. Heating and Cool Down Times of Fusion
      j. Ambient Temperature

D. Post Construction Certificate of Compliance – A Certificate of Compliance shall be supplied stating the product pipe, fittings, and all joints and connections have been supplied and installed in accordance with the project specifications, and as approved by the Owner.

1.8 CHLORINATION SUBMISSION DOCUMENTS

A. Pipes pre-chlorinated with intent to install under this specification must have a log sheet placed in a sealed waterproof envelope attached to the pipe at the start of the Chlorination process. This sheet makes up the Chlorination Submission Documents and shall be delivered to the Authority at the same time as the marked up construction drawings. Information on the log sheet shall at a minimum include:
   1. Date of swabbing.
   2. Date of chlorinating and amount of chlorine used.
   3. Date of samplings.

4. Results of sample tests.
5. Date of pipe installation.
6. Date of pressure test.
7. Makeup water details (if any).
8. End test pressure.
9. Final pressure test results.
10. Location of installation.

1.9 QUALITY ASSURANCE

A. Perform Work in accordance with International Pipe Bursting Association's Guideline for Pipe Bursting.

B. Contractor is solely responsible for quality assurance during the length of the project. Contractor is responsible for any costs associated with corrective measures required to replace or repair items not meeting the quality standards.

1.10 QUALIFICATIONS – Not Used

1.11 PRE-INSTALLATION MEETINGS – Not Used

1.12 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Receive, store, and protect pipe materials.

1.13 FIELD MEASUREMENTS

A. Verify field measurements of pipes prior to design, fabrication, and delivering of materials.

1.14 COORDINATION

A. Coordinate work with users connected to system.

B. Notify home owners and businesses at least forty-eight hours in advance of expected disruption of service.

C. Limit disruption of service to individual properties to one-time occurrence for maximum of eight hours.

D. Provide and maintain temporary facilities including piping, fittings, valves and all necessary appurtenances to meet requirements.

PART 2 PRODUCTS

2.1 HDPE PIPE

A. Furnish materials in accordance with International Pipe Bursting Association.

B. Materials:
1. Shall be PE4710 pipe must be qualified by the manufacturer for use in pressure-rated potable water delivery systems and fire protection piping systems, conforming to all standards and all testing and material properties as described in applicable pipe specification and/or plans, as follows:
2. Polyethylene Plastic Pipe shall be High Density Polyethylene Pipe (HDPE) and meet applicable requirements of either : AWWA C906, or AWWAC901, or, ASTMD3035, or ASTM F714; and NSF 61, and Municipal-Project Water Pipe Specifications. All HDPE pipe shall be of virgin material, with an allowance of 0% up to 30%, by weight, of in-plant reprocessed compounded pelletized black polyethylene resin.
3. HDPE pipe and fully-pressure rated fabricated and molded PE4710 fittings will be produced and used in accordance with the project specifications and product standards. All other additional appurtenances shall meet their appropriate material and product specifications, as approved by the water utility. All pipe installed by pipe bursting will be joined by butt fusion, electro fusion, or restrained' full circle mechanical clamps, or other devices qualified and specified by the engineer of record, and approved by the water utility. Mechanical connections of HDPE pipe to other pipe mains, shall use an internal wedge-type stiffener made of #304 SS.
4. PE4710 pipe will be produced from resin meeting the specifications of ASTM D3350 cell classification PE445574C, and will meet the product requirements of either ASTM D3035, AWWA C901 or C906, or, ASTM F714. HDPE pipe shall meet the minimum thermal stability requirements of ASTM D3350. Pipe will be legibly marked at intervals of no more than five feet with at least : manufacturer's name, trademark, pipe Diameter, HDPE designation, Dimension Ratio (DR) or pressure class, reference standard: ASTM D3035, AWWA C901 or C906, and date of manufacture and point of origin.
5. Pipe color shall be solid black unless otherwise specified in contract documents. Blue color surface stripes and print-lines are allowed.
6. Dimension Ratios: The maximum DR of the PE4710 pipe shall be: DR 17, which provides 125-psi operating working pressure at 73^0F with instant flow (surge) velocity changes of 5 FPS or less; 189-psi repetitive-surge peak pressure; 250-psi occasional-surge peak pressure, and rupture pressure of 500-psi. Thicker wall PE4710 pipe of lower DR is acceptable and may be specified by the project engineer of record.
7. Service Tubing connections shall have the same or greater pressure rating as the pipe main itself. Service connections may be branch saddle, sidewall electro-fusion, or approved mechanical saddles with a pressure rating equal to or greater than the pressure rating of the HDPE pipe main itself.
8. Terminal Connections from polyethylene pipe to Ductile-iron or PVC pipe may be made using approved AWWA C110 fittings, with a pressure rating meeting at least 200-psi, as approved by the Water Utility.

2.2 SOURCE QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Testing, inspection, and analysis requirements.

B. Inspect each lot of pipe for defects.

2.3 PIPE BURSTING EQUIPMENT

A. General - The pipe bursting system shall be designed and manufactured to force its way through the existing line by fragmenting the pipe wall and compressing the wall segments into the surrounding soil as it progresses. The bursting unit shall generate sufficient force to burst and expand the existing pipeline, compact the native soil creating a temporary tunnel, and provide for the insertion of the replacement polyethylene pipe.

B. Allowable Types of Pipe Bursting System and Methods:
   1. Static Pipe Bursting Systems
      a. Static pipe bursting systems shall be characterized by a tapered or blunt nosed bursting head being pulled through the host pipe and breaking the host pipe by applying radial pressure to the host pipe. The host pipe fails by hoop' tensile stress applied by the bursting head, and is fragmented and pushed into the surrounding bedding and soil as the bursting head progresses.
      b. The bursting head shall be followed by an expansion head which shall further push the fragmented pipe into the surrounding soil and bedding to a diameter that allows the insertion of the replacement pipe behind it. Under no circumstances shall the metallic pipe pull head, to which is attached the replacement plastic pipe, be used to expand or otherwise increase the diameter of the host pipe, or fragmented host pipe.
      c. The expansion head and pull head may be advanced by a hydraulic or winching mechanism, and may be connected by means of a cable, chain, or rod.
   2. Hydraulic Pipe Bursting Systems
      a. Hydraulic pipe bursting systems shall be characterized by a pull head that is equipped with hydraulically actuated levers' that break the host pipe by applying radial pressure to the host pipe. The host pipe fails by hoop' tensile stress applied by the levers in the head, and is fragmented and pushed into the surrounding bedding and soil as the pull head progresses.
      b. The pull head shall be followed by an expansion head which shall further push the fragmented pipe into the surrounding soil and bedding to a diameter that allows the insertion of the liner pipe behind it. Under no circumstances shall the pipe pull head, which is attached directly to the liner pipe, be used to expand or otherwise increase the diameter of the host pipe, or fragmented host pipe.
      c. The pull head may be advanced by a hydraulic or winching mechanism, and may be connected by means of a cable, chain, or rod.
   3. Pneumatic or Percussion Pipe Bursting System
      a. UNDER NO CIRCUMSTANCES SHALL PNEUMATIC OR PERCUSSIVE BURSTING SYSTEMS BE ALLOWED.
   4. Bursting Lubricants and Grouts
      a. Bursting lubricants and grout may be used at the request of the pipe bursting contractor and with the discretionary approval of the Owner and Engineer.
      b. Lubricants shall be chemically compatible for long term contact with polyethylene pipe.
   5. Pipe Pull Heads
      a. Pipe pull heads shall be utilized that employ a positive through-bolt design providing a smooth wall against the pipe cross-section at all times.

b. Pipe pull heads shall be specifically designed for use with polyethylene pipe, and shall be designed as recommended by the pipe bursting contractor, so as to provide the full tensile strength of the plastic pipe in axial tension.

6. Pipe Rollers
   a. Pipe rollers, if required, shall be of sufficient size to fully support the weight of the pipe during handling and pullback operations.
   b. A sufficient quantity of rollers and spacing, per the pipe supplier's guidelines shall be used to assure adequate support and resist excessive sagging of the product pipe.

2.4 OUTLINE METHOD OF PRE-CHLORINATION OF HDPE PIPE

A. The contractor shall provide documented evidence of its successful replacement of asbestos cement pipe by pipe bursting using pre-chlorinated HDPE water pipe on at least one project.

B. Assuming all qualifications for skill and materials are met, the Pipe Bursting of Potable Water Mains using Pre-Chlorinated Pipe will repeat the method, outlined below for each section of pipe being rehabilitated. These processes may be performed in series or in parallel with other sections of pipe within the job; however each section will require these steps:
   1. Deliver notice of service outage to each affected property owner in advance of work.
   2. Chlorinate a length of product pipe that yields passing test results for potable water per AWWA, Regulatory Authority and City standards.
   3. Hydrostatic test of the product pipe section per City and Industry Guidelines.
   4. Excavate a Burst Pit at one end of the section down to pipe grade for placement of the pipe bursting equipment.
   5. Excavate an Insertion Pit at the opposite end of the section down to pipe grade for entry of the product pipe.
   6. Excavate Service Connection Pits.
   7. Isolate the section to be rehabilitated from the rest of the system so as to maintain pressure integrity of the system as well as preventing any backflow of chlorinated solution or non-potable water into the potable water pipe system.
   8. Excavate and remove hydrant tees and valve tees from the host pipe.
   9. Rod string to be assembled as it is thrust through the host pipe from Burst Pit to Insertion Pit.
   10. Burst tooling and polyethylene water pipe attached to rod end at Entry Pit.
   11. Rod string pulled back and disassembled simultaneously while tooling and product pipe travels from Insertion Pit to Burst Pit.
   12. Service Connections shall be made to the newly installed main.
   13. Super-Chlorinate main for 15 minutes to 300 ppm. A de-chlorination unit will be used to neutralize the residual chlorine when flushing. Flush the newly installed main with potable water.
   14. Inspect for leaks at new connections.
   15. Final connection of the replaced section of pipe into the system.

C. It should be noted that item 4 through 14 are to be accomplished within a single 10 hour day to eliminate the need for any temporary services. The length of pipe to be burst per run should be chosen to conform to this time frame. Items 4 though 6 (excavation items) may be performed one day prior to bursting operations to expedite the installation process.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify location of piping.

3.2 DELIVERY, STORAGE AND HANDLING

A. Transport, handle and store polyethylene pipes and fittings as recommended by the manufacturer and industry best practices. If new pipe and fittings become damaged before or during installation, it shall be repaired as recommended by the manufacturer or replaced as required by the Owner, at the Contractor's expense, before proceeding further. Deliver, store and handle other materials as required to prevent damage.

3.3 CLEANING AND TV INSPECTION OF EXISTING HOST PIPELINE

A. The host pipe shall be cleaned and inspected by TV prior to the bursting operation in accordance with, and if required by the contract documents.

B. Cleaning and TV inspection of the host pipe shall indicate condition of host pipe and suitability of host pipe for replacement pipe insertion by pipe bursting methods.

C. Obstructions considered detrimental to the pipe bursting operation which may include corporation taps, valves and valve bodies, and collapsed piping shall be locally remedied prior to bursting and liner pipe insertion.

D. Spot repairs, excavations, or removals shall be made in accordance with the drawings and these specifications, or the guidance of the engineer and contractor team.

3.4 OBSTRUCTION REMOVAL

A. Identify any point repairs required, such as dropped joints, intruding service connections, collapsed pipe, sags in main or any other obstructions prior to the pipe bursting process. As necessary, the Contractor shall remove all obstructions to perform pipe bursting operation.

B. The contractor shall notify the inspector for approval to make an excavation after having exhausted all other options to remove any obstruction or retrieve any pipe bursting tool or camera from the water main.

3.5 LOCATION AND PROTECTION OF UNDERGROUND UTILITIES

A. Correct locations of all other underground utilities that may impact the installation is the responsibility of the Contractor.

B. Utility location and notification services shall be contacted by the Contractor prior to the start of construction.

C. All existing lines and underground utilities shall be positively identified, including exposing those facilities that are located within an envelope of possible impact of the bursting operation as determined for the project specific site conditions. It is the Contractor and pipe burst system operator's responsibilities to determine this envelope of safe burial depth and offset from existing utilities. This will include, but is not limited to soil conditions and layering, utility proximity and material, pipe bursting system and equipment, and foreign subsurface material.

3.6 EXCAVATION AND ACCESS PITS

A. The location of access pits shall be submitted to the Engineer prior to construction.

B. Access pit length shall be such that the minimum bending radius for the liner pipe, per the pipe supplier is maintained. Sheeting, shoring and bracing requirements and trench safety shall be the contractor's responsibility in accordance with these specifications and applicable jurisdictional standards.

C. Access pit excavations shall be performed at all points where the polyethylene pipe will be inserted into the existing pipeline. When possible, access pit excavations shall coincide with host pipe service connection points or other appurtenance installations.

D. The replacement pipe may be continuously or partially supported on rollers or other Owner and Engineer approved friction decreasing implements during joining and insertion, as long as the pipe is not over-stressed or critically abraded prior to or during installation.

3.7 PIPE BURSTING OPERATION

A. Any known pre-existing concrete encasements shall be excavated and broken out prior to the bursting operation to allow the steady and free passage of the pipe bursting head.

B. The new pipe shall be inserted immediately behind the bursting head in accordance with the pipe bursting equipment and pipe supplier's recommended procedures. The bursting equipment shall be specifically designed and manufactured for the type of insertion process being used.

C. Cuts or gouges, per ASTM F585 are acceptable up to 10% of wall thickness. Beyond 10% of wall, damage must be removed by cutting the damaged section from the pipe string and butt fusing the terminal ends together. A heavier wall pipe may be specified if adverse surface gouging is anticipated, thus providing a sacrificial layer', to endure gouging more than 10% of wall thickness, such that below the deepest gouge depth, the remaining ligament is at least 90% of the pipe wall thickness necessary to support the anticipated operating pressure range.

D. Immediately following the completion of a pipe bursting installation, if possible, the pipe should be pushed back into the location of the insertion, at the pulling head, until a small amount of movement is realized at the insertion pit on the other side of the installation from the pulling equipment, so as to relieve elastic and creep elongation. In hot summer months, thermal equilibrium considerations, from above ground to below ground, should be considered, as well.

3.8 PREPARATION PRIOR TO MAKING CONNECTIONS INTO EXISTING PIPING SYSTEMS

A. Approximate locations for existing piping systems are shown in the construction documents. Prior to making connections into existing piping systems, the contractor shall:
   1. Visit the field to verify location, size, piping material, and piping system of the existing pipe.
   2. Obtain all required fittings, which may include saddles, sleeve type couplings, flanges, tees, or others as shown in the construction documents.
   3. Have installed all temporary pumps and/or pipes in accordance with established connection plans.

B. Unless otherwise approved, new piping systems shall be completely assembled and successfully tested prior to making re-connections with existing pipe systems.

