



**CITY OF LEON VALLEY
BID #2024-01**

CDBG EAST OF WURZBACH SEWER MAIN

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CDBG EAST OF WURZBACH SEWER MAIN

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CHECK LIST OF ITEMS TO SUBMIT WITH BID

- Addenda (if any)
- Bid Bond
- Bid Form
- Contractor's Disclosure Statement
- Conflict of Interest Questionnaire
- Proof of Insurance including WC

SECTION 1 - BID ADVERTISEMENT

ADVERTISEMENT FOR **BID #2024-01 CDBG EAST OF WURZBACH SEWER MAIN**
for the City of Leon Valley.

Sealed bids will be received until **June 11th, 2024** by the Purchasing Agent of the City of Leon Valley, Texas, 6400 El Verde, Leon Valley, TX 78238. Bids will be publicly opened and read aloud at **10:00 a.m.** in the City Council Chamber of the City Hall located at 6400 El Verde, Leon Valley, TX 78238.

Bid/Contract Documents and Specifications are free and only available electronically. Please visit the City of Leon Valley website at www.leonvalleytexas.gov/government/finance/purchasing.php, Public Purchase at www.publicpurchase.com or CIVCAST at www.civcastusa.com. There is no cost to view the bid documents and can be downloaded and printed through the websites. Sets of hard copies of the Bid Documents will not be sold. There will be a non-mandatory pre-bid meeting held at City Hall located at 6400 El Verde **June 4th, 2024**.

Bidders must use the bid form provided in the specifications and submit bid in a sealed envelope. The outside of the envelope must be clearly endorsed "**BID #2024-01 CDBG EAST OF WURZBACH SEWER MAIN**". Each bid shall be accompanied by a bid guarantee in the form of a certified check, cashier's check, or bid bond in the amount of five percent (5%) of the total bid price. Any bid received after closing time will be rejected and returned unopened.

Attention is called to the fact that, pursuant to V.T.C.S. Art. 5159a, not less than the local prevailing wage rate derived from Leon Valley Ordinance #16-005 included herein, must be paid on this locally funded project.

The successful bidder will be required to furnish a one hundred percent (100%) Performance Bond and a one hundred percent (100%) Payment Bond.

The City of Leon Valley reserves the right to reject any and all bids, to award the bid to the lowest responsible bidder or to the bidder who provides the best value to the City, and to waive any informality or technicality in the bid. The City agrees to take action within sixty (60) days after the bid opening.

SECTION 2 - INSTRUCTIONS TO BIDDERS

1 - DEFINED TERMS

1.1 Terms used in these Instructions to Bidders will have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below which are applicable to both the singular and plural thereof:

- A. Bidder--The individual or entity who submits a Bid directly to OWNER.
- B. Issuing Office--The office from which the Bidding Documents are to be issued and where the bidding procedures are to be administered.
- C. Successful Bidder--The lowest responsible Bidder submitting a responsive Bid to whom OWNER (on the basis of OWNER's evaluation as hereinafter provided) makes an award.
- D. Owner - City of Leon Valley
- E. Engineer – Ardurra Group, Inc

2 - BIDDING DOCUMENTS REQUIRED

2.1 Complete Bidding Documents are available electronically only and may be downloaded online at www.leonvalleytexas.gov/government/finance/purchasing.php, Public Purchase at www.publicpurchase.com or CIVCAST at www.civcastusa.com.

2.2 Complete sets of Bidding Documents must be used in preparing Bids; OWNER assumes no responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

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

3 - QUALIFICATIONS OF BIDDERS

3.1 To demonstrate Bidder's qualifications to perform the Work, within five days of OWNER's request Bidder shall submit written evidence such as financial data, previous experience, present commitments, and such other data as may be called for below:

- A. Name, address and telephone number of the bonding company, authorized to do business in the State of Texas, which would furnish Payment and Performance Bonds in the amount of your bid;
- B. Name, address and telephone number of the insurance company, authorized to do business in the State of Texas, which would furnish Certificate(s) of Insurance per the requirements in the Other Conditions and General Conditions.
- C. If CONTRACTOR plans to utilize subcontractors for this project, also furnish all of the requested information on the subcontractor's firm(s).
- D. CONTRACTOR shall complete and submit with his bid, CONTRACTOR'S Disclosure Statement, which form is included in this document.

E. CONTRACTOR shall submit with his bid, a copy of his Worker's Compensation insurance certificate.

4 - EXAMINATION OF BIDDING DOCUMENTS, OTHER RELATED DATA, AND SITE

4.1 Subsurface and Physical Conditions

A. There are no reports of explorations and test of subsurface conditions for this project.

4.2 Underground Facilities

A. Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site is based upon information and data furnished to OWNER by owners of such Underground Facilities, including OWNER, or others.

4.3 Hazardous Environmental Condition

A. There are no reports or drawings relating to a Hazardous Environmental Condition identified at the Site.

4.4 Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work.

4.5 Reference is made to the identification of the general nature of other work that is to be performed at the Site by OWNER or others (such as utilities and other prime contractors) that relates to the Work for which a Bid is to be submitted. On request, OWNER will provide to each Bidder for examination access to or copies of Contract Documents (other than portions thereof related to price) for such other work.

4.6 It is the responsibility of each Bidder before submitting a Bid to:

A. examine and carefully study the Bidding Documents, including any Addenda and the other related data identified in the Bidding Documents;

B. visit the Site and become familiar with and satisfy Bidder as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;

C. become familiar with and satisfy Bidder as to all federal, state, and local Laws and Regulations that may affect cost, progress, or performance of the Work;

D. obtain and carefully study (or assume responsibility for doing so) all additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including any specific means, methods, techniques, sequences, and procedures

of construction expressly required by the Bidding Documents, and safety precautions and programs incident thereto;

E. agree at the time of submitting its Bid that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price bid and within the times and in accordance with the other terms and conditions of the Bidding Documents;

F. become aware of the general nature of the work to be performed by OWNER and others at the Site that relates to the Work as indicated in the Bidding Documents;

G. correlate the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents;

H. promptly give OWNER written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by OWNER is acceptable to Bidder; and

I. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work.

4.7 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement, that without exception the Bid is premised upon performing and furnishing the Work required by the Bidding Documents and applying any specific means, methods, techniques, sequences, and procedures of construction that may be shown or indicated or expressly required by the Bidding Documents, that Bidder has given OWNER written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in the Bidding Documents and the written resolutions thereof by OWNER are acceptable to Bidder, and that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.

5 - PRE-BID CONFERENCE

5.1 There will be a non-mandatory pre-bid meeting held at the City of Leon Valley City Hall located at 6400 El Verde **June 4th, 2024**.