3.9 PIPE SYSTEM CONNECTION

A. Pipe connections shall be installed per applicable standards and regulations, as well as per the connection manufacturer's guidelines and as indicated in the construction documents. Pipe connections to structures shall be installed per applicable standards and regulations, as well as per the connection manufacturer's guidelines.

3.10 EXTERNAL SERVICE CONNECTIONS

A. In re-connection or reconstruction of existing water services, selected service connection pipe diameter must match existing service.

B. All water service connections shall be identified, located and excavated prior to any pipe construction.

C. Tapping completions for service connections shall be performed using sidewall fusion tap tees, electro-fusion tap tees, or standard mechanical tapping saddles designed for use on polyethylene piping. Tapping shall be performed only with the use of tapping tees, saddles, or sleeves. NO DIRECT TAPPING BY THREADING THE WALL OF THE POLYETHYLEN PIPE WILL BE PERMITTED. Tapping shall be performed in accordance with the applicable sections for Saddle Tapping.

D. All service connections requiring a larger diameter than originally installed, shall be made with a pipe connection as specified and indicated on the drawings.

E. Equipment used for tapping shall be made specifically for tapping HDPE pipe:
   1. If used, tapping bits shall be slotted shell style cutters, specifically made for HDPE pipe. Hole saws' made for cutting wood, steel, ductile iron, or other materials are strictly prohibited.
   2. Manually operated or power operated drilling machines may be used.

F. Taps may be performed while the pipeline is filled with water and under pressure (wet' tap,) or when the pipeline is not filled with water and not under pressure (dry' tap).

3.11 FIELD QUALITY CONTROL

A. See Section 01 40 00 – Quality Requirements

B. Testing: See Section 33 11 13 – Public Water Utility Distribution Piping.

3.12 DISINFECTION OF THE PIPELINE FOR POTABLE WATER PIPING

A. Once all pipe work is completed to the satisfaction of the Construction Manager, The Water Utility shall perform, as required, chlorine disinfection, sampling and analysis of the newly installed liner in accordance with the specifications and/or as ordered by the Engineer.

3.13 FINAL ACCEPTANCE

A. Upon completion of installation, testing and inspection, clean and restore project area affected by the pipe bursting work.

3.14 CLEANING

A. Remove debris resulting from work and unused materials from site and legally dispose.

END OF SECTION

SECTION 33 05 14 - MANHOLES AND STRUCTURES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Cast-in-Place concrete manholes and structures with transition to cover frame, covers, anchorage, and accessories.
   2. Modular precast concrete manholes and structures with tongue-and-groove joints with transition to cover frame, covers, anchorage, and accessories.
   3. Doghouse manhole connections to existing sanitary and storm sewer lines.
   4. Bedding, embedment, and backfill materials.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Manholes and Structures:
   1. Basis of Measurement: Per each.
   2. Basis of Payment: Includes excavating, concrete foundation slab, concrete structure sections, concrete structure construction, cover frame and cover, to indicated depth, forming and sealing pipe inlets and outlets.
   3. For manholes greater than five feet in depth, each additional foot above five feet shall be paid by the vertical foot.

1.3 REFERENCES

A. American Association of State Highway Transportation Officials:
   1. AASHTO M288 - Geotextiles.
   2. AASHTO M306 - Drainage Structure Castings.
   3. AASHTO M91 - Sewer and Manhole Brick (Made from Clay or Shale).

B. American Concrete Institute:
   1. ACI 530/530.1 - Building Code Requirements for Masonry Structures and Specifications for Masonry Structures.

C. ASTM International:
   1. ASTM A48/A48M - Standard Specification for Gray Iron Castings.
   2. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
   3. ASTM C32 - Standard Specification for Sewer and Manhole Brick (Made From Clay or Shale).
   4. ASTM C55 - Standard Specification for Concrete Brick.
   5. ASTM C361 - Standard Specification for Reinforced Concrete Low-Head Pressure Pipe.
   6. ASTM C478 - Standard Specification for Precast Reinforced Concrete Manhole Sections.
   7. ASTM C497 - Standard Test Methods for Concrete Pipe, Manhole Sections, or Tile.
   8. ASTM C913 - Standard Specification for Precast Concrete Water and Wastewater Structures.
   9. ASTM C923 - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals.

1.4 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures: Requirements for submittals.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum five years documented experience.

1.6 DELIVERY, STORAGE AND HANDLING

A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.

B. Comply with precast concrete manufacturer's instructions and ASTM C913 for unloading, storing and moving precast manholes and drainage structures.

C. Store precast concrete manholes and drainage structures to prevent damage to Owner's property or other public or private property. Repair property damaged from materials storage.

D. Mark each precast structure by indentation or waterproof paint showing date of manufacture, manufacturer, and identifying symbols and numbers shown on Drawings to indicate its intended use.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements.

B. Cold Weather Requirements: ACI 530/530.1.

PART 2 PRODUCTS

2.1 MANHOLES AND STRUCTURES

A. Furnish materials in accordance with TAC 217 standards.

B. Precast Concrete Manholes and Structures (Wastewater): Precast Reinforced Concrete Manhole sections shall be made from crushed limestone coarse aggregates and natural silica fine sand aggregates. The concrete shall be sulfate resistant concrete with Type V Portland Cement and antimicrobial admixture as per Paragraph 2.4(A). The maximum water-cement ratio shall be 0.40 and the 28-day concrete compressive strength shall not be less than 5000 psi and the absorption shall not exceed 9%. Fly ash may be used for up to 30% of the cementicious material provided it has been tested in accordance with ASTM C1012 and exhibits a positive sulfate resistance when used with the sulfate-resistant concrete mix design. Type C fly ash shall not be used in sulfate resistant concrete. The structure shall be moist-cured for a minimum period of four (4) days.

The minimum wall thickness of the manhole shall be as follows:

Manhole Size	Minimum Wall Thickness
48 I.D.	5
60 I.D.	6
72 I.D.	7
84 I.D.	8

Cone sections will be made with 5 minimum wall at the bottom and an 8 wall thickness at the top. All base riser sections will be made with the bottom cast monolithically. The minimum thickness of the bottom shall be 6 for all manhole diameters. The manhole diameter to be used shall be as indicated on Drawings.

C. Precast Concrete Manholes and Structures (Stormwater): Precast Structural Concrete as specified in Project Notes. Section 03 41 00.

D. Cast-in-Place Manholes and Structures (Wastewater): Reinforced cast-in-place concrete as specified in Project Notes antimicrobial admixture.

E. Reinforcement: As specified in Project Notes.

2.2 FRAMES, GRATES, RINGS AND COVERS

A. Furnish and install in accordance with Section 33 01 30 - Frames, Grates, Rings and Covers.

2.3 CONFIGURATION

A. Shaft Construction and Concentric or Eccentric (as indicated) Cone Top Section: Reinforced precast or Cast-In-Place Concrete pipe sections, lipped male/female gasketed joints, sleeved to receive pipe.

B. Shape: Cylindrical.

C. Clear Inside Dimensions: 48, 60, or 72-inch diameter as indicated on Drawings.

D. Design Depth: As indicated on Drawings.

E. Clear Cover Opening: 30 inches diameter.

F. Pipe Entry: Furnish openings as indicated on Drawings.

G. Structure Joint Gaskets: ASTM C361; ASTM C990; and Federal Specification No. SS-S-00210; rubber.
   1. Manufacturers:
      a. Ram-Neck.
      b. Kent-Seal No. 2.

2.4 ACCESSORIES

A. Antimicrobial Admixture for Sulfate Resistant Concrete for Wastewater Manholes:

1. An antimicrobial agent, ConmicShield®, or approved equal, shall be used to render the concrete uninhabitable for bacteria growth.
2. The liquid antibacterial admixture shall be an EPA registered material and the registration number shall be submitted for approval prior to use in the project.
3. The amount to be used shall be as recommended by the manufacturer of the antibacterial admixture. This amount shall be included in the total water content of the concrete mix design.
4. The admixture shall be added into the concrete mix water to insure even distribution of the admixture throughout the concrete mixture.
5. ConTint concrete colorant, or approved equal, shall be added at the manufacturer's recommended dosage.
6. Acceptance: acceptance of a product on the basis of a letter of certification to the Engineer stating that the correct amount and correct mixing procedure was followed for all antimicrobial concrete.
7. Product Marking: add the name of the antimicrobial product.

B. Concrete: Specified in Project Notes.

C. Cement: ASTM C150, Type V – sulfate resistant Portland type.

D. Watertight Polyethylene: Heat-shrinkable manhole encapsulation system:
   1. Manufacturers:
      a. WrapidSeal by CCI Pipeline Systems.
      b. Substitutions: Section 01 60 00 - Product Requirements.

2.5 FOUNDATION AND BACKFILL MATERIALS

A. Foundation: Coarse Aggregate Type A2 (Grade No. 3) as specified in Section 32 05 16.

B. Backfill Materials:
   1. Backfill Materials Outside of Traffic Areas: Excavated backfill material outside of traffic areas shall consist of an excavated material of gravel, fine rock cuttings, sandy loam, or clay having dimensions no greater than 2 inches.
   2. Backfill Materials Beneath Pavements:
      a. Coarse Aggregate Type A1 (Flexible Base) per Section 32 11 23 – Flexible Base.
      b. Aggregate Type A3 (Gravel for Trench Backfill) per Section 32 05 16 – Aggregates for Civil Site Improvements.
      c. Flowable Fill per Section 32 23 24 – Flowable Fill.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify items provided by other sections of Work are properly sized and located.

B. Verify built-in items are in proper location, and ready for roughing into Work.

C. Verify correct size of manhole and structure excavation.

3.2 PREPARATION

A. Coordinate placement of inlet and outlet pipe.

B. Do not install manholes and structures where site conditions induce loads exceeding structural capacity of manholes or structures.

C. Inspect precast concrete manholes and structures immediately prior to placement in excavation to verify manholes and structures are internally clean and free from damage. Remove and replace damaged units.

3.3 INSTALLATION - GENERAL

A. Excavation:
   1. Excavate for manholes and structures in accordance with Section 31 23 16 in location and to depth shown. Provide clearance around sidewalls of manhole or structure for construction operations.
   2. When groundwater is encountered, prevent accumulation of water in excavations. Place manholes or structures in dry trench.
   3. Where possibility exists of watertight manhole or structure becoming buoyant in flooded excavation, anchor manhole or structure to avoid flotation.

B. Install manholes and structures supported at proper grade and alignment on Coarse Aggregate Type A2 (Crushed Stone) foundation as shown on Drawings. When indicated on Drawings, install geotextile fabric over subgrade in accordance with manufacturer's instructions.

C. Backfill excavations for manholes and structures in accordance with Section 31 23 17.

D. Form and place manhole or structure cylinder plumb and level, to correct dimensions and elevations.

E. Grout base of manhole to construct invert and achieve slope to exit piping. Trowel smooth. Contour to form continuous drainage channel as indicated on Drawings.

F. Set cover frames and covers level without tipping, to correct elevations.

3.4 PRECAST CONCRETE MANHOLE AND STRUCTURE INSTALLATION

A. Lift precast manholes and structures at lifting points designated by manufacturer.

B. When lowering manholes and structures into excavations and joining pipe to units, take precautions to ensure interior of pipeline and manhole or structure remains clean.

C. Set precast manholes and structures bearing firmly and fully on Coarse Aggregate Type A2 (Crushed Stone). When indicated on Drawings, install geotextile fabric over subgrade in accordance with manufacturer's instructions.

D. Assemble multi-section manholes and structures by lowering each section into excavation. Install rubber gasket joints between precast sections in accordance with manufacturer's

recommendations. Lower, set level, and firmly position base section before placing additional sections.

E. Remove foreign materials from joint surfaces and verify sealing materials are placed properly. Maintain alignment between sections by using guide devices affixed to lower section.

F. Joint sealing materials may be installed on site or at manufacturer's plant.

G. Verify manholes and structures installed satisfy required alignment and grade.

H. Remove knockouts or cut structure to receive piping without creating openings larger than required to receive pipe. Fill annular space with mortar.

I. Cut pipe to finish flush with interior of manhole or structure.

J. Grout base of manhole to construct invert and achieve slope to exit piping. Trowel smooth. Contour to form continuous drainage channel as indicated on Drawings.

3.5 CAST-IN-PLACE CONCRETE MANHOLE AND STRUCTURE INSTALLATION

A. Prepare Coarse Aggregate Type A2 (Crushed Stone) bedding as shown on Drawings to receive foundation slab. When indicated on Drawings, install geotextile fabric over subgrade in accordance with manufacturer's instructions.

B. Erect and brace forms against movement.

C. Install reinforcing steel as indicated on Drawings and in accordance with Project Notes.

D. Place and cure concrete in accordance with Project Notes.

3.6 DOGHOUSE MANHOLE AND STRUCTURE INSTALLATION

A. Stake out location and burial depth of existing sewer line in area of proposed manhole or structure.

B. Carefully excavate around existing sewer line to adequate depth for foundation slab installation. Protect existing pipe from damage. Cut out soft spots and replace with select fill compacted to 95% dry density.

C. Prepare crushed stone bedding as shown on Drawings.

D. Install precast concrete or construct cast-in-place concrete manhole or structure around existing pipe in accordance with the appropriate paragraphs specified herein.

E. Grout pipe entrances.

F. Perform connection to existing pipe at an appropriate time preapproved by Engineer.

G. Block upstream flow at existing manhole or structure with expandable plug.

H. Use hydraulic saw to cut existing pipe at manhole or structure entrance and exit and along pipe length at a point halfway up the outside diameter on each side of the pipe. Bottom half of pipe shall remain as manhole flow channel. Saw cut to have a smooth finish with top half of pipe flush with interior of manhole or structure.

I. Grout base of manhole or structure to achieve slope to manhole or structure channel. Trowel smooth.

3.7 SANITARY MANHOLE DROP CONNECTIONS

A. Construct drop connections into sanitary manholes in accordance with Drawings.

B. Form channel from pipe drop to sweep into main channel at maximum angle of 30 degrees.

3.8 CASTINGS INSTALLATION

A. Set frames using mortar as indicated on Drawings. Install precast concrete grade rings with 1/4 inch thick joints. Lay concrete rings in full bed of mortar and completely fill joints.

B. Unless indicated otherwise, set frame and cover 8 inches above finished grade for manholes and other structures with covers located within unpaved areas to allow area to be graded away from cover beginning 2 inches below top surface of frame.

3.9 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements and 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Test cast-in-place concrete in accordance with Project Notes.