6 - SITE AND OTHER AREAS

6.1 The Site is identified in the Bidding Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment, or storage of materials and equipment to be incorporated in the Work are to be obtained and paid for by CONTRACTOR.

7 - INTERPRETATIONS AND ADDENDA

7.1 All questions about the meaning or intent of the Bidding Documents are to be submitted to ENGINEER via email with **"BID #2024-01 CDBG EAST OF WURZBACH SEWER MAIN"** placed in the subject line to Byron Sanderfer, Ardurra Group, Inc. at DMACDONALD@ARDURRA.COM. Once an email is received by the

ENGINEER, a received response will be emailed back to the sender. It is the sender's responsibility to verify receipt of email. Interpretations or clarifications considered necessary by OWNER in response to such questions will be issued as an Addendum and posted on the City of Leon Valley website at: www.leonvalleytexas.gov/government/finance/purchasing.php, Public Purchase at www.publicpurchase.com or CIVCAST at www.civcastusa.com. Questions received less than ten days prior to the date for opening of Bids may not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect. For questions unrelated to meaning or intent, you may call Melinda Moritz, Director of Public Works at (210) 681-1232, ext. 203.

7.2 Addenda may be issued to clarify, correct, or change the Bidding Documents as deemed advisable by OWNER.

8 - BID SECURITY

8.1 A Bid must be accompanied by Bid security made payable to OWNER in an amount of 5% of Bidder's maximum Bid price and in the form of a certified check, a cashier's check, or a Bid Bond issued by a surety meeting the requirements set forth herewith.

8.2 The Bid security of the Successful Bidder will be retained until such Bidder has executed the Contract Documents, furnished the required contract security and met the other conditions of the Notice of Award, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 15 days after the Notice of Award, OWNER may annul the Notice of Award and the Bid security of that Bidder will be forfeited. The Bid security of other Bidders whom OWNER believes to have a reasonable chance of receiving the award may be retained by OWNER until the earlier of seven days after the Effective Date of the Agreement or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be returned.

8.3 Within seven days from the date the bid is awarded by City Council, bid securities in the form of a Certified Check or a Cashier's Check of non-successful Bidders will be returned.

9 - CONTRACT TIMES

9.1 The number of days within which, or the dates by which, the Work is to be (a) Substantially Completed and (b) also completed and ready for final payment are set forth in the Agreement.

10 - LIQUIDATED DAMAGES

10.1 Provisions for liquidated damages, if any, are set forth in the Agreement (Section 6.3 of Performance Bond).

11 - SUBSTITUTE AND "OR-EQUAL" ITEMS

11.1 The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration of possible substitute or "or-equal" items. Whenever it is specified or described in the Bidding Documents that a substitute or "or-equal" item of material or equipment may be furnished or used by CONTRACTOR if acceptable to OWNER, application for such

acceptance will not be considered by OWNER until after the Effective Date of the Agreement. The procedure for submission of any such application by CONTRACTOR and consideration by OWNER is set forth in the General Conditions and may be supplemented in the General Requirements.

12 - SUBCONTRACTORS, SUPPLIERS, AND OTHERS

12.1 If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, individuals, or entities to be submitted to OWNER in advance of a specified date prior to the Effective Date of the Agreement, the apparent Successful Bidder, and any other Bidder so requested, shall within five days after Bid opening, submit to OWNER a list of all such Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work for which such identification is required. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, individual, or entity if requested by OWNER. If OWNER, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, OWNER may, before the Notice of Award is given, request apparent Successful Bidder to submit a substitute, without an increase in the Bid.

12.2 If apparent Successful Bidder declines to make any such substitution, OWNER may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers, individuals, or entities. Declining to make requested substitutions will not constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which OWNER makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to OWNER subject to revocation of such acceptance after the Effective Date of the Agreement.

12.3 CONTRACTOR shall not be required to employ any Subcontractor, Supplier, individual, or entity against whom CONTRACTOR has reasonable objection.

13 - PREPARATION OF BID

13.1 The Bid form is included with the Bidding Documents.

13.2 All blanks on the Bid form shall be completed by clearly printing in ink or by typewriter and the Bid signed.

13.3 A Bid by a corporation shall be executed in the corporate name by the president or a vice-president or other corporate officer accompanied by evidence of authority to sign. The corporate seal shall be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown below the signature.

13.4 A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership shall be shown below the signature.

13.5 A Bid by a limited liability company shall be executed in the name of the firm by a member and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm must be shown below the signature.

13.6 A Bid by an individual shall show the Bidder's name and official address.

13.7 A Bid by a joint venture shall be executed by each joint venturer in the manner indicated on the Bid form. The official address of the joint venture must be shown below the signature.

13.8 All names shall be typed or clearly printed in ink below the signatures.

13.9 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid form.

13.10 The address, telephone number, and email address for communications regarding the Bid shall be shown.

13.11 The Bid shall contain evidence of Bidder's authority and qualification to do business in the state where the Project is located or covenant to obtain such qualification prior to award of the Contract. Bidder's state contractor license number for the state of the Project, if any, shall also be shown on the Bid form.

14 - BASIS OF BID; EVALUATION OF BIDS

14.1 Lump Sum

A. Bidders shall submit a Lump Sum price for the total project per plans and specifications.

B. Discrepancies between words and figures will be resolved in favor of the words.

14.2 The Bid price shall include such amounts as the Bidder deems proper for overhead and profit on account of cash allowances, if any, named in the Contract Documents.

15 - SUBMITTAL OF BID

15.1 Each prospective Bidder will be furnished with one copy of the Bidding Documents.

15.2 For consideration, a Bid shall be submitted no later than the date and time prescribed and at the place indicated in the bid advertisement and shall be enclosed in an opaque sealed envelope plainly marked with "**BID #2024-01 CDBG EAST OF WURZBACH SEWER MAIN**", the name and address of Bidder, and shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate envelope plainly marked on the outside with the notation "**BID ENCLOSED**". A mailed Bid shall be addressed to:

City of Leon Valley
Office of the Public Works
6400 El Verde
Leon Valley, TX 78238

16 - MODIFICATION AND WITHDRAWAL OF BID

16.1 Once a Bid is submitted, it may be withdrawn or retrieved for the purpose of modification prior to the deadline date and time. If a Bid is retrieved for modification, it is the Bidders responsibility to make sure the bid is properly sealed and labeled and resubmitted prior to the deadline.

16.2 If within 24 hours after Bids are opened any Bidder provides a duly signed written notice with OWNER and promptly thereafter demonstrates to the reasonable satisfaction of OWNER that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, that Bidder will be disqualified from further bidding on the Work.

17 - OPENING OF BIDS

17.1 Bids will be opened at the time and place indicated in the advertisement or invitation to Bid and, unless obviously non-responsive, read aloud publicly.

18 - BIDS TO REMAIN SUBJECT TO ACCEPTANCE

18.1 All Bids will remain subject to acceptance for the period of time stated in the Bid form.

19 - AWARD OF CONTRACT

19.1 OWNER reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. OWNER further reserves the right to reject the Bid of any Bidder whom it finds, after reasonable inquiry and evaluation, to be non-responsible. OWNER may also reject the Bid of any Bidder if OWNER believes that it would not be in the best interest of the Project to make an award to that Bidder. OWNER also reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate contract terms with the Successful Bidder.

19.2 More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.

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

19.4 In evaluating Bidders, OWNER will consider the qualifications of Bidders and the qualifications and experience of Subcontractors, Suppliers, and other individuals or entities proposed for those portions of the Work for which the identity of Subcontractors, Suppliers, and other individuals or entities must be submitted.

19.5 OWNER may conduct such investigations as OWNER deems necessary to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers, individuals, or entities to perform the Work in accordance with the Contract Documents.

19.6 City Council will either reject any or all bid or award the contract to the lowest responsible bidder or to the bidder who provides goods or services at the best value for the municipality.

20 - CONTRACT SECURITY AND INSURANCE

20.1 When the Successful Bidder delivers the executed Agreement to OWNER, it must be accompanied by such Bonds and certificates of insurance.

21 - SIGNING OF AGREEMENT

21.1 When OWNER gives a Notice of Award to the Successful Bidder, it shall be accompanied by the required number of unsigned counterparts of the Agreement with the other Contract Documents which are identified in the Agreement as attached thereto. Within 15 days thereafter, Successful Bidder shall sign and deliver the required number of counterparts of the Agreement and attached documents to OWNER. Within ten days thereafter, OWNER shall deliver one fully signed counterpart to Successful Bidder with a complete set of the Drawings with appropriate identification.

22 - SALES AND USE TAXES

22.1 The City is an exempt entity for the purpose of sale tax.

A. The purchase of tangible personal property or a taxable service for this project is exempt from sales tax to the extent allowed by Title 34, Texas Administration Code §3.291.

B. Bidders must include all applicable taxes in their cost of their work.

C. Exemption notice will be provided upon request.

23 - RETAINAGE

23.1 Provisions concerning CONTRACTOR's rights to deposit securities in lieu of retainage are set forth in the Agreement.

24 - CONTRACTS TO BE ASSIGNED

24.1 Bidders may examine the documents for these contracts at the Issuing Office.

25 - PARTNERING

25.1 OWNER does not intend to participate in a partnering process with CONTRACTOR.

SECTION 3 SCOPE OF WORK

1. Description of Work

1.1. BID #2024-01 CDBG EAST OF WURZBACH SEWER MAIN

1.1.1. **Base Bid**: The proposed project involves sanitary sewer main improvements. The proposal includes 527 LF of cured-in-place pipe sewer main, 10 LF point repair with trench repair, and the rehabilitation of 20 VF of existing manholes.

SECTION 4 PROJECT SPECIFICATIONS AND SPECIAL PROVISIONS

1. Unless otherwise noted, modified by this section, or directed by the ENGINEER, all materials and methods of construction shall be in accordance with City of San Antonio, San Antonio Water System and TxDOT Standard Specifications for Construction (most current edition) and associated special provisions.
2. City of San Antonio, San Antonio Water System and TxDOT Standard Specifications for Construction and associated Special Provisions are made a part of this section by reference. It is the responsibility of all bidders to be familiar with these documents prior to submitting a bid. All items are available online at:

<http://www.sanantonio.gov/TCI/CurrentVendorResources/StandardSpecificationsandDetails.aspx>

<http://www.saws.org/>

<https://www.dot.state.tx.us/business/specifications.htm>

2.1.1 Special Specification

Add Item **Technical Specification, Section TS** included in **ATTACHMENT M**

3. All spoil materials salvaged by operations shall become the property of the contractor. Reuse for subsequent items in this contract will require the prior approval of the Engineer.
4. Unless specifically identified with a pay item, excavation and the removal of existing materials shall be considered unclassified excavation and subsidiary to completion of the project.
5. The contractor shall secure TPDES permits prior to mobilization. In addition to measures provided for in the permit, the Contractor also shall provide silt fence, sediment traps and other Sediment Control measures as directed by the ENGINEER. All sediment control measures and cleaning of existing streets impacted by the contractor's work shall be subsidiary to completion of the project.
6. Temporary Traffic Control shall conform to Part 6, Texas Manual on Uniform Traffic Control Devices (TMUTCD), current edition. (No Separate Pay).
7. All questions received in accordance with the email provisions (Instructions to Bidders, 7.1) by 12:00 pm the day prior to the Pre-Bid Conference will be addressed at the conference. An addendum will be issued subsequent to the Pre-Bid Conference that will address these and other questions that arise at the conference.

SECTION 5 GENERAL CONDITIONS

1 - DEFINITIONS

Defined Terms – Wherever used in the Contract Documents and printed with initial or all capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof.

- A. Addenda--Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the Contract Documents.
- B. Agreement--The written instrument which is evidence of the agreement between OWNER and CONTRACTOR covering the Work.
- C. Application for Payment--The form acceptable to OWNER which is to be used by CONTRACTOR during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
- D. Asbestos--Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.
- E. Bid--The offer or proposal of a bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
- F. Bidding Documents--The Bidding Requirements and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids).
- G. Bidding Requirements--The Advertisement or Invitation to Bid, Instructions to Bidders, Bid security form, if any, and the Bid form with any supplements.
- H. Bonds--Performance and payment bonds and other instruments of security.
- I. Change Order--A document recommended by OWNER which is signed by CONTRACTOR and OWNER and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.
- J. Claim--A demand or assertion by OWNER or CONTRACTOR seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.
- K. Contract--The entire and integrated written agreement between the OWNER and CONTRACTOR concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.
- L. Contract Documents--The Contract Documents establish the rights and obligations of the parties and include the Agreement, Addenda (which pertain to the Contract Documents), CONTRACTOR's Bid (including documentation accompanying the Bid and any post Bid documentation submitted prior to the Notice of Award) when

attached as an exhibit to the Agreement, the Notice to Proceed, the Bonds, these General Conditions, the Supplementary Conditions, the Specifications and the Drawings as the same are more specifically identified in the Agreement, together with all Written Amendments, Change Orders, Work Change Directives, Field Orders, and OWNER's written interpretations and clarifications issued on or after the Effective Date of the Agreement. Approved Shop Drawings and the reports and drawings of subsurface and physical conditions are not Contract Documents. Only printed or hard copies of the items listed in this paragraph are Contract Documents. Files in electronic media format of text, data, graphics, and the like that may be furnished by OWNER to CONTRACTOR are not Contract Documents.