C. Test concrete manhole and structure sections in accordance with ASTM C497.

D. Vertical Adjustment of Existing Manholes and Structures: Conform with Section 33 01 31.
   1. Where required, adjust top elevation of existing manholes and structures to finished grades shown on Drawings.
   2. Reset existing frames, grates and covers, carefully removed, cleaned of mortar fragments, to required elevation in accordance with requirements specified for installation of castings.
   3. Remove concrete without damaging existing vertical reinforcing bars when removal of existing concrete wall is required. Clean vertical bars of concrete and bend into new concrete top slab or splice to required vertical reinforcement, as indicated on Drawings.
   4. Clean and apply sand-cement bonding compound on existing concrete surfaces to receive cast-in-place concrete.

END OF SECTION

SECTION 33 05 17 - PRECAST CONCRETE VALVE VAULTS AND METER BOXES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Precast concrete valve vaults.
   2. Precast concrete meter boxes.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Precast Concrete Valve Vaults:
   1. Basis of Measurement: Per each, of the size indicated.
   2. Basis of Payment: Includes excavation, valve vault, accessories, access hatch, forming and sealing pipe inlets and outlets, tests, compaction, and backfill.

B. Precast Concrete Meter Boxes:
   1. Basis of Measurement: Per each.
   2. Basis of Payment: Includes excavation, meter box, accessories, compaction, and backfill.

1.3 REFERENCES

A. ASTM International:
   1. ASTM A48/A48M - Standard Specification for Gray Iron Castings.
   2. ASTM A185/A185M - Standard Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
   3. ASTM A536 - Standard Specification for Ductile Iron Castings.
   4. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
   5. ASTM C33 - Standard Specification for Concrete Aggregates.
   6. ASTM C150 - Standard Specification for Portland Cement.
   7. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
   8. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
   9. ASTM C478 - Standard Specification for Precast Reinforced Concrete Manhole Sections.
   10. ASTM C497 - Standard Test Methods for Concrete Pipe, Manhole Sections, or Tile.
   11. ASTM C890 - Standard Practice for Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures.
   12. ASTM C913 - Standard Specification for Precast Concrete Water and Wastewater Structures.
   13. ASTM C990 - Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joints Sealants.
   14. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).
   15. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
   16. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

17. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
18. ASTM D4104 - Standard Test Method (Analytical Procedure) for Determining Transmissivity of Nonleaky Confined Aquifers by Overdamped Well Response to Instantaneous Change in Head (Slug Test)

1.4 DESIGN REQUIREMENTS

A. Design Criteria:
1. Watertight precast reinforced air-entrained concrete structures designed to AASHTO HS20-16 kip and ASTM C890 live loading and installation conditions, and manufactured to conform to ASTM C913.
2. Minimum 28-day Compressive Strength: 4,000 psi.
3. Honeycombed or retempered concrete is not permitted.

1.5 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures: Requirements for submittals.

1.6 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Accurately record actual locations and inverts of buried pipe, components and connections.

1.7 DELIVERY, STORAGE AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing and protecting products.

B. Transport and handle precast concrete units with equipment designed to protect units from damage.

C. Do not place concrete units in position to cause overstress, warp or twist.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site.

B. Conduct operations not to interfere with, interrupt, damage, destroy, or endanger integrity of surface or subsurface structures or utilities, and landscape in immediate or adjacent areas.

1.9 COORDINATION – Not Used

PART 2 PRODUCTS

2.1 PRECAST CONCRETE VALVES AND METER BOXES

A. Manufacturers:
   1. Forterra
   2. Oldcastle Precast, Inc.
   3. Substitutions: Section 01 60 00 - Product Requirements.

B. Materials:
   1. Portland Cement: ASTM C150, Type II.
   2. Coarse Aggregates: ASTM C33; Graded 1 inch to No. 4 Sieve.
   3. Sand: ASTM C33; 2.35 fineness modulus.
   4. Water: Potable; clean and free of injurious amounts of acids, alkalis, salts, organic materials, and substances incompatible with concrete or steel.
   5. Air-Entraining Admixtures: ASTM C260.
   6. Reinforcing Steel:
      a. Deformed Bars: ASTM A615/A615M, Grade 60.
      b. Welded Wire Fabric: ASTM A185/A185M.
   7. Joint Sealant:
      a. ASTM C990.

C. Mixes:
   1. Design concrete mix to produce required concrete strength, air-entrainment, watertight properties, and loading requirements.

D. Meter Box Frames and Covers:
   1. Cast Iron Castings: ASTM A48/A48M, Class 30 or better; free of bubbles, sand and air holes, and other imperfections.
   2. Ductile Iron Castings: ASTM A536.
   3. Contact surfaces machined and matched.
   4. Cast cover inscription with pipeline service

E. Access Steps:
   1. As indicated on Drawings.

2.2 BEDDING AND BACKFILL MATERIALS

A. Bedding Material: Fill Type S1, A1, A2, or A3.

B. Backfill Materials: Subsoil Type S1, Select Fill, as specified in Section 31 05 13.

2.3 FABRICATION AND MANUFACTURE

A. Fabricate precast reinforced concrete structures in accordance with ASTM C913, to dimensions indicated on Drawings, and to specified design criteria.

2.4 ACCESS HATCHES

A. Manufacturers:
   1. Halliday Products, Inc.
   2. Substitutions: Section 01 60 00 - Product Requirements.

B. Access Hatch: Aluminum welded construction, size as indicated; single or double door, as indicated.
   1. Cover: Diamond plate aluminum reinforced with structural stiffeners to support required loads.
   2. Frame: Angle type or channel type, as indicated; with integral seat to support cover stiffeners; anchor flange around frame perimeter.
   3. Hinges: Stainless steel.
   4. Lift Handle: Flush drop handle, non-removable type mounted in cover.
   5. Lifting Mechanism: Stainless steel compression springs with automatic hold open and dead stop to retain cover in open position. Cover springs to prevent contact by personnel entering utility structure.
   6. Latch Mechanism: Stainless steel lock with tamper-proof external handle and permanent internal release mechanism.
   7. Hardware: Stainless steel.

2.5 WALL SEAL ASSEMBLIES FOR PIPE PENETRATIONS

A. Manufacturers:
   1. Link-Seal, Model C or L by Pipeline Seal and Insulator, Inc.
   2. Substitutions: Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.1 EXAMINATION – Not Used

3.2 PREPARATION

A. Ream pipe ends and remove burrs.

B. Remove scale and dirt from components before assembly.

C. Establish invert elevations for each component in system.

D. Hand trim excavation to suit valve vaults and meter boxes. Remove stones, roots or other obstructions.

3.3 VAULT BEDDING AND BACKFILL

A. Excavate in accordance with Section 31 23 16 - Excavation for work of this Section. Hand trim excavation for accurate placement of vaults and meter boxes to elevations indicated.

B. Place bedding material level in one continuous layer not exceeding 6 inches compacted depth, compact to 95 percent Standard Proctor Density.

C. Backfill around sides of vaults and meter boxes, tamped in place and compacted to 95 percent Standard Proctor Density.

D. Maintain optimum moisture content of bedding material to attain required compaction density.

E. Install vaults and meter boxes and related components on bedding.

F. Request inspection by Engineer prior to placing trench backfill over piping.

G. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

3.4 CONNECTING PIPING

A. Connect piping.

3.5 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.

3.6 PROTECTION OF FINISHED WORK

A. Section 01 70 00 - Execution and Closeout Requirements: Protecting finished work.

END OF SECTION

SECTION 33 11 13 - PUBLIC WATER UTILITY DISTRIBUTION PIPING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Water piping.
2. Tapping Sleeves and Valves.
3. Valves and Fire Hydrants.
4. Turbine Water Meters.
5. Underground pipe markers.
6. Precast concrete valve vaults and meter boxes.
7. Concrete encasement and cradles.
8. Bedding, embedment, and backfill materials.
9. Accessories.

1.2 PRICE AND PAYMENT PROCEDURES

A. Section 01 20 00 - Price and Payment Procedures Contract Sum/Price.

B. Pipe and Fittings:
1. Basis of Measurement: Pipe will be measured by the linear foot along the centerline of the pipe for the various sizes and classes of pipe in place, in accordance with these specifications, complete and accepted by the Engineer, including excavation, embedment, and backfill, unless they are included in the bid as a pay item. Where branches or connections to existing pipe lines are involved, measurement of the new connecting pipe will be made from the intersection of its central axis with the outside surfaces of the pipe into which it connects. Where structures are included in lines of pipe, that length of pipe tying into the structure wall will be included for measurement but no other portion of the structure length or width will be so included.
2. Basis of Payment: Payment for pipe, measured as prescribed above, will be made at the unit price bid per linear foot for the various sizes of pipe, of the materials and class indicated. Payment shall be full compensation in accordance with pay items set in the bid, for excavation, furnishing, hauling and placing pipe including fittings, lugs, and all incidental and subsidiary materials and work; preparing, shaping, dewatering and shoring of trenches; hauling, placing and preparing bedding; for connecting to new or existing systems or structures; for hauling, moving, placing and compacting backfill materials and for all other incidentals necessary to complete the pipe installation as indicated.

C. Meters:
1. Basis of Measurement: Per each.
2. Basis of Payment: Includes meter, fittings and accessories.

D. Wet Connections to Water Mains:
1. Basis of Measurement: Per each.
2. Basis of Payment: Wet connections shall be paid for at the unit price bid per each, complete in place, according to the size of the main that is in service and shall be full

compensation for all work required to make the connection and place the pipe in service. All fittings necessary for the wet connection shall be incidental, unless noted otherwise.

1.3 REFERENCE STANDARDS

A. American Association of State Highway and Transportation Officials:
   1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.

B. American Society of Mechanical Engineers:
   1. ASME B16.1 - Cast Iron Pipe Flanges and Flanged Fittings.

C. ASTM International:
   1. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
   2. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
   3. ASTM A193 – Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature and High Pressure Service.
   4. ASTM A194 – Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service.
   5. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
   6. ASTM A325 – Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 KSI Minimum Tensile Strength.
   7. ASTM F593 – Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
   8. ASTM A594 – Standard Specification for Stainless Steel Nuts.
   9. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).
   10. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
   11. ASTM D1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
   12. ASTM D2241 - Standard Specification for Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter.
   13. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
   14. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
   15. ASTM D3139 - Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.
   16. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

D. American Water Works Association:
   1. AWWA C104 - ANSI Standard for Cement Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
   2. AWWA C105 - ANSI Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems.

3. AWWA C110 - ANSI Standard for Ductile-Iron and Gray-Iron Fittings, 3 In. Through 48 In. (76 mm through 1,219 mm), for Water.
4. AWWA C111 - ANSI Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
5. AWWA C115 - ANSI Standard for Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
6. AWWA C151 - ANSI Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water or Other Liquids.
7. AWWA C153 - ANSI Standard for Ductile-Iron Compact Fittings for Water Service.
8. AWWA C200 - Steel Water Pipe 6 In. (150 mm) and Larger.
9. AWWA C203 - Coal-Tar Protective Coatings and Linings for Steel Water Pipelines - Enamel and Tape - Hot Applied.
10. AWWA C205 - Cement-Mortar Protective Lining and Coating for Steel Water Pipe - 4 In. and Larger - Shop Applied.
11. AWWA C206 - Field Welding of Steel Water Pipe.
12. AWWA C207 - Steel Pipe Flanges for Waterworks Service - Sizes 4 In. Through 144 In. (100 mm through 3,600 mm).
13. AWWA C208 - Dimensions for Fabricated Steel Water Pipe Fittings.
14. AWWA C213 - Fusion-Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines.
15. AWWA C500 - Gate Valves for Water and Sewage Systems.
16. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.
17. AWWA C605 - Water Treatment - Underground Installation of Polyvinyl Chloride PVC Pressure Pipe and Fittings for Water.
18. AWWA C606 - Grooved and Shouldered Joints.
19. AWWA C700 - Cold-Water Meters - Displacement Type, Bronze Main Case.
20. AWWA C701 - Cold-Water Meters - Turbine Type, for Customer Service.
21. AWWA C702 - Cold-Water Meters - Compound Type.
22. AWWA C706 - Direct-Reading, Remote-Registration Systems for Cold-Water Meters.
23. AWWA C900 - Polyvinyl Chloride (PVC) Pressure Pipe, and Fabricated Fittings, 4 In. through 12 In. (100 mm through 300 mm), for Water Distribution.
24. AWWA C905 - Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14 In. Through 36 In. (350 mm Through 1,200 mm), for Water Transmission and Distribution.
25. AWWA M6 - Water Meters - Selection, Installation, Testing, and Maintenance.
26. AWWA M11 - Steel Water Pipe; A Guide for Design and Installation.

E. Manufacturer's Standardization Society of the Valve and Fittings Industry:
1. MSS SP-60 - Connecting Flange Joint between Tapping Sleeves and Tapping Valves.

F. National Fire Protection Agency:
1. NFPA 24 - Standard for the Installation of Private Fire Service Mains and Their Appurtenances.

1.4 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures: Requirements for submittals.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Record actual locations of piping mains, valves, connections, thrust restraints, and invert elevations.

C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.6 QUALITY ASSURANCE

A. Valves: Mark valve body with manufacturer's name and pressure rating.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Deliver and store valves in shipping containers with labeling in place.

C. Block individual and stockpiled pipe lengths to prevent moving.

D. Do not place pipe or pipe materials on private property or in areas obstructing pedestrian or vehicle traffic.

E. Store polyethylene materials out of sunlight.

1.8 EXISTING CONDITIONS

A. Verify field measurements prior to fabrication. Indicate field measurements on shop drawings.

PART 2 PRODUCTS

2.1 WATER PIPING

A. Ductile Iron Pipe: AWWA C150 and C151 of the class indicated. Asphaltic outside coating: AWWA C151. Cement-Mortar Lining: AWWA C104, double thickness cement-mortar lining with asphaltic seal coat. Polyethylene Encasement: AWWA C105.
   1. Pipe Class: As indicated on the Drawings and conforming to AWWA C151, for nominal thickness, rated water working pressure and maximum depth of cover.
   2. Fittings: Ductile iron, AWWA C110, Class 350; or compact fittings AWWA C153, Class 350.
      a. Coating and Lining:
         1) Asphaltic Coating: AWWA C110.
         2) Cement-Mortar Lining: AWWA C104 and C111, double thickness cement and seal coated.
   3. Joints:
      a. Mechanical and Push-On Joints: AWWA C111.
         1) Wedge Action Restraining Gland for Ductile Iron Mechanical Joints.
            a) Materials:
               (1) Gland body, wedge segment, and actuating bolts per ASTM A536 64-45-12 ductile iron.