M. Contract Price--The moneys payable by OWNER to CONTRACTOR for completion of the Work in accordance with the Contract Documents as stated in the Agreement.

N. Contract Times--The number of days or the dates stated in the Agreement to: (i) achieve Substantial Completion; and (ii) complete the Work so that it is ready for final payment as evidenced by OWNER's approval of final payment.

O. CONTRACTOR--The individual or entity with whom OWNER has entered into the Agreement.

P. Drawings--That part of the Contract Documents prepared or approved by OWNER which graphically shows the scope, extent, and character of the Work to be performed by CONTRACTOR. Shop Drawings and other CONTRACTOR submittals are not Drawings as so defined.

Q. Effective Date of the Agreement--The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

R. OWNER's Consultant--An individual or entity having a contract with OWNER to furnish services as OWNER's independent professional associate or consultant with respect to the Project and who is identified as such in the Supplementary Conditions.

S. Field Order--A written order issued by OWNER which requires minor changes in the Work, but which does not involve a change in the Contract Price or the Contract Times.

T. Hazardous Environmental Condition--The presence at the Site of Asbestos, PCBs, Petroleum,

U. Hazardous Waste or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto in connection with the Work.

V. Hazardous Waste--The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

- W. Laws and Regulations; Laws or Regulations-- Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
- X. Liens--Charges, security interests, or encumbrances upon Project funds, real property, or personal property.
- Y. Milestone--A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.
- Z. Notice of Award--The written notice by OWNER to the apparent successful bidder stating that upon timely compliance by the apparent successful bidder with the conditions precedent listed therein, OWNER will sign and deliver the Agreement.
- AA. Notice to Proceed--A written notice given by OWNER to CONTRACTOR fixing the date on which the Contract Times will commence to run and on which CONTRACTOR shall start to perform the Work under the Contract Documents.
- BB. OWNER--The individual, entity, public body, or authority with whom CONTRACTOR has entered into the Agreement and for whom the Work is to be performed.
- CC. Partial Utilization--Use by OWNER of a substantially completed part of the Work for the purpose for which it is intended (or a related purpose) prior to Substantial Completion of all the Work.
- DD. PCBs--Polychlorinated biphenyls.
- EE. Petroleum-- Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.
- FF. Project--The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part as may be indicated elsewhere in the Contract Documents.
- GG. Project Manual--The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.
- HH. Radioactive Material--Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.
- II. Resident Project Representative--The authorized representative of OWNER who may be assigned to the Site or any part thereof.
- JJ. Samples--Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

KK. Shop Drawings--All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for CONTRACTOR and submitted by CONTRACTOR to illustrate some portion of the Work.

LL. Site--Lands or areas indicated in the Contract Documents as being furnished by OWNER upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by OWNER which are designated for the use of CONTRACTOR.

MM. Specifications--That part of the Contract Documents consisting of written technical descriptions of materials, equipment, systems, standards, and workmanship as applied to the Work and certain administrative details applicable thereto.

NN. Subcontractor--An individual or entity having a direct contract with CONTRACTOR or with any other Subcontractor for the performance of a part of the Work at the Site.

OO. Substantial Completion--The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of OWNER, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

PP. Supplementary Conditions--That part of the Contract Documents which amends or supplements these General Conditions.

QQ. Supplier--A manufacturer, fabricator, supplier, distributor, material man, or vendor having a direct contract with CONTRACTOR or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by CONTRACTOR or any Subcontractor.

RR. Underground Facilities--All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

SS. Unit Price Work--Work to be paid for on the basis of unit prices.

TT. Work--The entire completed construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

UU. Work Change Directive--A written statement to CONTRACTOR issued on or after the Effective Date of the Agreement and signed by OWNER ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A

Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

VV. Written Amendment--A written statement modifying the Contract Documents, signed by OWNER and CONTRACTOR on or after the Effective Date of the Agreement and normally dealing with the non-engineering or nontechnical rather than strictly construction-related aspects of the Contract Documents.

2 - TERMINOLOGY

A. Intent of Certain Terms or Adjectives

1. Whenever in the Contract Documents the terms “as allowed,” “as approved,” or terms of like effect or import are used, or the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of OWNER as to the Work, it is intended that such action or determination will be solely to evaluate, in general, the completed Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective shall not be effective to assign to OWNER any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of the Contract Documents.

B. Day -- The word “day” shall constitute a calendar day of 24 hours measured from midnight to the next midnight.

C. Defective -- The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it does not conform to the Contract Documents or does not meet the requirements of any inspection, reference standard, test, or approval referred to in the Contract Documents, or has been damaged prior to OWNER’s approval of final payment (unless responsibility for the protection thereof has been assumed by OWNER at Substantial Completion).

D. Furnish, Install, Perform, Provide

1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. When “furnish,” “install,” “perform,” or “provide” is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of CONTRACTOR, “provide” is implied.

E. Unless stated otherwise in the Contract Documents, words or phrases which have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

3 - PRELIMINARY MATTERS

3.1 Delivery of Bonds

A. When CONTRACTOR delivers the executed Agreements to OWNER, CONTRACTOR shall also deliver to OWNER such Bonds as CONTRACTOR may be required to furnish.

3.2 Copies of Documents

A. OWNER shall furnish to CONTRACTOR up to two copies of the Contract Documents. Additional copies will be furnished upon request at the cost of reproduction.

3.3 Commencement of Contract Times; Notice to Proceed

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

3.4 Starting the Work

A. CONTRACTOR shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

3.5 Before Starting Construction

A. CONTRACTOR’s Review of Contract Documents: Before undertaking each part of the Work, CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. CONTRACTOR shall promptly report in writing to OWNER any conflict, error, ambiguity, or discrepancy which CONTRACTOR may discover and shall obtain a written interpretation or clarification from OWNER before proceeding with any Work affected thereby; however, CONTRACTOR shall not be liable to OWNER for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless CONTRACTOR knew or reasonably should have known thereof.

B. Preliminary Schedules: Within ten days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), CONTRACTOR shall submit to OWNER for its timely review:

1. a preliminary progress schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;
2. a preliminary schedule of Shop Drawing and Sample submittals which will list each required submittal and the times for submitting, reviewing, and processing such submittal; and
3. a preliminary schedule of values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

C. Evidence of Insurance: Before any Work at the Site is started, CONTRACTOR and OWNER shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which CONTRACTOR and OWNER respectively are required to purchase and maintain.

D. The CONTRACTOR shall be responsible for the notifying all property owners within and adjacent to the project twenty-four (24) hours prior to commencing construction operations. Said notice shall be in writing and in a form acceptable to the OWNER.

E. Prior to the start of the project, the CONTRACTOR shall identify to the OWNER, any tree limbs which overly and interfere with the work. Said limbs are to be removed by the OWNER.

3.6 Preconstruction Conference

A. Within 20 days after the Contract Times start to run, but before any Work at the Site is started, a conference attended by CONTRACTOR, OWNER, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules, procedures, processing Applications for Payment, and maintaining required records.

3.7 Initial Acceptance of Schedules

A. Unless otherwise provided in the Contract Documents, at least ten days before submission of the first Application for Payment a conference attended by CONTRACTOR, OWNER, and others as appropriate will be held to review for acceptability to OWNER as provided below the schedules submitted. CONTRACTOR shall have an additional ten days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to CONTRACTOR until acceptable schedules are submitted to OWNER.

1. The progress schedule will be acceptable to OWNER if it provides an orderly progression of the Work to completion within any specified Milestones and the Contract Times. Such acceptance will not impose on OWNER responsibility for the progress schedule, for sequencing, scheduling, or progress of the Work nor interfere with or relieve CONTRACTOR from CONTRACTOR's full responsibility therefor.
2. CONTRACTOR's schedule of values will be acceptable to OWNER as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

4 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

4.1 Intent

- A. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.
- B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be provided whether or not specifically called for at no additional cost to OWNER.
- C. Clarifications and interpretations of the Contract Documents shall be issued by OWNER.

4.2 Reference Standards

- A. Standards, Specifications, Codes, Laws, and Regulations
 1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
 2. No provision of any such standard, specification, manual or code, or any instruction of a Supplier shall be effective to change the duties or responsibilities of OWNER or CONTRACTOR, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents, nor shall any such provision or instruction be effective to assign to OWNER, or any of OWNER's Consultants, agents, or employees any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

4.3 Reporting and Resolving Discrepancies

A. Reporting Discrepancies

1. If, during the performance of the Work, CONTRACTOR discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any Law or Regulation applicable to the performance of the Work or of any standard, specification, manual or code, or of any instruction of any Supplier, CONTRACTOR shall report it to OWNER in writing at once. CONTRACTOR shall not proceed with the Work affected thereby (except in an emergency) until an amendment or supplement to the Contract Documents has been issued; provided, however, that CONTRACTOR shall not be liable to OWNER for failure to report any such conflict, error, ambiguity, or discrepancy unless CONTRACTOR knew or reasonably should have known thereof.

B. Resolving Discrepancies

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between or the provisions of the Contract Documents and:

a. the provisions of any Laws or Regulations

b. the provisions of any standard, specification, applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

4.4 Amending and Supplementing Contract Documents

A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways: (i) a Written Amendment; (ii) a Change Order; or (iii) a Work Change Directive.

B. The requirements of the Contract Documents may be supplemented and minor variations and deviations in the Work may be authorized, by one or more of the following ways: (i) a Field Order; (ii) OWNER's approval of a Shop Drawing or Sample; or (iii) OWNER's written interpretation or clarification.

4.5 Reuse of Documents

A. CONTRACTOR and any Subcontractor or Supplier or other individual or entity performing or furnishing any of the Work under a direct or indirect contract with OWNER:

1. shall not have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of OWNER or OWNER's Consultant, including electronic media editions; and

2. shall not reuse any of such Drawings, Specifications, manual, code, or instruction (whether or not specifically incorporated by reference in the

Contract Documents); other documents, or copies thereof on extensions of the Project or any other project without written consent of OWNER and specific written verification or adaption by OWNER. This prohibition will survive final payment, completion, and acceptance of the Work, or termination or completion of the Contract. Nothing herein shall preclude CONTRACTOR from retaining copies of the Contract Documents for record purposes.

5 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS

5.1 Availability of Lands

A. OWNER shall furnish the Site. OWNER shall notify CONTRACTOR of any encumbrances or restrictions not of general application but specifically related to use of the Site with which CONTRACTOR must comply in performing the Work. OWNER will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If CONTRACTOR and OWNER are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in OWNER's furnishing the Site, CONTRACTOR may make a Claim.

B. CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

C. The CONTRACTOR shall not, except after written consent from proper parties, enter or occupy with men, tools, materials or equipment, any privately-owned land except on easements provided herein.

5.2 Subsurface and Physical Conditions

A. In the preparation of Drawings and Specifications, Owner relied upon the following report of explorations and tests of the subsurface conditions at the site: **NONE**.

B. Notice: If CONTRACTOR believes that any subsurface or physical condition at or contiguous to the Site that is uncovered or revealed either:

1. is of such a nature as to establish that any "technical data" on which CONTRACTOR is entitled is materially inaccurate; or
2. is of such a nature as to require a change in the Contract Documents; or
3. differs materially from that shown or indicated in the Contract Documents; or
4. is of an unusual nature and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents; then CONTRACTOR shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency), notify OWNER in writing about such condition. CONTRACTOR shall not further disturb such condition or perform any Work in

connection therewith (except as aforesaid) until receipt of written order to do so.

C. OWNER's Review: After receipt of written notice, OWNER will promptly review the pertinent condition, determine the necessity of OWNER's obtaining additional exploration or tests with respect thereto, and advise CONTRACTOR in writing of OWNER's findings and conclusions.

D. Possible Price and Times Adjustments

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in CONTRACTOR's cost of, or time required for performance of the Work.

2. CONTRACTOR shall not be entitled to any adjustment in the Contract Price or Contract Times if:

a. CONTRACTOR knew of the existence of such conditions at the time CONTRACTOR made a final commitment to OWNER in respect of Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or

b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for CONTRACTOR prior to CONTRACTOR's making such final commitment; or

c. CONTRACTOR failed to give the written notice within the required time.

3. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made. However, OWNER and OWNER's Consultants shall not be liable to CONTRACTOR for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by CONTRACTOR on or in connection with any other project or anticipated project.

5.4 Hazardous Environmental Conditions at Site

A. CONTRACTOR shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. CONTRACTOR shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by CONTRACTOR, Subcontractors, Suppliers, or anyone else for whom CONTRACTOR is responsible.