(2) Wedge Segments: heat treated to a minimum hardness of 370 BHN.
(3) Tee-head Bolts and Nuts: Corrosion-resistant Stainless Steel, AISI 316; ASTM F593 (cold worked) bolts with ASTM F594 heavy hex nuts coated with FlouroKote #1 by Metal Coatings Corp.

b) Approved manufacturers for DIP Mechanical Joint Restraints:
(1) EBAA Iron Sales Inc.: Series 1100 MEGALUG.
(2) SIGMA Corporation: ONE-LOK Series D-SLDE.
(3) Romac Industries, Inc.: RomaGrip.
(4) Tyler Union: TUFGrip.

c) Approved manufacturers for PVC Pipe Mechanical Joint Restraints:
(1) EBAA Iron Sales, Inc.: Series 2000PV for 3-inch through 36-inch diameters and Series 2200 for 36-inch through 48-inch diameters.
(2) SIGMA Corporation: ONE-LOK Series D-SLCE.
(3) Romac Industries, Inc.: PVC RomaGrip.
(4) Tyler Union: TUFGRIP.

2) Gaskets: AWWA C111.

b. Flanged Joints: AWWA C111 and C115.
1) Bolts: ASTM A193, Grade B8M, Class 2 Stainless Steel, AISI 316.
2) Nuts: ASTM A194, Grade 8M, Stainless Steel, AISI 316; cold punched, hexagonal, trimmed and chamfered. Nuts shall be coated with FlouroKote #1 by Metal Coatings Corp. to prevent galling.
3) Insulating Sleeves and Washers: One-piece integral sleeves and washers manufactured of high-density polyethylene, NEMA grade LE phenolic, or Mylar, by Advance Products and Systems, Inc., or equal.
4) Gaskets: Full faced, 1/8-inch minimum thickness SBR (Styrene Butadiene) elastomer per ANSI/AWWA C111, A21.11. Flange gaskets shall be the high-performance type rated for a water working pressure of 350 psi for 4-inch through 24-inch diameters; 250 psi for 30-inch through 48-inch diameters; and 150 psi for 54-inch through 64-inch diameters.
a) Approved Manufacturers: U.S. Pipe and Foundry Co.: Full Face Flange-Tyte, or equal.

c. Restrained Joints:
1) Push-on Pipe Joint Restraint: Section 33 05 19 – Pressure Piping Tied Joint Restraint System.
2) Proprietary Restrained, Integral, Boltless, Flexible, Push-on Joint Pipe and Fittings: Restrained joint pipe, fittings, and restraining components shall be Ductile Iron in accordance with these Specifications. The restrained joint shall be manufactured integrally with the pipe and shall have a working pressure rating equivalent to the working pressure of the parent pipe. The restrained joint pipe and fittings shall utilize a conventional gasket for Mechanical and Push-on Joints.
a) Approved Manufacturers:
(1) U.S. Pipe and Foundry Co.: TR FLEX for 4-inch through 36-inch pipe diameters.
(2) Griffin Pipe Products Co.: SNAP-LOK for 6-inch through 48-inch pipe diameters.
(3) American Cast Iron Pipe Co.: Flex-Ring for 4-inch through 48-inch pipe diameters and Lok-Ring for 54-inch through 64-inch pipe diameters.

(4) Clow Water Systems Company: TR FLEX for 4-inch through 36-inch pipe diameters.

b) Thrust blocking is not required on proprietary restrained, integral, boltless, flexible, push-on joint pipe and fittings, unless specified otherwise.

4. Thrust-Blocking: As indicated on the Drawings.
5. Jackets: All ductile iron water pipe and fittings shall be double wrapped with 8 mil (minimum) polyethylene film meeting AWWA C105, with all edges and laps taped (with polyethylene tape) securely to provide a continuous wrap to prevent contact between the pipe and the surrounding backfill and bedding material. Repair rips, punctures, or other damage to the polyethylene wrap with polyethylene tape.
6. Ductile Iron Pipe Installed Above Grade or in Below Ground Concrete Vaults:
   a. Flanged Ductile Iron Pipe: AWWA C115 and as per Ductile Iron Pipe, above, with the following exception:
      1) Pipe and fittings exposed to view in the finished work are to be painted in accordance with the specifications. Pipe shall not receive the standard bituminous coating on the outside surfaces but shall be shop primed on the outside with one coat of Kop-Coat No. 621 Rust Inhibitive Primer or equal.

B. Polyvinyl Chloride (PVC) Water Pipe: All polyvinyl chloride (PVC) water pipe shall be of the rigid (UNPLASTICIZED) type and must bear the National Sanitation Foundation seal of approval for potable water pipe. Each joint of pipe shall consist of single continuous extrusion; bells or other components attached by solvent welding are not acceptable. Pipe in sizes 4 inches through 12 inches in diameter shall conform to the applicable requirement of AWWA C900 and shall be pressure rated at 305 psi (DR 14), 235 psi (DR 18), or 165 psi (DR 25) as indicated. Pipe in sizes of 14 inches through 48 inches in diameter shall conform to AWWA C905 and shall be pressure rated at 165 psi (DR 25), 200 psi (DR 21), 235 psi (DR 18), or 305 psi (DR 14), as indicated.
   1. Fittings: Fittings shall be ductile iron and shall conform to the requirements of AWWA C110, Class 350, or compact fittings AWWA C153, Class 350. Fittings shall be mechanical restrained joints and conform to the ductile iron pipe specifications outlined herein.
   2. Joints:
      a. Push-on Joints: AWWA C111. Pipe shall have push-on, rubber gasket joints of the bell and spigot type with thickened integral bells manufactured on the pipe. The wall thickness of each pipe bell and joint coupling must be greater than the standard pipe barrel thickness. Clearance must be provided in every gasket joint for both lateral pipe deflection and for linear expansion and contraction. The sealing ring groove in the coupling shall be of the same design as the groove in cast iron fittings. Solvent welding of PVC water pipe shall not be allowed.
      b. Restrained Joints:
         1) Mechanical Joints: AWWA C111 and per Paragraph 2.1(A)(3) as specified above.
         2) Push-on Pipe Tied Bell Joint: Section 33 05 19 – Pressure Piping Tied Joint Restraint System.

C. Steel Pipe: AWWA C200 Fabricated Pipe, minimum wall thickness 0.375 inches for pipe diameters up to 8 inches; 0.50 inches for pipe diameters greater than 8 inches. Internal design pressure shall be as indicated on Drawings.
   1. Fittings and Special Sections: AWWA C208.
   2. Flanges: AWWA C207 Class E or F as indicated on Drawings.

3. Field Welding Materials:
   a. Pipe: AWWA C206.
   b. Joints: AWWA C205.
4. Interior Cement Mortar Lining: AWWA C205. Cement for mortar lining shall conform to ASTM C150 and shall by Type II. No fly ash allowed.
5. Buried Steel Pipe Exterior Lining:
   a. AWWA C205, reinforced cement-mortar coating. Reinforcement shall be steel wire of a minimum size of WO.5 (ASTM A82) or WO.5 x WO.5 welded wire fabric (ASTM A185 or ASTM A497). Cement for mortar coating shall conform to ASTM C150 and shall be Type II. No fly ash allowed.
6. Exterior Coating of Exposed Piping: AWWA C213, fusion-bonded epoxy coating.
7. Bolts and Nuts:
   a. Bolts: ASTM A193, Grade B8M, Class 2 Stainless Steel, AISI 316.
   b. Nuts: ASTM A194, Grade 8M, Stainless Steel, AISI 316. Washers: Stainless Steel (SS 316). All nuts shall be coated with FlouroKote #1 by Metal Coatings Corp. to prevent galling.

D. High Density Polyethylene Pipe (HDPE): Furnish solid wall pipe with plain end construction for heat joining (butt fusion) conforming to ASTM F2620. Utilize controlled temperatures and pressures for joining to produce fused leak-free joint.
   1. Material: PE4710 (PE3408).
   2. Dimension Ratio: DR 17.
   3. Manufacturer's:
      a. Chevron Phillips Chemical Company, LP.
      b. JM Manufacturing Company, Inc. (JM Eagle)
      c. Georg Fischer-Central Plastics, LLC.
   4. Fittings:
      a. Fittings shall be ductile iron and shall conform to the requirements of AWWA C110, Class 350, or compact fittings AWWA C153, Class 350. Fittings shall be mechanical restrained joints and conform to the ductile iron pipe specifications outlined herein.
      b. Provide ductile iron backer ring behind HDPE flanges.
      c. Bends 11¼°. ANSI/AWWA C906; material designation (ASTM D3350) PE 3408, and a Pressure Class 250 of the appropriate size and class for the pipe/material it is being connected to.
   5. Joints: ASTM D3261 thermal butt fusion joints.
   6. Make curves by deflecting pipe, by use of beveled pipe ends, or by combination of two methods, unless otherwise indicated on Drawings. Do not exceed manufacturers recommended deflections. Provide bends for deflections greater than 5 degrees, unless otherwise recommended by manufacturer and approved by Engineer.

2.2 TAPPING SLEEVES AND VALVES

A. Tapping Sleeves:
   1. <u>Manufacturers</u>:
      a. Ford Meter Box Co., Inc.: Style FAST Tapping Sleeve.
      b. PowerSeal Corporation: Model 3480.
      c. Romac Industries, Inc.: Model SST
   2. Substitutions: Section 01 60 00 – Product Requirements.

3. Description: The tapping sleeve shall be made completely of stainless steel. The tapping sleeve shall have a flange face gasket, branch sealing gasket, and complete circle gasket all permanently attached to the sleeve from the factory. All welding shall be passivated so as to return the welded stainless steel to its original corrosion resistant state. There shall be no paper or plastic adhesive labels attached to the sleeve, any information appearing on the sleeve shall be stenciled. The tapping sleeve shall be rated for a minimum working pressure of 150 psi. Test plug is required.
4. Material Specifications: The shell shall be 18-8 Type 304 stainless steel or equal. The flange shall be 18-8 Type 304 stainless steel. Carbon steel flanges are not acceptable. The flange shall conform to AWWA C207 Class D ANSI 150 drilling. The armor plate shall be 18-8 Type 304 stainless steel, bonded to the complete circle gasket. The bolts and nuts shall be 18-8 Type 304 stainless steel 5/8 NC threads. Either shall be coated to prevent galling or seizing. The gaskets shall be of virgin Buna-N or equal, compounded for water service.

B. Tapping Valves:
1. Manufacturers:
   a. Mueller Co.
   b. U.S. Pipe Valve & Hydrant Division.
2. Substitutions: Section 01 60 00 – Product Requirements.
3. Description: AWWA C509, ductile iron body, resilient-seated gate valve with non-rising stem. Flanged ends shall conform to AWWA C110. Mechanical joint ends shall conform to AWWA C111. Minimum working pressure shall be 200 psi.

2.3 VALVES AND FIRE HYDRANTS

A. Valves: Conform to Section 33 12 16.

2.4 TURBINE WATER METERS

A. Manufacturer and Model:
1. Sensus: OMNI T^2 – 8

B. Substitutions: Section 01 60 00 – Product Requirements.

C. Description: AWWA C701 Class II, turbine meter assembly meeting NSF/ANSI Standard 61, Annex F and G.

D. Meter: Brass body turbine meter with magnetic drive register.
1. Service: Cold water, 122 degrees F.
2. Nominal Flow: 160 gpm.
3. Pressure Drop at Nominal Flow: 6.9 psi.
4. Maximum Flow: 200 gpm.
5. Maximum Operating Pressure: 200 psi.
6. Accuracy: 1-1/2 percent.
7. Maximum Counter Reading: 100 million gallons.

2.5 AIR RELEASE VALVES – Not Used

2.6 COMBINATION AIR VALVES (AIR RELEASE AND AIR/VACUUM VALVES) – Not Used

2.7 UNDERGROUND PIPE MARKERS

A. Pipe shall be identified in conformance with ANSI/AWWA C900 or C905 as appropriate.

B. Description: Plastic Ribbon Tape: Bright colored, continuously printed, minimum 6 inches wide by 4 mil thick, manufactured for direct burial service.

2.8 PRECAST CONCRETE VALVE VAULTS AND METER BOXES

A. Precast Concrete Valve Vaults and Meter Boxes: Conform to Section 33 05 17.

2.9 PIPE SUPPORTS AND ANCHORING

A. Metal for pipe support brackets: Structural steel, galvanized and thoroughly coated with bituminous paint.

B. Tie rods and clamps or lugs: Stainless steel, AISI Type 304.

2.10 CONCRETE ENCASEMENT AND CRADLES

A. Concrete: 2500 psi 28 day concrete, air entrained rough troweled finish.

2.11 BEDDING, EMBEDMENT, AND BACKFILL MATERIALS

A. Bedding Material: As specified in Section 31 23 17.

B. Embedment Material: as specified in Section 31 23 17.

C. Backfill Material: as specified in Section 31 23 17.

2.12 ACCESSORIES

A. Concrete for Thrust Restraints: Conform to Project Notes.

B. Manhole and Cover: Conform to Section 33 05 14.

C. Protective Coating: Bituminous paint.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for installation examination.

B. Verify that the existing utility water main size, location, and invert are as indicated on Drawings.

3.2 PREPARATION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for installation preparation.

B. Pre-Construction Site Photos:
   1. Take photographs along centerline of proposed pipe trench; minimum one photograph for each 50 feet of pipe trench.
   2. Show mail boxes, curbing, lawns, driveways, signs, culverts, and other existing site features.
   3. Include project description, date taken, and sequential number on back of each photograph.

C. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, remove burrs. Use only equipment specifically designed for pipe cutting. The use of chisels or hand saws will not be permitted. Grind edges smooth with beveled end for push-on connections.

D. Remove scale and dirt on inside and outside before assembly.

E. Prepare pipe connections to equipment with flanges or unions.

3.3 BEDDING

A. Excavate pipe trench in accordance with Section 31 23 17 for Work of this Section. Hand trim excavation for accurate placement of pipe to elevations indicated on Drawings.

B. Dewater excavations to maintain dry conditions and preserve final grades at bottom of excavation.

C. Provide sheeting and shoring in accordance with Sections 31 23 15 and 31 23 17.

D. Bedding shall be required to bring the trench bottom up to grade and shall be the same material as the embedment. The bedding shall be contoured at each belled joint to permit proper joint assembly while maintaining uniform pipe support.

E. Place bedding to a compacted depth as indicated on the Drawings and in accordance with Section 31 23 17.

F. Maintain optimum moisture content of bedding material to attain the required compaction density.

3.4 INSTALLATION - PIPE

A. Install pipe in accordance with AWWA C600 and/or AWWA C605, whichever is applicable.

B. Handle and assemble pipe in accordance with manufacturer’s instructions and as indicated on Drawings.

C. Joint Deflection: Deflection at the joint shall not exceed 1.5 degrees or 75% of the maximum deflection recommended by the manufacturer, whichever is less.

D. Maintain 9 ft horizontal separation of water main from sanitary sewer piping in accordance with TCEQ Chapter 290.

E. Install all buried piping to the lines and grades as shown on the Drawings. All underground piping shall slope uniformly between joints where elevations are shown.

F. Install ductile iron piping and fittings to AWWA C600.

G. Route pipe in straight line. Relay pipe that is out of alignment or grade.

H. Install pipe with no high points. If unforeseen field conditions arise which necessitate high points, install air release valves as directed by Engineer.

I. Install pipe to have bearing along entire length of pipe. Excavate bell holes to permit proper joint installation. Do not lay pipe in wet or frozen trench.

J. Prevent newly installed waterline from becoming contaminated with groundwater. If contamination occurs, the entire length of pipe affected shall be thoroughly cleaned prior to installing additional pipe.

K. Install pipe to allow for expansion and contraction without stressing pipe or joints.

L. Sanitary precautions shall be taken during waterline installation in accordance with AWWA standards. Precautions include keeping pipe clean and capping or otherwise effectively covering open pipe ends to exclude insects, animals, foreign material, debris, or other sources of contamination from unfinished pipe lines at times when construction is not in progress.

M. Close pipe openings with watertight plugs during work stoppages and at the conclusion of each day's work. Trenches shall not be left open overnight. After installation of the temporary night cap, the trench shall be backfilled to provide blocking to keep the night cap in place and prevent floatation of the pipe in the event of rainfall events or excessive groundwater. Backfill of the excavation will not be required to meet the density requirements for trench backfill. Contractor shall provide a submittal for the night cap fitting for approval by Engineer.

N. Install access fittings to permit disinfection of water system performed under Section 33 13 00.

O. Establish elevations of buried piping with not less than 3.5 ft of cover for pipes less than 12 inches in diameter. Measure depth of cover from final surface grade to top of pipe barrel.

P. Shore up and protect from damage all existing underground water lines and power lines, and all existing structures.

Q. Do not lay pipe on unstable material, in wet trench, or when trench or weather conditions are unsuitable.

R. Do not lay pipe in same trench with other pipes or utilities unless shown otherwise on Drawings.

S. Hold pipe securely in place while joint is being made.

T. Do not walk on pipes in trenches until covered by embedment and tamped in place over pipe.

U. Full length of each section of pipe shall rest solidly upon pipe bed with recesses excavated to accommodate bells or joints. Do not lay pipes on wood blocking.

V. Tees, plugs, caps, bends and hydrants on pipe installed underground shall be restrained and anchored.

W. Tightly cover and protect equipment. At completion of all work, thoroughly clean equipment.

X. Install plastic ribbon tape continuous over top of pipe buried 24 inches below finish grade above pipe line; coordinate with Section 31 23 17. Tape shall be continuous and shall not deviate outside the horizontal profile of the pipe.

Y. Stamp a W in curb face at all service locations on new construction.

3.5 INSTALLATION – HDPE PIPE

A. Install pipe in accordance with the manufacturer's recommended installation procedures and ASTM D2774. Do not install with less than 3 feet of cover.

B. Do not store pipe uncovered in direct sunlight. Allow pipe temperature to approach ground temperature before each individual pipe section is terminally connected.

C. Joints: Join sections of HDPE pipe into continuous lengths above ground by thermal butt fusion method in accordance with AWWA C906 and pipe manufacturer's recommendations for the specified service. Fusion Joints: meeting minimum requirements of manufacturer for cool down time and other fusing requirements. Socket fusion and extrusion welding or hot gas welding will not be accepted.

D. Cutting pipe: Comply with pipe manufacturer's recommendations. After cutting, leave end of pipe in accordance with manufacturer's recommendations.

E. Restrained Joints: Designed by manufacturer and approved by Engineer. Restrain sufficient distance from each side of bend, tee, plug, or other fitting to resist thrust developed at design pressure for pipe. Design pressure: 250 psi. When assembled outside of trench, allow pipe to cool in trench before backfilling.

F. Connections:
   1. Make connections between new work and existing piping using suitable fittings. Make each connection with existing pipe at a time and under conditions which will least interfere with service to customers, and as authorized by Engineer.
   2. Connect to steel, ductile iron and prestressed concrete cylinder pipe as recommended by pipe manufacturer and detailed on Drawings.

3. Support connections to valves and fittings separately from pipe on concrete pads as approved by Engineer.

3.6 INSTALLATION - VALVES AND HYDRANTS

A. Install valves in accordance with Section 33 12 16.

B. Install hydrants in accordance with Section 33 12 19.

3.7 INSTALLATION - TAPPING SLEEVES AND VALVES

A. Install tapping sleeves and valves in accordance with Drawings and in accordance with manufacturer's instructions.

3.8 POLYETHYLENE ENCASEMENT

A. Encase ductile iron piping and fittings in polyethylene wrap to prevent contact with surrounding backfill material.

B. Install in accordance with AWWA C105.

C. Terminate polyethylene encasement 3 to 6 inches above ground where pipe is exposed.

3.9 INSTALLATION - METERS

A. Install turbine meters in accordance with AWWA M6, with isolating valves on the inlet and outlet. Install bypass with gate valve as indicated on the Drawings.

3.10 INSTALLATION - STUB OUTS

A. All stub outs and their fittings for future water main and lateral extensions shall be mechanically restrained with Wedge Action Restraining Glands or Tied Joint Restraint Systems in accordance with Specification Section 33 05 19 - Pressure Piping Tied Joint Restraint System.

3.11 THRUST RESTRAINT

A. Provide valves, tees, bends, caps, and plugs with concrete thrust blocks. Pour concrete thrust blocks against undisturbed earth. Locate thrust blocks at each elbow or change of pipe direction to resist resultant force and so pipe and fitting joints will be accessible for repair. Provide thrust restraint bearing on subsoil in accordance with the Drawings.

B. Install tie rods, clamps, set screw retainer glands, or restrained joints prior to the installation of the concrete thrust blocking.

C. Install thrust blocks, tie rods, and joint restraint at dead ends of water main.

3.12 SERVICE CONNECTIONS

A. Install service connections in accordance with Section 33 12 13.

3.13 EMBEDMENT

A. Place embedment beneath the haunches of the pipe, around sides of the pipe, and above the top of pipe in accordance with Section 31 23 17.

B. Maintain optimum moisture content of bedding material to attain required compaction density.

3.14 DISINFECTION OF POTABLE WATER PIPING SYSTEM

A. Flush and disinfect system in accordance with Section 33 13 00.

3.15 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Requirements for inspecting, testing.

B. Section 01 70 00 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.

C. Pressure and leakage test system in accordance with AWWA C600 and the following:
   1. Test Pressure: Not less than 200 psi or 133% of the nominal pipe pressure class indicated, whichever is greater.
   2. Conduct hydrostatic test for at least four-hour duration. Contractor shall furnish all pumps, gauges, and equipment necessary for the tests. The Engineer must be present to observe the tests.
   3. Test pressure shall not vary by more than ±5 psi (24.5 kPa) for the duration of the test.
   4. Fill section to be tested with water slowly. Before applying the specified test pressure, air shall be expelled completely from the section of piping under test. If permanent air vents are not located at all high points, corporation cocks shall be installed at such points so that the air can be expelled as the line is filled with water. After all the air has been expelled, the corporation cocks and air vents shall be closed and the test pressure applied. At the conclusion of the pressure test, the corporation cocks shall be removed and plugged or left in place as required by the specifications.
   5. All exposed pipe, fittings, valves, hydrants, and joints shall be examined carefully during the test. Any damage or defective pipe, fittings, valves, hydrants, or joints that are discovered following the pressure test shall be replaced with new material, and the test shall be repeated until satisfactory results are obtained.
   6. Correct all observed deficiencies and continue testing at same test pressure for additional 2 hours to determine leakage rate. Maintain pressure within plus or minus 5.0 psig of test pressure. Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe or any valved section thereof to maintain pressure within 5 psi of the specified test pressure after the pipe has been filled with water and the air has been expelled. Leakage shall not be measured by a drop in pressure in a test section over a period of time.
   7. Compute maximum allowable leakage by the following formula:

L = ($SD\sqrt{P}$)/C
L = allowable leakage, in gallons per hour
S = length of pipe tested, in feet
D = nominal diameter of pipe, in inches
P = average test pressure during hydrostatic test, in psig
C = 148,000
When pipe under test contains sections of various diameters, calculate allowable leakage from sum of computed leakage for each size.

8. When test of pipe indicates leakage greater than allowed, locate source of leakage, make corrections and retest until leakage is within allowable limits. Correct visible leaks regardless of quantity of leakage.

9. No pipe installation will be accepted if the leakage is greater than the allowable determined by the formula prescribed above. If any test of laid pipe discloses leakage greater than that specified in (7), above, repairs or replacements shall be accomplished in accordance with the specifications.

10. All visible leaks are to be repaired regardless of the amount of leakage.

D. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

END OF SECTION

SECTION 33 12 00 - WATER UTILITY DISTRIBUTION EQUIPMENT

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Reduced pressure backflow preventer assemblies.
2. Double check valve backflow preventer assemblies.
3. Valve vaults.
4. Buried piping within 5 feet of valve vault.
5. Interior piping.
6. Valves.
7. Pipe supports.
8. Embedment and backfill materials.

1.2 REFERENCE STANDARDS

A. American Society of Mechanical Engineers:
1. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
2. ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
3. ASME B31.9 - Building Services Piping.

B. American Society of Sanitary Engineering:
1. ASSE 1013 - Reduced Pressure Principle Backflow Preventers.
2. ASSE 1015 - Double Check Backflow Prevention Assemblies and Double Check Fire Protection Backflow Prevention Assemblies.
3. ASSE 1047 - Reduced Pressure Detector Fire Protection Backflow Prevention Assemblies.
4. ASSE 1048 - Double Check Detector Fire Protection Backflow Prevention Assemblies.

C. ASTM International:
   1. ASTM B88 - Standard Specification for Seamless Copper Water Tube.
   2. ASTM D1785 -.Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
   3. ASTM D2241 - Standard Specification for Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter.
   4. ASTM D2466 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
   5. ASTM D2855 - Standard Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.
   6. ASTM D3035 - Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter.
   7. ASTM D3139 - Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.

D. American Water Works Association:
   1. AWWA C104 - American National Standard for Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
   2. AWWA C111 - American National Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
   3. AWWA C151 - American National Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water.
   4. AWWA C500 - Metal-Seated Gate Valves for Water Supply Service.
   5. AWWA C509 - Resilient-Seated Gate Valves for Water-Supply Service.
   6. AWWA C510 - Double Check Valve Backflow Prevention Assembly.
   7. AWWA C511 - Reduced-Pressure Principle Backflow Prevention Assembly.
   8. AWWA C900 - Polyvinyl Chloride (PVC) Pressure Pipe, 4 in. through 12 in., for Water Distribution.
   9. AWWA C901 - Polyethylene (PE) Pressure Pipe and Tubing, 1/2 in. through 3 in., for Water Service.

E. American Welding Society:
   1. AWS A5.8 - Specification for Filler Metals for Brazing and Braze Welding.

F. Manufacturers Standardization Society of the Valve and Fittings Industry:
   1. MSS SP 89 - Pipe Hangers and Supports - Fabrication and Installation Practices.

1.3 PRE-INSTALLATION MEETINGS – Not Used

1.4 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures: Requirements for submittals.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Record actual locations of backflow preventer assemblies.

C. Operation and Maintenance Data: Submit spare parts list, exploded assembly views, and recommended maintenance intervals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for maintenance materials.

B. Extra Stock Materials:
   1. Furnish two sets of seals for each backflow preventer assembly.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum ten years documented experience.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Accept backflow preventer assemblies, valves, and equipment on site in shipping containers with labeling in place. Inspect for damage.

C. Furnish cast iron and steel valves with temporary protective coating.

D. Furnish pipe and fittings with temporary end caps and closures. Maintain caps and closure in place until installation.

E. Protect backflow preventer assemblies from entry of foreign materials by temporary covers.
   1. Protect openings in sections of completed piping systems.
   2. Protect openings in piping systems when Work is not in progress.

1.9 EXISTING CONDITIONS

A. Verify field measurements prior to fabrication. Indicate field measurements on shop drawings

1.10 WARRANTY

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for warranties.

B. Furnish five year manufacturer’s warranty for backflow preventer assemblies.

PART 2 PRODUCTS

2.1 BACKFLOW PREVENTERS

A. Manufacturers:
   1. Wilkins

2. Watts Water Technologies, Inc.

B. Reduced Pressure Backflow Preventers with Detector Assembly: Not Used

C. Reduced Pressure Backflow Preventers with Detector Assembly:
1. Size: 3 inches to 10 inches.
2. Comply with ASSE 1047 and AWWA C511.
3. Heavy duty cast iron construction with fusion epoxy coat inside and outside.
4. Two independently operating, spring loaded check valves.
5. Diaphragm type differential pressure relief valve located between check valves.
6. Third check valve opening under back pressure in case of diaphragm failure.
7. Furnish with two resilient seated gate valves, strainer, and four resilient seated, ball valve test cocks.

D. Double Check Valve Backflow Preventer with Detector Assembly:
1. Size: 1/2 inch to 2 1/2 inches.
2. Comply with ASSE 1048 and AWWA C510.
3. Bronze body with corrosion resistant internal parts.
4. Stainless steel springs.
5. Two independently operating check valves with intermediate atmospheric vent.
6. Furnish with two quarter-turn, full port resilient seated, bronze ball valves, strainer, and test cocks.

E. Double Check Valve Backflow Preventer with Detector Assembly: Not Used

2.2 VALVE VAULT

A. Valve Vault: Precast concrete, as specified in Section 33 05 17.

2.3 PIPING

A. Refer to Section 33 11 13 – Public Water Utility Distribution Piping

2.4 PIPE SUPPORTS

A. Manufacturers:
1. Anvil International.
2. Substitutions: Section 01 60 00 - Product Requirements.

B. Floor Support for Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.

C. Copper Pipe Support: Carbon steel ring, adjustable, copper plate.

2.5 EMBEDMENT AND BACKFILL MATERIALS

A. Embedment: Fill Type A4, as specified in Section 31 23 17.

B. Backfill: Fill Type A4, as specified in Section 31 23 17.

2.6 FLANGES, UNIONS, AND COUPLINGS

A. Pipe Size 3 inches and Smaller:
   1. Ferrous pipe: Class 150 malleable iron threaded unions.
   2. Copper tube and pipe: Class 150 bronze unions with soldered joints.

B. Grooved and Shouldered Pipe End Couplings:
   1. Housing: Malleable iron clamps to engage and lock, designed to permit some angular deflection, contraction, and expansion; steel bolts, nuts, and washers; galvanized for galvanized pipe.
   2. Sealing gasket: "C" shape composition sealing- gasket.

C. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

2.7 UNDERGROUND PIPE MARKERS

A. Plastic Ribbon Tape: Bright colored, continuously printed, minimum 6 inches wide by 4 mil thick, manufactured for direct burial service.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for installation examination.