B. If CONTRACTOR encounters a Hazardous Environmental Condition or if CONTRACTOR or anyone for whom CONTRACTOR is responsible creates a Hazardous Environmental Condition, CONTRACTOR shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency); and (iii) notify OWNER (and promptly thereafter confirm such notice in writing). OWNER shall promptly consult with OWNER'S Consultants concerning the necessity for OWNER to retain a qualified expert to evaluate such condition or take corrective action, if any.

C. CONTRACTOR shall not be required to resume Work in connection with such condition or in any affected area until after OWNER has obtained any required permits related thereto and delivered to CONTRACTOR written notice: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If OWNER and CONTRACTOR cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by CONTRACTOR, either party may make a Claim.

D. If after receipt of such written notice CONTRACTOR does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then OWNER may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If OWNER and CONTRACTOR cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim. OWNER may have such deleted portion of the Work performed by OWNER's own forces or others.

E. To the fullest extent permitted by Laws and Regulations, OWNER shall indemnify and hold harmless CONTRACTOR, Subcontractors, OWNER's Consultants and the officers, directors, partners, employees, agents, other consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work; and (ii) was not created by CONTRACTOR or by anyone for whom CONTRACTOR is responsible. Nothing shall obligate OWNER to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

F. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, OWNER's Consultants, and the officers, directors, partners, employees, agents, other consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental

Condition created by CONTRACTOR or by anyone for whom CONTRACTOR is responsible. Nothing shall obligate CONTRACTOR to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

5.5 Damage to Existing Streets

A. The asphalt pavement, curbs and existing sidewalks adjacent to the work area are considered to be in good to excellent condition prior to the start of the project.

B. Any scars, nicks, gasoline, oil, etc., or other defacement or damage to the existing streets, curbs, or sidewalks will be the responsibility of the CONTRACTOR to repair. Before beginning the job, the CONTRACTOR may point out and note to the inspector any specific areas that are already damaged. Thereafter, the CONTRACTOR will not be held responsible for repairs to these areas.

6 - BONDS AND INSURANCE

6.1 Performance, Payment, and Other Bonds

A. CONTRACTOR shall furnish performance and payment Bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all CONTRACTOR's obligations under the Contract Documents. These Bonds shall remain in effect at least until one year after the date when final payment becomes due, except as provided otherwise by Laws or Regulations or by the Contract Documents. CONTRACTOR shall also furnish such other Bonds as are required by the Contract Documents.

B. All Bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All Bonds signed by an agent must be accompanied by a certified copy of such agent's authority to act.

C. If the surety on any Bond furnished by CONTRACTOR is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements, CONTRACTOR shall within 20 days thereafter substitute another Bond and surety, both of which shall comply with the requirements.

6.2 Licensed Sureties and Insurers

A. All Bonds and insurance required by the Contract Documents to be purchased and maintained by OWNER or CONTRACTOR shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue Bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall

also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

6.3 Certificates of Insurance

A. CONTRACTOR shall deliver to OWNER, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by OWNER or any other additional insured) which CONTRACTOR is required to purchase and maintain. OWNER shall deliver to CONTRACTOR, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by CONTRACTOR or any other additional insured) which OWNER is required to purchase and maintain.

6.4 CONTRACTOR's Liability Insurance

A. CONTRACTOR shall purchase and maintain such liability and other insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from CONTRACTOR's performance of the Work and CONTRACTOR's other obligations under the Contract Documents, whether it is to be performed by CONTRACTOR, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;
2. claims for damages because of bodily injury, occupational sickness or disease, or death of CONTRACTOR's employees;
3. claims for damages because of bodily injury, sickness or disease, or death of any person other than CONTRACTOR's employees;
4. claims for damages insured by reasonably available personal injury liability coverage which are sustained: (i) by any person as a result of an offense directly or indirectly related to the employment of such person by CONTRACTOR, or (ii) by any other person for any other reason;
5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and
6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

B. The policies of insurance so required to be purchased and maintained shall:

1. with respect to insurance required, include as additional insured (subject to any customary exclusion in respect of professional liability) OWNER, OWNER's Consultants, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insured,

and include coverage for the respective officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of all such additional insured, and the insurance afforded to these additional insured shall provide primary coverage for all claims covered thereby;

2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;

3. include completed operations insurance;

4. include contractual liability insurance covering CONTRACTOR's indemnity obligations;

5. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least thirty days prior written notice has been given to OWNER and CONTRACTOR and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the CONTRACTOR will so provide);

6. remain in effect at least until final payment and at all times thereafter when CONTRACTOR may be correcting, removing, or replacing defective Work in accordance with; and

7. with respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least two years after final payment (and CONTRACTOR shall furnish OWNER and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to OWNER and any such additional insured of continuation of such insurance at final payment and one year thereafter).

6.5 OWNER's Liability Insurance

A. In addition to the insurance required to be provided by CONTRACTOR, OWNER, at OWNER's option, may purchase and maintain at OWNER's expense OWNER's own liability insurance as will protect OWNER against claims which may arise from operations under the Contract Documents.

6.6 Property Insurance

A. Unless otherwise provided in the Supplementary Conditions, OWNER shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

1. include the interests of OWNER, CONTRACTOR, Subcontractors, OWNER's Consultants, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them,

each of whom is deemed to have an insurable interest and shall be listed as an additional insured;

2. be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, false work, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage, and such other perils or causes of loss as may be specifically required by the Supplementary Conditions;

3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by OWNER prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by OWNER;

5. allow for partial utilization of the Work by OWNER;

6. include testing and startup; and be maintained in effect until final payment is made unless otherwise agreed to in writing by OWNER and CONTRACTOR with 30 days written notice to each other additional insured to whom a certificate of insurance has been issued.

B. OWNER shall purchase and maintain such boiler and machinery insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of OWNER, CONTRACTOR, Subcontractors, OWNER's Consultants, and any other individuals or entities identified in the Supplementary Conditions, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured.

C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to OWNER and CONTRACTOR and to each other additional insured to whom a certificate of insurance has been issued and will contain waiver provisions.

D. OWNER shall not be responsible for purchasing and maintaining any property insurance specified to protect the interests of CONTRACTOR, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by CONTRACTOR, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

E. If CONTRACTOR requests in writing that other special insurance be included in the property insurance policies provided, OWNER shall, if possible, include such insurance, and the cost thereof will be charged to CONTRACTOR by appropriate Change Order or Written Amendment. Prior to commencement of the Work at the Site, OWNER shall in writing advise CONTRACTOR whether or not such other insurance has been procured by OWNER.

6.7 Waiver of Rights

A. OWNER and CONTRACTOR intend that all policies purchased will protect OWNER, CONTRACTOR, Subcontractors, OWNER's Consultants, and all other individuals or entities identified in the Supplementary Conditions to be listed as insured or additional insured (and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insured or additional insured thereunder. OWNER and CONTRACTOR waive all rights against each other and their respective officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors, OWNER's Consultants, and all other individuals or entities identified in the Supplementary Conditions to be listed as insured or additional insured (and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by OWNER as trustee or otherwise payable under any policy so issued.

B. OWNER waives all rights against CONTRACTOR, Subcontractors, OWNER's Consultants, and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them for:

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to OWNER's property or the Work caused by, arising out of, or resulting from fire or other peril whether or not insured by OWNER; and
2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by OWNER during partial utilization, after Substantial Completion, or after final payment.

C. Any insurance policy maintained by OWNER covering any loss, damage or consequential loss shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against CONTRACTOR, Subcontractors, or OWNER's Consultants and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them.

6.8 Receipt and Application of Insurance Proceeds

A. Any insured loss under the policies of insurance required will be adjusted with OWNER and made payable to OWNER as fiduciary for the insured, as their interests may appear, subject to the requirements of any applicable mortgage clause. OWNER shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order or Written Amendment.

B. OWNER as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to OWNER's exercise of this power. If such objection be made, OWNER as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, OWNER as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, OWNER as fiduciary shall give bond for the proper performance of such duties.

6.9 Acceptance of Bonds and Insurance; Option to Replace

A. If either OWNER or CONTRACTOR has any objection to the coverage afforded by or other provisions of the Bonds or insurance required to be purchased and maintained by the other party on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested). OWNER and CONTRACTOR shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the Bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent Bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

6.10 Partial Utilization, Acknowledgment of Property Insurer

A. If OWNER finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, no such use or occupancy shall commence before the insurers providing the property insurance have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

6.11 Warranty

The Contractor shall warrant the work performed against defect in materials and workmanship for a period of one year after acceptance by the Owner. Warranty work will be performed by the Contractor within a reasonable time of notice given by the Owner. Owner reserves the right to make repairs at the Contractor's expense upon the failure of the Contractor to respond promptly. Repairs under the warranty will carry an additional 90-day warranty period. The Warranty period shall commence at the time the City has made final acceptance of the work done by the Contractor. The City will assume responsibility for damage to the facility caused by misuse and vandalism after final acceptance.

7 - CONTRACTOR'S RESPONSIBILITIES

7.1 Supervision and Superintendence

A. CONTRACTOR shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction, but CONTRACTOR shall not be responsible for the negligence of OWNER in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents. CONTRACTOR shall be responsible to see that the completed Work complies accurately with the Contract Documents.

B. At all times during the progress of the Work, CONTRACTOR shall assign a competent resident superintendent thereto who shall not be replaced without written notice to OWNER except under extraordinary circumstances. The superintendent will be CONTRACTOR's representative at the Site and shall have authority to act on behalf of CONTRACTOR. All communications given to or received from the superintendent shall be binding on CONTRACTOR.

7.2 Labor; Working Hours

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

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, and CONTRACTOR will not permit overtime work or the performance of Work on Saturday, Sunday, or any legal holiday without OWNER's written consent (which will not be unreasonably withheld) given after prior written notice to OWNER.

7.3 Services, Materials, and Equipment

A. Unless otherwise specified in the General Requirements, CONTRACTOR shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances,

fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.

B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All warranties and guarantees specifically called for by the Specifications shall expressly run to the benefit of OWNER. If required by OWNER, CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.4 Progress Schedule

A. CONTRACTOR shall adhere to the progress schedule established as it may be adjusted from time to time as provided below.

1. CONTRACTOR shall submit to OWNER for acceptance proposed adjustments in the progress schedule that will not result in changing the Contract Times (or Milestones). Such adjustments will conform generally to the progress schedule then in effect and additionally will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the progress schedule that will change the Contract Times (or Milestones) shall be submitted in accordance with the requirements. Such adjustments may only be made by a Change Order or Written Amendment.

7.5 Substitutes and "Or-Equals"

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to OWNER for review under the circumstances described below.

1. "Or-Equal" Items: If in OWNER's sole discretion an item of material or equipment proposed by CONTRACTOR is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by OWNER as an "or-equal" item, in which case review and approval of the proposed item may, in OWNER's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. A proposed item of material or equipment will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment OWNER determines that: (i) it is at least equal in quality, durability, appearance, strength, and design

characteristics; (ii) it will reliably perform at least equally well the function imposed by the design concept of the completed Project as a functioning whole, and;

b. CONTRACTOR certifies that: (i) there is no increase in cost to the OWNER; and (ii) it will conform substantially, even with deviations, to the detailed requirements of the item named in the Contract Documents.

2. Substitute Items

a. If in OWNER's sole discretion an item of material or equipment proposed by CONTRACTOR does not qualify as an "or-equal" item, it will be considered a proposed substitute item.

b. CONTRACTOR shall submit sufficient information as provided below to allow OWNER to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by OWNER from anyone other than CONTRACTOR.

c. The procedure for review by OWNER will be as set forth as supplemented in the General Requirements and as OWNER may decide is appropriate under the circumstances.

d. CONTRACTOR shall first make written application to OWNER for review of a proposed substitute item of material or equipment that CONTRACTOR seeks to furnish or use. The application shall certify that the proposed substitute item will perform adequately the functions and achieve the results called for by the general design, be similar in substance to that specified, and be suited to the same use as that specified. The application will state the extent, if any, to which the use of the proposed substitute item will prejudice CONTRACTOR's achievement of Substantial Completion on time, whether or not use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) to adapt the design to the proposed substitute item and whether or not incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute item from that specified will be identified in the application, and available engineering, sales, maintenance, repair, and replacement services will be indicated. The application will also contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change, all of which will be considered by OWNER in evaluating the proposed substitute item. OWNER may require CONTRACTOR to furnish additional data about the proposed substitute item.

B. Substitute Construction Methods or Procedures: If a specific means, method, technique, sequence, or procedure of construction is shown or indicated in and expressly required by the Contract Documents, CONTRACTOR may

furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by OWNER. CONTRACTOR shall submit sufficient information to allow OWNER, in OWNER's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents.

C. Owner's Evaluation: OWNER will be allowed a reasonable time within which to evaluate each proposal or submittal made. OWNER will be the sole judge of acceptability. No "or-equal" or substitute will be ordered, installed or utilized until OWNER's review is complete, which will be evidenced by either a Change Order for a substitute or an approved Shop Drawing for an "or equal." OWNER will advise CONTRACTOR in writing of any negative determination.