B. Verify excavations are to required grade, dry, and not over-excavate.

C. Verify piping connection, size, location and invert are as indicated on Drawings.

3.2 PREPARATION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for installation preparation.

B. Remove scale and dirt, on inside and outside, before assembly.

3.3 INSTALLATION - VALVE VAULT

A. Refer to Section 33 05 17.

3.4 INSTALLATION - PIPE SUPPORTS

A. Pipe Supports:
   1. Install pipe supports in accordance with MSS SP 89.

3.5 INSTALLATION - BURIED PIPING SYSTEMS

A. Verify connection to existing piping system with regard to size, location, and invert.

B. Establish elevations of buried piping with not less than 3.5 ft of cover.

C. Establish minimum 10 feet separation from sanitary sewer piping piping in accordance with TCEQ Regulations.

D. Remove scale and dirt on inside of piping before assembly.

E. Excavate pipe trench in accordance with Section 31 23 17.

F. Install pipe to elevation as indicated on Drawings.

G. Place bedding material at trench bottom to provide uniform bedding for piping, level bedding materials in one continuous layer not exceeding six inches compacted depth; compact to 95 percent Standard Proctor density.

H. Install pipe on prepared bedding.

I. Route pipe in straight line.

J. Install pipe to allow for expansion and contraction without stressing pipe or joints.

K. Install shutoff and drain valves at locations indicated on Drawings in accordance with this Section.

L. Install plastic ribbon tape continuous over top of pipe buried 24 inches below finish grade; coordinate with Section 31 23 17.

3.6 INSTALLATION - INTERIOR PIPING SYSTEMS

A. Install non-conducting dielectric connections wherever jointing dissimilar metals.

B. Establish elevations of buried piping outside valve vault to obtain not less than 3.5 ft of cover.

C. Install water piping in accordance with ASME B31.9.

D. Install unions downstream of valves and at equipment or apparatus connections.

E. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.

3.7 INSTALLATION - BACKFLOW PREVENTER ASSEMBLIES

A. Install backflow preventer of type, size, and capacity indicated.

B. Install air-gap fitting on units with atmospheric vent connection and pipe relief outlet drain to nearest floor drain.

C. Do not install bypass around backflow preventer.

3.8 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements: Requirements for inspecting, testing.

3.9 CLEANING

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for cleaning.

B. Disinfect backflow preventer assemblies installation in accordance with Section 33 13 00.

END OF SECTION

SECTION 33 12 13 - WATER SERVICE CONNECTIONS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Pipe and fittings for residential and commercial water service connections.
   2. Corporation stop assembly.
   3. Curb stop assembly.
   4. Meter setting equipment.
   5. Water meters.
   6. Backflow preventers.
   7. Underground pipe markers.
   8. Precast concrete vault.
   9. Embedment and backfill materials.

1.2 PRICE AND PAYMENT PROCEDURES

A. Section 01 20 00 - Price and Payment Procedures Contract Sum/Price

B. Water Services:
   1. Basis of Measurement: Per each. Basis of Payment: Includes hand trimming excavation, pipe and fittings, corporation stop assembly, curb stop assembly, bedding, concrete thrust restraints, connection to municipal utility water source, and connected to private water service.

C. Water Meters:
   1. Basis of Measurement: Per each.
   2. Basis of Payment: Includes meter, meter setting equipment, fittings and accessories.

D. Backflow Preventers:
   1. Basis of Measurement: Per each.
   2. Basis of Payment: Includes backflow preventer, fittings and accessories.

1.3 REFERENCE STANDARDS

A. American Association of State Highway and Transportation Officials:
   1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.

B. American Society of Mechanical Engineers:
   1. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
   2. ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.

C. American Society of Sanitary Engineering:
   1. ASSE 1012 - Backflow Preventer with Intermediate Atmospheric Vent.
   2. ASSE 1013 - Reduced Pressure Principle Backflow Preventers.

D. ASTM International:
   1. ASTM A48/A48M - Standard Specification for Gray Iron Castings.
   2. ASTM B62 - Standard Specification for Composition Bronze or Ounce Metal Castings.
   3. ASTM B88 - Standard Specification for Seamless Copper Water Tube.
   4. ASTM C858 - Standard Specification for Underground Precast Concrete Utility Structures.
   5. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).
   6. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
   7. ASTM D1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
   8. ASTM D2241 - Standard Specification for Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter.
   9. ASTM D2466 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
   10. ASTM D2855 - Standard Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.
   11. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
   12. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

E. American Welding Society:
   1. AWS A5.8 - Specification for Filler Metals for Brazing and Braze Welding.

F. American Water Works Association:
   1. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.
   2. AWWA C700 - Cold-Water Meters - Displacement Type, Bronze Main Case.
   3. AWWA C701 - Cold-Water Meters - Turbine Type, for Customer Service.
   4. AWWA C702 - Cold-Water Meters - Compound Type.
   5. AWWA C706 - Direct-Reading, Remote-Registration Systems for Cold-Water Meters.
   6. AWWA C800 - Underground Service Line Valves and Fittings.
   7. AWWA C901 - Polyethylene (PE) Pressure Pipe and Tubing, 1/2 in. through 3 in., for Water Service.
   8. AWWA M6 - Water Meters - Selection, Installation, Testing, and Maintenance.

1.4 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures: Requirements for submittals.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Record actual locations of piping mains, curb stops, connections, thrust restraints, and invert elevations.

C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. During loading, transporting, and unloading of materials and products, exercise care to prevent any damage.

C. Store products and materials off ground and under protective coverings and custody, away from walls and in manner to keep these clean and in good condition until used.

D. Exercise care in handling precast concrete products to avoid chipping, cracking, and breakage.

PART 2 PRODUCTS

2.1 WATER SERVICE PIPING AND FITTINGS

A. Copper Tubing: ASTM B88, Type K, Class 1 annealed:
   1. Fittings: ASME B16.18, cast copper, or ASME B16.22, wrought copper.
   2. Joints: Compression connection or AWS A5.8, BCuP silver braze.

B. Polyethylene Tubing: ASTM D2737; ASTM D1598; and ASTM D1599: high density, PE3408, SDR-9, 200 psi pressure rated.
   1. Fittings: ASTM D2337.
   2. Joints: PE mechanical joint adapters or other mechanical methods based upon manufacturer's recommendation and approved by Engineer.

2.2 CORPORATION STOP ASSEMBLY

A. Manufacturers:
   1. The Ford Meter Box Company, Inc.: Model FB 1000-4 or 7-G.
   2. Substitutions: Section 01 60 00 - Product Requirements.

B. Corporation Stops:
   1. Brass conforming to ASTM B62, Table 1.
   2. Inlet end threaded for tapping according to AWWA C800.
   3. Outlet end suitable for service pipe specified.
   4. Designed for 200 psi working pressure.

C. Service Saddles:
   1. Double strap type: Smith Blair No. 317 Double Strap Saddle, or approved equal.
   2. Designed for 200 psi working pressure.

2.3 CURB STOP ASSEMBLY

A. Manufacturers:
   1. The Ford Meter Box Company, Inc.: Model B11-444W-NL, or B11-777W-NL.
   2. Substitutions: Section 01 60 00 - Product Requirements.

B. Curb Stops:
   1. Brass conforming to ASTM B62, Table 1.
   2. Plug type valve.
   3. Positive pressure sealing.
   4. Designed for 200 psi working pressure.

2.4 METER BOXES

A. Manufacturers:
   1. Meter Boxes for 3/4 Inch and 1 Inch Meters (Non-traffic Areas):
      a. Carson Industries, LLL: Specification Grade 1017, 12 inch Inverted Box with HDPE cover and ductile iron reader lid.
   2. Meter Boxes for 3/4 Inch and 1 Inch Meters (Traffic Areas):
      a. Oldcastle Precast, Inc.: Series 38-H Meter Box with cast iron hinged lid.
   3. Meter Boxes for 1 1/2 Inch Meters (Traffic and Non-traffic Areas):
      a. Oldcastle Precast, Inc.: New Style No. 65 Meter Box with cast iron hinged lid.
   4. Substitutions: Section 01 60 00 - Product Requirements.

B. Water Meters 2 Inches and Larger: Refer to Section 33 05 17 - Precast Concrete Valve Vaults and Meter Boxes.

2.5 WATER METERS

A. Residential Water Meters: Not Used

B. Commercial Water Meters:
   1. Manufacturer and Model:
      a. Sensus: OMNI T2 – 8
   2. Substitutions: Section 01 60 00 – Product Requirements.
   3. Description: AWWA C701 Class II, turbine meter assembly meeting NSF/ANSI Standard 61, Annex F and G.
   4. Meter: Brass body turbine meter with magnetic drive register.
      a. Service: Cold water, 122 degrees F.
      b. Nominal Flow: 160 gpm.
      c. Pressure Drop at Nominal Flow: 6.9 psi.
      d. Maximum Flow: 200 gpm.
      e. Maximum Operating Pressure: 200 psi.
      f. Accuracy: 1-1/2 percent.
      g. Maximum Counter Reading: 100 million gallons.

2.6 BACKFLOW PREVENTERS

A. Reduced Pressure Backflow Preventers: Refer to Section 33 12 00 – Water Utility Distribution Equipment.

B. Double Check Valve Assemblies: Refer to Section 33 12 00 - Water Utility Distribution Equipment.

2.7 UNDERGROUND PIPE MARKERS

A. Plastic Ribbon Tape: Bright colored, continuously printed, minimum 6 inches wide by 4 mil thick, manufactured for direct burial service.

2.8 PRECAST CONCRETE VAULT

A. Refer to Section 33 05 17 – Precast Concrete Valve Vaults and Meter Boxes.

2.9 EMBEDMENT AND BACKFILL MATERIALS

A. Embedment: Fill Type A4 as specified in Section 31 23 17.

B. Backfill: Fill Type A4 as specified in Section 31 23 17.

2.10 ACCESSORIES

A. Concrete for Thrust Restraints: Concrete type specified in Project Notes and indicated on the Drawings.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for installation examination.

B. Verify building service connection and municipal utility water main size, location, and invert are as indicated on Drawings.

3.2 PREPARATION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for installation preparation.

B. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, remove burrs.

C. Remove scale and dirt on inside and outside before assembly.

D. Prepare pipe connections to equipment with flanges or unions.

3.3 INSTALLATION - CORPORATION STOP ASSEMBLY

A. Make connection for each different kind of water main using suitable materials, equipment and methods approved by the Engineer.

B. Provide service clamps for mains other than of cast iron or ductile iron mains.

C. Screw corporation stops directly into tapped and threaded iron main at 10 and 2 o'clock position on main's circumference; locate corporation stops at least 12 inches apart longitudinally and staggered.

D. For plastic pipe water mains, provide full support for service clamp for full circumference of pipe, with minimum 2 inches width of bearing area; exercise care against crushing or causing other damage to water mains at time of tapping or installing service clamp or corporation stop.

E. Use proper seals or other devices so no leaks are left in water mains at points of tapping; do not backfill and cover service connection until approved by the Architect/Engineer.

3.4 EMBEDMENT

A. Excavate pipe trench in accordance with Section 31 23 17 for Work of this Section. Hand trim excavation for accurate placement of pipe to elevations indicated on Drawings.

B. Dewater excavations to maintain dry conditions and preserve final grades at bottom of excavation.

C. Provide sheeting and shoring in accordance with Sections 31 23 17 and 31 23 15.

D. Place embedment material at trench bottom; level embedment fill material in one continuous layer not exceeding 6 inches compacted depth; compact to 95 percent of standard Proctor density, as prescribed in Section 31 23 17.

3.5 INSTALLATION - PIPE AND FITTINGS

A. Maintain separation of water main from sewer piping in accordance with TCEQ Regulations.

B. Install pipe to indicated elevations.

C. Route pipe in straight line.

D. Install pipe to allow for expansion and contraction without stressing pipe or joints.

E. Install access fittings to permit disinfection of water system performed under Section 33 13 00.

F. Form and place concrete for thrust restraints at each elbow or change of direction of pipe main.

G. Establish elevations of buried piping with not less than 3.5 ft of cover.

H. Install plastic ribbon tape continuous over top of pipe buried 24 inches below finish grade; coordinate with Section 31 23 17.

I. Backfill trench.

3.6 INSTALLATION - CURB STOP ASSEMBLY

A. Set curb stops on compacted soil.

B. Center and plumb curb box over curb stops. Set box cover flush with finished grade.

3.7 INSTALLATION - WATER METERS

A. Install turbine meters in accordance with AWWA M6, with isolating valves on inlet and outlet as specified in Section 33 12 00.

3.8 INSTALLATION - BACKFLOW PREVENTERS

A. Install backflow preventer where indicated on the Contract Drawings and in accordance with manufacturer's instructions.

B. Comply with public water supply requirements and plumbing codes in regards to testing and installation requirements.

3.9 SERVICE CONNECTIONS

A. Install residential water service in accordance with public water supply requirements with meter box as indicated.

B. Install commercial water meter in precast concrete vault when indicated. Refer to Section 33 05 17.

C. Install water service to the right-of-way or property line, or as indicated on Drawings.

3.10 PRECAST CONCRETE VAULT

A. Construct precast concrete as per Section 33 05 17.

B. Seal vault joints watertight with preformed plastic joint sealant compound. Apply asphalt waterproofing to exterior walls.

C. Seal annular space between pipe and wall sleeves as indicated on the Contract Drawings.

D. Install vault covers and frames; adjust to finished grade elevation.

3.11 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Requirements for inspecting, testing.

B. Section 01 70 00 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.

C. Pressure test system in accordance with AWWA C600 and the following:
   1. Test Pressure: Not less than 200 psi.
   2. Conduct hydrostatic test for at least two-hour duration.

3. Fill section to be tested with water slowly, expel air from piping at high points. Install corporation cocks at high points. Close air vents and corporation cocks after air is expelled. Raise pressure to specified test pressure.
4. Observe joints, fittings and valves under test. Remove and renew cracked pipe, joints, fittings, and valves showing visible leakage. Retest.
5. Correct visible deficiencies and continue testing at same test pressure for additional 2 hours to determine leakage rate. Maintain pressure within plus or minus 5.0 psig of test pressure. Leakage is defined as quantity of water supplied to piping necessary to maintain test pressure during period of test.
6. Compute maximum allowable leakage by the following formula:

$L = (SD\sqrt{P})/C$
L = testing allowance, in gallons per hour
S = length of pipe tested, in feet
D = nominal diameter of pipe, in inches
P = average test pressure during hydrostatic test, in psig
C = 148,000
When pipe under test contains sections of various diameters, calculate allowable leakage from sum of computed leakage for each size.

7. When test of pipe indicates leakage greater than allowed, locate source of leakage, make corrections and retest until leakage is within allowable limits. Correct visible leaks regardless of quantity of leakage.

D. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

END OF SECTION

SECTION 33 12 16 - WATER UTILITY DISTRIBUTION VALVES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Valves.
   2. Valve boxes.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Valves:
   1. Basis of Measurement: Per each.
   2. Basis of Payment: Includes excavation, valve, valve box, accessories, tests, backfill, and for furnishing all labor, materials, tools, equipment, and incidentals necessary to complete the work.

1.3 REFERENCES

A. American Water Works Association:
   1. AWWA C500 - Metal-Seated Gate Valves for Water Supply Service.
   2. AWWA C509 - Resilient-Seated Gate Valves for Water-Supply Service.
   3. AWWA C550 - Protecting Epoxy Interior Coating for Valves and Hydrants.
   4. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.

B. National Sanitation Foundation:
   1. NSF 61 - Drinking Water System Components - Health Effects

1.4 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures: Requirements for submittals.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Record actual locations of valves.

C. Provide Operation and Maintenance Data for valves.

1.6 QUALIFICATIONS

A. Manufacturer: company specializing in manufacturing Products specified in this section with minimum ten years documented experience.

B. Installer: Company specializing in performing work of this section with minimum five years documented experience.

1.7 PRE-INSTALLATION MEETINGS – Not Used

1.8 DELIVERY, STORAGE AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing and protecting products.

B. Prepare valves and accessories for shipment according to AWWA Standards and seal valve and ends to prevent entry of foreign matter into product body.

C. Store products in areas protected from weather, moisture, or possible damage; do not store products directly on ground; handle products to prevent damage to interior or exterior surfaces.

1.9 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site.

B. Conduct operations not to interfere with, interrupt, damage, destroy, or endanger integrity of surface or subsurface structures or utilities, and landscape in immediate or adjacent areas.

1.10 COORDINATION – Not Used

1.11 MAINTENANCE MATERIALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for maintenance materials.

B. Furnish one tee wrench to Owner; required length.

PART 2 PRODUCTS

2.1 DOUBLE-DISC GATE VALVES – Not Used

2.2 RESILIENT WEDGE GATE VALVES

A. Manufacturers:
   1. American Cast Iron Pipe Company.
   2. Clow Valve Company.
   3. Mueller Co.

B. Resilient Wedge Gate Valves (for Gate Valves 3-inch through 24-inch diameters): AWWA C509; and AWWA C515; ductile iron body; including the manufacturer's name, pressure rating, and year of fabrication cast into valve body.
   1. Gate: Resilient seat.
   2. Stem: Non-rising stem.
   3. Seals: O-ring stem seals.
   4. Operating Nut: 2-inch square; open counterclockwise unless otherwise indicated.

5. Ends: Flanged or mechanical joint end connections.
6. Coating: AWWA C550; epoxy-coated interior/exterior.
7. Sizes 12-inch diameter and smaller: 200 psig pressure rated.
8. Sizes 16- inch diameter through 24-inch diameter: 150 psig pressure rated.
9. Valves shall be installed in a vertical position.
10. Tapping valves shall have lip for tapping machine.
11. The number of turns to fully open or close a valve shall be 3 times the diameter plus 2.
12. All external nuts, bolts, and washers shall be as specified in Section 33 11 13 - Public Water Utility Distribution Piping.
13. Mechanical joint end connections shall be connected to the pipe with a Wedge Action Restraining Gland for Ductile Iron Mechanical Joint as per Section 33 11 13 – Public Water Utility Distribution Piping.

2.3 GATE VALVE BOXES

A. 12-inch Diameter Valves and Smaller: Ductile iron, two-piece, screw type.

B. 12-inch through 20-inch Diameter Valves: Cast iron, three-piece, screw type; round base.

C. Cast iron lid, marked "Water".

2.4 BUTTERFLY VALVES – Not Used

2.5 ACCESSORIES

A. Concrete for Thrust Restraints: Concrete as specified in Project Notes and as indicated.

B. Valve Box Aligner: High-strength, plastic device designed to automatically center valve box base and prevent valve box base from shifting off center during backfilling.

PART 3 EXECUTION

3.1 EXAMINATION

A. Determine exact location and size of valves from Drawings; obtain clarification and directions from Engineer prior to execution of work.

B. Verify invert elevations of existing work prior to excavation and installation of valves.

3.2 PREPARATION

A. Identify required lines, levels, contours and datum locations.

B. Locate, identify, and protect utilities to remain from damage.

C. Do not interrupt existing utilities without permission and without making arrangements to provide temporary utility services.
   1. Notify Engineer not less than two days in advance of proposed utility interruption.
   2. Do not proceed without written permission from the Engineer.

D. Perform trench excavation, backfilling and compaction in accordance with Section 31 23 17.

3.3 INSTALLATION

A. Install valves in conjunction with pipe laying; set valves plumb.

B. Provide buried valves with valve boxes installed flush with finished grade.

3.4 DISINFECTION OF WATER PIPING SYSTEM

A. Flush and disinfect system in accordance with Section 33 13 00.

3.5 FIELD QUALITY CONTROL

A. See Section 01 40 00 – Quality Requirements: Field inspecting, testing, adjusting and balancing.

END OF SECTION

SECTION 33 12 19 - WATER UTILITY DISTRIBUTION FIRE HYDRANT ASSEMBLIES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Fire hydrants.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Fire Hydrant Assemblies:
   1. Basis of Measurement: Per each.
   2. Basis of Payment: Includes excavation, fire hydrant, M.J. Tee, 6-inch ductile iron pipe, 6-inch resilient-seat gate valve, valve box, pipe restraints, thrust blocking, gradelok, appurtenances, tests, embedment, and backfill, and for all other incidentals necessary to complete the fire hydrant assembly installation.

1.3 REFERENCES

A. American Water Works Association:
   1. AWWA C502 - Dry-Barrel Fire Hydrants.
   2. AWWA C550 - Protecting Epoxy Interior Coating for Valves and Hydrants.
   3. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.

B. National Sanitation Foundation:
   1. NSF 61 - Drinking Water System Components - Health Effects

C. National Fire Protection Association:
   1. NFPA 281 - Recommended Practice for Fire Flow Testing and Marking of Hydrants

1.4 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures: Requirements for submittals.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Record actual locations of fire hydrants.

C. Provide Operation and Maintenance Data for fire hydrants.

1.6 QUALITY ASSURANCE

A. Provide uniform color scheme for fire hydrants in accordance with NFPA 281 and in accordance with the public water supply entity.

1.7 QUALIFICATIONS

A. Manufacturer: company specializing in manufacturing Products specified in this section with minimum ten years documented experience.

B. Installer: Company specializing in performing work of this section with minimum five years documented experience.

1.8 PRE-INSTALLATION MEETINGS – Not Used

1.9 DELIVERY, STORAGE AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing and protecting products.

B. Prepare hydrants and accessories for shipment according to AWWA Standards and seal hydrant and ends to prevent entry of foreign matter into product body.

C. Store products in areas protected from weather, moisture, or possible damage; do not store products directly on ground; handle products to prevent damage to interior or exterior surfaces.

1.10 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site.

B. Conduct operations not to interfere with, interrupt, damage, destroy, or endanger integrity of surface or subsurface structures or utilities, and landscape in immediate or adjacent areas.

1.11 COORDINATION – Not Used

PART 2 PRODUCTS

2.1 FIRE HYDRANTS

A. Manufacturers:
   1. American Cast Iron Pipe Company: American Darling B-84-B.
   2. Water Products Company: Clow Medallion.
   3. Mueller Co.: Centurion.
   4. U.S. Pipe: Metropolitan.

B. Dry-barrel Break-away Type: AWWA C502; Factory Mutual Research Corporation and Underwriter's Laboratories UL 246 Standard.
   1. Rated Working Pressure: 200 psi.
   2. Test Pressure: 400 psi.
   3. Body: Cast iron.
   4. Main Valve Closure: Compression type, opening against pressure and closing with pressure.

5. Traffic breakaway type with safety stem coupling and breakable flanges that permits full 360 degree rotation of the nozzle section.
6. Bury Depth: 3.5 feet.
7. Inlet Connection: 6 inches.
8. Valve Opening: 5-1/4 inches diameter designed to permit removal of all working parts (including waste valve) from top of hydrant without disturbing the surface adjacent to the hydrant and without disassembling the ground-line joint or nozzle connections.
9. Ends: Mechanical Joint (with wedge-type restraints).
10. Fittings: Ductile iron pipe per Section 33 11 13 – Public Water Utility Distribution Piping.
11. Bolts and Nuts: Per Section 33 11 13 – Public Water Utility Distribution Piping.
12. Operating Nut: Tapered, pentagon (five sided) measuring ½ inch point to flat and 1 inch flat measurement (National Standard).
13. Direction of Opening: Counterclockwise unless otherwise indicated.
14. Fire Hydrant Leads: Ductile iron pipe per Section 33 11 13 – Public Water Utility Distribution Piping.
15. Hydrant Bonnet Assembly: Provide with a lubrication reservoir that automatically circulates lubricant to all operating stem threads and bearing surfaces each time the hydrant is operated. Downward stem travel limited by a travel stop located in the upper housing of the hydrant.
16. Hydrants shall be provided with a minimum of one internal and two external automatic and positively operating non-corrodible drain valves so as to allow main pressure to flush the drain valves completely during the opening motion and drain the hydrant completely when the main valve is shut. Drain valves operating by gravity or springs are not acceptable. Outlets for drainage of the barrel shall be made of bronze or non-corrodible metal or bushed therewith completely from the valve to the outside.

C. Outlets/Nozzles
1. Two Hose Outlets: 2-1/2 inch outlet per National Standard.
2. One Pumper Outlet: National Standard fire hose coupling screw threads, AWWA C502-73, Appendix A, Table A-2. 4-1/2 inch nominal size of hose coupling.
3. Caps furnished for the two hose nozzles and 1 pumper nozzle. Threads for nozzles/caps per National Standard.

D. Coating: AWWA C550.
1. Exterior Finish: Primer and two coats of epoxy color in accordance with public water supply entity (red).
2. Interior: Epoxy.

2.2 ACCESSORIES

A. Concrete for Thrust Restraints: Concrete type specified in Project Notes and as indicated.

B. Aggregate: Aggregate for hydrant drainage specified in Section 32 05 16.

PART 3 EXECUTION

3.1 EXAMINATION

A. Determine exact location and size of hydrants from Drawings; obtain clarification and directions from Engineer prior to execution of work.

B. Verify invert elevations of existing work prior to excavation and installation of fire hydrants.

3.2 PREPARATION

A. Identify required lines, levels, contours and datum locations.

B. Locate, identify, and protect utilities to remain from damage.

C. Do not interrupt existing utilities without permission and without making arrangements to provide temporary utility services.
   1. Notify Engineer not less than two days in advance of proposed utility interruption.
   2. Do not proceed without authorization from the Engineer.

D. Perform trench excavation, backfilling and compaction in accordance with Section 31 23 17.

3.3 INSTALLATION

A. Install fire hydrants; provide support blocking and drainage aggregate; do not block drain hole.

B. Set hydrants plumb with pumper nozzle facing roadway; set hydrants with centerline of pumper nozzle 18 inches above finished grade and safety flange not more than 6 inches nor less than 2 inches above grade.

C. After hydrostatic testing, flush hydrants and check for proper drainage.

3.4 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

A. Flush and disinfect system in accordance with Section 33 13 00.

3.5 FIELD QUALITY CONTROL

A. See Section 01 40 00 – Quality Requirements: Field inspecting, testing, adjusting, and balancing.

END OF SECTION

SECTION 33 13 00 - DISINFECTING OF WATER UTILITY DISTRIBUTION

PART 1 GENERAL

1.1 SUMMARY

A. Section includes disinfection of potable water distribution and transmission system; and testing and reporting results.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Disinfection:
   1. Basis of Measurement and Payment: Disinfection shall not be measured for payment, but shall be subsidiary to other items of the work for which it pertains.

1.3 REFERENCES

A. American Water Works Association:
   1. AWWA B300 - Hypochlorites.
   2. AWWA B301 - Liquid Chlorine.
   3. AWWA B302 - Ammonium Sulfate.
   4. AWWA B303 - Sodium Chlorite.
   5. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.
   6. AWWA C651 - Disinfecting Water Mains.

1.4 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures: Requirements for submittals.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Disinfection Report:
   1. Type and form of disinfectant used.
   2. Date and time of disinfectant injection start and time of completion.
   3. Test locations.
   4. Name of person collecting samples.
   5. Initial and 24 hour disinfectant residuals in treated water in ppm for each outlet tested.
   6. Date and time of flushing start and completion.
   7. Disinfectant residual after flushing in ppm for each outlet tested.

C. Bacteriological Report:
   1. Date issued, project name, and testing laboratory name, address, and telephone number.
   2. Time and date of water sample collection.
   3. Name of person collecting samples.
   4. Test locations.
   5. Initial and 24 hour disinfectant residuals in ppm for each outlet tested.
   6. Coliform bacteria test results for each outlet tested.

7. Certify water conforms, or fails to conform, to bacterial standards of public water supply entity.

D. Water Quality Certificate: Certify water conforms to quality standards of public water supply entity, suitable for human consumption.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with AWWA C651.

B. Laboratory approved by the Texas Health Department and the Texas Commission on Environmental Quality (TCEQ).

1.7 QUALIFICATIONS

A. Water Treatment Firm: Company specializing in disinfecting potable water systems specified in this section with minimum three years documented experience.

B. Testing Firm: Company specializing in testing potable water systems, certified by State of Texas.

C. Submit bacteriologist's signature and authority associated with testing.

PART 2 PRODUCTS

2.1 DISINFECTION CHEMICALS

A. Chemicals:
1. AWWA B300, Hypochlorite.
2. AWWA B301, Liquid Chlorine.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify piping system has been flushed at a minimum velocity of three feet per second at a 40 psi residual pressure such that all particles are removed from the line.

B. Verify piping system has been pressure tested in accordance with Section 33 11 33 – Public Water Utility Distribution Piping.

C. Perform scheduling and disinfecting activity with start-up, water pressure testing, adjusting and balancing, demonstration procedures, including coordination with related systems.

3.2 DISINFECTING PROCEDURE AND DOSAGE

A. Disinfect all potable water pipelines and appurtenances per AWWA C651.

B. Provide equipment to perform the Work of this section.

C. Provide the water source for filling, flushing, and disinfecting the lines. Only potable water shall be used. Provide all required temporary pumps and storage facilities required to complete the specified flushing and disinfecting operations.

D. Introduce treatment into one end of the piping system. A chlorine-water mixture shall be uniformly introduced into the pipeline by means of a solution-feed chlorinating device. The chlorine solution shall be introduced at one end of the pipeline through a tap in such a manner that as the pipeline is filled with water, the dosage applied to the water entering the pipe shall be a minimum of 50 mg/l. All valves, hydrants, etc. shall be operated to disinfect all parts. Care shall be taken to prevent the strong chlorine solution in the line being disinfected from flowing back into the line supplying the water.

E. Maintain disinfectant in system for 24 hours. After 24 hours, the free chlorine residual of the chlorine-treated water at the extremities of the pipeline being tested shall be at least 25 mg/l.

F. After the 24-hour retention period, the water shall contain no less than 25 mg/l chlorine throughout the treated section of pipeline.

G. Repetition of Test: The disinfection testing procedure shall be repeated if the initial tests fail to produce satisfactory results. Two consecutive satisfactory test results shall be required after any unsatisfactory test.

H. Upon completion of retention period required for disinfection, flush pipeline until chlorine concentration in water leaving pipeline is no higher than that generally prevailing in existing system or is acceptable for domestic use.

I. Neutralization of Chlorinated Water: Neutralizing and disposing of chlorinated water shall be in accordance with Appendix B of AWWA Standard C651.

3.3 BACTERIOLOGICAL TESTING OF DISINFECTED PIPELINES

A. After final flushing and before pipeline is connected to existing system, or placed in service, employ an approved independent testing laboratory to sample, test for bacteriological quality and certify water quality suitable for human consumption. Two sets of samples drawn 24 hours apart shall be taken at locations prescribed by AWWA C651. One test sample shall be drawn from the end of the main and additional samples collected at intervals not exceeding 1000 feet along the pipeline.

B. Install sufficient sampling taps at proper locations along the pipeline. Each sampling tap shall consist of a standard corporation cock installed in the line and extended with a copper tubing gooseneck assembly. After samples have been collected, the gooseneck assembly may be removed and retained for future use.

C. Samples for bacteriological analysis shall be collected only from suitable sampling taps in sterile bottles treated with sodium thiosulfate. Samples shall not be drawn from hoses, fire hydrants, etc.

D. Bacteriological testing shall be in accordance with the Standard Methods for the Examination of Water and Wastewater, latest edition.

E. If the initial disinfection fails to produce acceptable sample tests, the disinfection procedure shall be repeated (without extra compensation) until satisfactory test results have been obtained before the piping may be placed in service.

END OF SECTION

SECTION 33 31 13 - PUBLIC SANITARY UTILITY SEWERAGE PIPING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Sanitary sewer pipe and fittings.
2. Underground pipe markers.
3. Connection to existing manholes.
4. Manholes.
5. Wye branches and tees.
6. Sanitary Laterals.
7. Pile support systems.
8. Bedding, embedment, and backfill materials.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Pipe and Fittings:
1. Basis of Measurement: By the linear foot.
2. Basis of Payment: Includes excavation, bedding, embedment, backfill, pipe and fittings, to indicated depth and connection to existing sewer.

B. Sewer Services:
1. Basis of Measurement: Per Each.
2. Basis of Payment: Includes excavation, bedding, embedment, backfill, pipe and fittings, wye, cleanout, box, and incidentals, complete and in-place.

1.3 REFERENCES

A. American Association of State Highway and Transportation Officials:
1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.

B. ASTM International:
1. ASTM A74 - Standard Specification for Cast Iron Soil Pipe and Fittings.
2. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
3. ASTM C14 - Standard Specification for Concrete Sewer, Storm Drain, and Culvert Pipe.
4. ASTM C76 - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
5. ASTM C443 - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.
6. ASTM C564 - Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
7. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).
8. ASTM C923 - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals.

9. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
10. ASTM D1785 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
11. ASTM D2235 - Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings.
12. ASTM D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
13. ASTM D2466 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
14. ASTM D2564 - Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems.
15. ASTM D2729 - Standard Specification for Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
16. ASTM D2751 - Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings.
17. ASTM D2855 - Standard Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.
18. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
19. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
20. ASTM D3034 - Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
21. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

C. American Water Works Association:
1. AWWA C104 - American National Standard for Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
2. AWWA C105 - American National Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems.
3. AWWA C110 - American National Standard for Ductile-Iron and Grey-Iron Fittings, 3 in. through 48 in. (75 mm through 1200 mm), for Water and Other Liquids.
4. AWWA C111 - American National Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
5. AWWA C150 - ANSI Standard for the Thickness Design of Ductile Iron Pipe.
6. AWWA C151 - American National Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water.
7. AWWA C153 - American National Standard for Ductile-Iron Compact Fittings for Water Service.

D. National Fire Protection Association:
1. NFPA 24 - Installation of Private Fire Service Mains and Their Appurtenances.

1.4 DESIGN REQUIREMENTS – TEMPORARY BYPASS PIPELINE SYSTEM

A. Bypass pipeline system shall have sufficient capacity to bypass the flow around the work area. The Contractor shall provide all pipeline plugs and temporary discharge piping to ensure that

the total flow of the main can be safely diverted around the section to be replaced. Bypass pipeline system will be required to be operated 24 hours per day.

B. Provide adequate standby piping available and ready for immediate operation and use in the event of an emergency.

C. Bypass pipeline system shall be capacity of bypassing the flow around the work area.

D. Make all arrangements for the bypass pipeline during the time when the force main is shut down.

1.5 PERFORMANCE REQUIREMENTS – TEMPORARY BYPASS PIPELINE SYSTEM

A. It is essential to the operation of the existing sewerage system that there be no interruption in the flow of sewage throughout the duration of the wastewater installation work. To this end, the Contractor shall provide, maintain and operate all temporary facilities such as dams, plugs, conduits and all other labor and equipment to intercept the sewage flow before it reaches the point where it would interfere with his work, carry it past his work and return it to the existing sewer downstream of his work.

B. The design, installation and operation of the temporary pipeline system shall be the Contractor's responsibility. The bypass system shall meet the requirements of all codes and regulatory agencies having jurisdiction.

C. Provide all necessary means to safely convey the sewage past the work area. The Contractor will not be permitted to stop or impede the main flows under any circumstances.

D. Maintain sewer flow around the work area in a manner that will not cause surcharging of sewers, damage to sewers and that will protect public and private property from damage and flooding.

E. Protect water resources, wetlands and other natural resources.

F. Any spillage, backups and/or overflows, etc. as a result of inadequate pipeline equipment are the sole responsibility of the Contractor.

1.6 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures: Requirements for submittals.

1.7 SUBMITTALS – TEMPORARY BYPASS PIPLINE SYSTEM

A. See Section 01 33 00 - Submittal Procedures: Requirements for submittals.

1.8 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Record location of pipe runs, connections, manholes, cleanouts, and invert elevations.

1.9 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.

1.10 PRE-INSTALLATION MEETINGS – Not Used

1.11 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Deliver and store valves in shipping containers with labeling in place.

C. Block individual and stockpiled pipe lengths to prevent moving.

1.12 FIELD MEASUREMENTS

A. Verify field measurements and elevations are as indicated on Drawings.

1.13 COORDINATION – Not Used

PART 2 PRODUCTS

2.1 SANITARY SEWER PIPE AND FITTINGS

A. Sanitary Sewer Pipe: ASTM D3034, SDR 26, Poly (Vinyl Chloride) (PVC) material; bell and spigot style rubber ring sealed gasket joint for all piping up to 15 in diameter. Piping greater than 15 in diameter shall be F679 PS 46 (Vinyl Chloride) (PVC) material; bell and spigot style rubber ring sealed gasket joint.
   1. Fittings: ASTM D3034, SDR 35, PVC material.
   2. Joints: ASTM F477, elastomeric gaskets.

2.2 SANITARY SEWER SERVICE PIPE AND FITTINGS

A. Service Pipe: ASTM 3034, SDR 26 Poly (Vinyl Chloride) (PVC) material; bell and spigot style rubber ring gasket joint.

B. Fittings: ASTM 3034, SDR 35, PVC material.

C. Joints: ASTM 477, elastomeric gaskets.

2.3 FLEXIBLE COUPLINGS

A. Manufacturers:
   1. Fernco, Inc.
   2. The Metraflex Company.
   3. Siemens AG Water Technologies.
   4. Substitutions: Section 01 60 00 - Product Requirements.

B. Flexible Coupling: Resilient chemical-resistant elastomeric polyvinyl chloride (PVC) coupling, two Series 300 stainless steel clamps and stainless steel screws and housings.

2.4 FLEXIBLE PIPE BOOT FOR MANHOLE PIPE ENTRANCES

A. Manufacturers:
1. A-Lok.
2. J-K Polysource, Inc.
3. Trelleborg Pipe Seals Milford, Inc.
4. Substitutions: Section 01 60 00 - Product Requirements.

B. Flexible Pipe Boot: ASTM C923, ethylene propylene rubber (EPDM), Series 300 stainless steel clamp and stainless steel hardware.

2.5 CONCRETE ENCASEMENT AND CRADLES

A. Concrete: Conforming to Project Notes, 3000 psi 28 day concrete, rough troweled finish, as indicated on Drawings.

B. Concrete Reinforcement: Conform to Project Notes, when indicated.

2.6 MANHOLES

A. Manholes: Conform to Section 33 05 14 or Section 33 05 15, as indicated on Drawings.

2.7 BEDDING, EMBEDMENT, AND BACKFILL MATERIALS

A. Bedding Material: As specified in Section 31 23 17.

B. Embedment Material: As specified in Section 31 23 17.

C. Backfill Material: As specified in Section 31 23 17.

2.8 ACCESSORIES – Not Used

2.9 DISCHARGE PIPING – TEMPORARY BYPASS PIPELINE SYSTEM

A. In order to prevent the accidental spillage of flows all discharge system shall be temporarily constructed of rigid pipe with positive restrained joints. Under no circumstances will aluminum irrigation type piping or glued PVC pipe be allowed. Discharge hose will only be allowed in short sections and by specific permission from the Engineer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify trench excavation is ready to receive work and excavations, dimensions, and elevations are as indicated on drawings.

3.2 PREPARATION

A. Correct over excavation with coarse aggregate.

B. Remove large stones or other hard matter capable of damaging pipe or impeding consistent backfilling or compaction.

C. Protect and support existing sewer lines, utilities and appurtenances.

D. Maintain profiles of utilities. Coordinate with other utilities to eliminate interference. Notify Engineer where crossing conflicts occur.

E. Locate any existing utilities in the area the Contractor selects to locate the bypass pipelines in order to minimize any disturbance to existing utilities and shall obtain approval of the pipeline locations from the City and the Engineer. All cost associated with relocating utilities and obtaining approvals shall be paid by the Contractor.

F. During all bypass piping operations, protect the existing sewer manholes. The Contractor is responsible for all physical damage caused by Contractors operations.

3.3 BEDDING

A. Excavate pipe trench in accordance with Section 31 23 17.

B. Excavate to lines and grades shown on Drawings.

C. Dewater excavations to maintain dry conditions and preserve final grades at bottom of excavation.

D. Provide sheeting and shoring in accordance with Section 31 23 17 and Section 31 23 15.

E. Bedding shall be required to bring the trench bottom up to grade and shall be the same material as the embedment. The bedding shall be contoured at each belled joint to permit proper joint assembly while maintaining uniform pipe support.

F. Place bedding to a compacted depth as indicated on the Drawings and in accordance with Section 31 23 17.

G. Maintain optimum moisture content of bedding material to attain the required compaction density as specified in Section 31 23 17.

3.4 INSTALLATION - PIPE

A. All wastewater installations to be in accordance with Texas Commission on Environmental Quality (TCEQ) Chapter 217.

B. Sanitary sewers that are parallel, or cross, waterlines shall be installed in accordance with the Texas Administrative Code (TAC), Rule 290.44.

C. Install pipe, fittings, and accessories in accordance with ASTM D2321.

D. Lay pipe to slope gradients noted on Drawings.

E. Assemble and handle pipe in accordance with manufacturer's instructions.

F. Keep pipe and fittings clean until work is completed and accepted by Engineer. Cap open ends during periods of work stoppage.

G. Lay bell and spigot pipe with bells upstream.

H. Connect pipe to existing sewer system at existing manhole as indicated on Drawings.

3.5 INSTALLATION - CONNECTION TO EXISTING MANHOLE

A. Core drill existing manhole to clean opening. Using pneumatic hammers, chipping guns, or sledge hammers is not permitted.

B. Install watertight neoprene gasket and seal with non-shrink concrete grout.

C. Prevent construction debris from entering existing sewer line when making connection.

3.6 INSTALLATION - MANHOLES

A. Install manholes in accordance with Section 33 05 14.

3.7 INSTALLATION - WYE BRANCHES AND TEES

A. Install wye branches or pipe tees at locations indicated on Drawings concurrent with pipe laying operations. Use standard fittings of same material and joint type as sewer main.

B. Use saddle wye or tee with stainless steel clamps for taps into existing piping. Mount saddles with solvent cement or gasket and secure with metal bands. Layout holes with template and cut holes with mechanical cutter.

3.8 INSTALLATION - SANITARY LATERALS

A. Construct laterals from wye branch to terminal point at right-of-way or as indicated on Drawings.

B. Where depth of main pipeline warrants, construct riser type laterals from wye branch.

C. Maintain 3 feet minimum depth of cover over pipe, or as indicated on Drawings.

D. Install watertight plug, braced to withstand pipeline test pressure thrust, at termination of lateral. Install temporary marker stake extending from end of lateral to 12 inches above finished grade. Paint top 6 inches of stake with flourescent orange paint.

3.9 INSTALLATION AND REMOVAL – TEMPORARY BYPASS PIPELINE SYSTEM

A. Installation of bypass pipelines:
   1. Pipeline may be placed along shoulder of roads.

2. When bypass pipeline crosses local streets and private driveways, place in roadway ramps or place pipeline in trenches and cover with temporary pavement.
3. Pipeline may not be located on Union Pacific Railroad right-of-way.

B. Remove manhole sections or make connections to the existing sewer at the locations indicated on the Drawings.

C. When working inside manhole or force main, exercise caution and comply with OSHA requirements when working in the presence of sewer gases, combustible or oxygen-deficient atmospheres, and confined spaces.

D. The pipeline must be located off streets and on shoulders of the roads. When the bypass pipeline crosses local streets and private driveways, the Contractor must place the bypass pipelines in roadway ramps or in trenches and cover with temporary pavement. Upon completion of the bypass pipeline operations, the Contractor shall remove all the piping, restore all property to pre-construction condition and restore all pavement.

3.10 EMBEDMENT

A. Place embedment around sides and above the top of pipe in accordance with Section 31 23 17 and as indicated on Drawings.

B. Maintain optimum moisture content of embedment material to attain required compaction density.

C. Request inspection prior to and immediately after placing embedment.

3.11 CONCRETE ENCASEMENT

A. Encase pipe in concrete when indicated on Drawings and in accordance with Project Notes.

B. All flexible adapters, bends, and tees on service lines shall be encased in 6 inches (minimum) of concrete in accordance with Project Notes.

3.12 BACKFILL

A. Place backfill above embedment material in accordance with Section 31 23 17 and as indicated on Drawings.

3.13 FIELD QUALITY CONTROL

A. See Section 01 40 00 – Quality Requirements: Field inspecting, testing, adjusting, and balancing.

3.14 PROTECTION OF FINISHED WORK

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for protecting finished Work.

B. Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress.

END OF SECTION