D. Special Guarantee: OWNER may require CONTRACTOR to furnish at CONTRACTOR's expense a special performance guarantee or other surety with respect to any substitute.

E. CONTRACTOR's Expense: CONTRACTOR shall provide all data in support of any proposed substitute or "or-equal" at CONTRACTOR's expense.

7.6 Concerning Subcontractors, Suppliers, and Others

A. CONTRACTOR shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to OWNER), whether initially or as a replacement, against whom OWNER may have reasonable objection. CONTRACTOR shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom CONTRACTOR has reasonable objection.

B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to OWNER in advance for acceptance by OWNER by a specified date prior to the Effective Date of the Agreement, and if CONTRACTOR has submitted a list thereof in accordance with the Supplementary Conditions, OWNER's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. CONTRACTOR shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued, or Written Amendment signed. No acceptance by OWNER of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of OWNER to reject defective Work.

C. CONTRACTOR shall be fully responsible to OWNER for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as CONTRACTOR is responsible for CONTRACTOR's own acts and omissions. Nothing in the Contract Documents shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between OWNER and any such Subcontractor, Supplier or other individual or entity, nor shall it create any

obligation on the part of OWNER to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

D. CONTRACTOR shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR.

E. CONTRACTOR shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with OWNER through CONTRACTOR.

F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control CONTRACTOR in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

G. All Work performed for CONTRACTOR by a Subcontractor or Supplier will be pursuant to an appropriate agreement between CONTRACTOR and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of OWNER. Whenever any such agreement is with a Subcontractor or Supplier who is listed as an additional insured on the property insurance, the agreement between the CONTRACTOR and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against OWNER, CONTRACTOR, OWNER's Consultants, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, CONTRACTOR will obtain the same.

7.7 Laws and Regulations

A. CONTRACTOR shall give all notices and comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, OWNER shall not be responsible for monitoring CONTRACTOR's compliance with any Laws or Regulations.

B. If CONTRACTOR performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, CONTRACTOR shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work; however, it shall not be CONTRACTOR's primary responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve CONTRACTOR of CONTRACTOR's obligations.

C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work may be the subject of an adjustment in Contract Price or Contract Times. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made.

7.8 Taxes

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

7.9 Use of Site and Other Areas

A. Limitation on Use of Site and Other Areas

1. CONTRACTOR shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. CONTRACTOR shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

2. Should any claim be made by any such owner or occupant because of the performance of the Work, CONTRACTOR shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

3. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, OWNER's Consultant, and the officers, directors, partners, employees, agents, and other consultants of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against OWNER, or any other party indemnified hereunder to the extent caused by or based upon CONTRACTOR's performance of the Work.

B. Removal of Debris During Performance of the Work: During the progress of the Work CONTRACTOR shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. Cleaning: Prior to Substantial Completion of the Work CONTRACTOR shall clean the Site and make it ready for utilization by OWNER. At the completion of the Work CONTRACTOR shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to

original condition all property not designated for alteration by the Contract Documents.

7.10 Record Documents

A. CONTRACTOR shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Written Amendments, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to OWNER for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to OWNER.

7.11 Safety and Protection

A. CONTRACTOR shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. CONTRACTOR shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. all persons on the Site or who may be affected by the Work;
2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. CONTRACTOR shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. CONTRACTOR shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property. All damage, injury, or loss to any property caused, directly or indirectly, in whole or in part, by CONTRACTOR, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by CONTRACTOR (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of OWNER or OWNER's Consultant, or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of CONTRACTOR or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them). CONTRACTOR's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and OWNER has issued a notice to OWNER and CONTRACTOR that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

7.12 Safety Representative

A. CONTRACTOR shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

7.13 Hazard Communication Programs

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

7.14 Emergencies

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

7.15 Continuing the Work

A. CONTRACTOR shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with OWNER. No work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted or as OWNER and CONTRACTOR may otherwise agree in writing.

7.16 CONTRACTOR's General Warranty and Guarantee

A. CONTRACTOR warrants and guarantees to OWNER, and OWNER's Consultants that all Work will be in accordance with the Contract Documents and will not be defective for a 12-month period beginning on the date of the final payment. CONTRACTOR's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than CONTRACTOR, Subcontractors, Suppliers, or any other individual or entity for whom CONTRACTOR is responsible; or
2. normal wear and tear under normal usage.

B. CONTRACTOR's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of CONTRACTOR's obligation to perform the Work in accordance with the Contract Documents:

1. observations by OWNER;
2. recommendation by OWNER or payment by OWNER of any progress or final payment;
3. the issuance of a certificate of Substantial Completion by OWNER or any payment related thereto by OWNER;
4. use or occupancy of the Work or any part thereof by OWNER;
5. any acceptance by OWNER or any failure to do so;
6. any review and approval of a Shop Drawing or Sample submittal or the issuance of a Notice of Acceptability by OWNER;
7. any inspection, test, or approval by others; or
8. any correction of defective Work by OWNER.

7.17 Indemnification

To the fullest extent permitted by law the contractor shall indemnify and hold harmless the owner, and agents and employees of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the work itself), but only to the extent caused by the negligent acts or omissions of the contractor, a subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person.

In claims against any person or entity indemnified under this section, by an employee of the contractor, a subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the contractor or a subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

8 - OWNER'S RESPONSIBILITIES

8.1 Communications to Contractor

- A. Except as otherwise provided in these General Conditions, OWNER shall issue all communications to CONTRACTOR directly.

8.2 Furnish Data

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

8.3 Pay Promptly When Due

A. OWNER shall make payments to CONTRACTOR within thirty (30) days of receipt of an application for payment.

8.4 Insurance

A. OWNER's responsibilities, if any, in respect to purchasing and maintaining liability and property insurance.

8.5 Change Orders

A. OWNER is obligated to execute Change Orders.

8.6 Inspections, Tests, and Approvals

A. OWNER's responsibility in respect to certain inspections, tests, and approvals.

8.7 Undisclosed Hazardous Environmental Condition

A. OWNER's responsibility in respect to an undisclosed Hazardous Environmental Condition.

8.8 Evidence of Financial Arrangements

A. If and to the extent OWNER has agreed to furnish CONTRACTOR reasonable evidence that financial arrangements have been made to satisfy OWNER's obligations under the Contract Documents, OWNER's responsibility in respect thereof will be as set forth in the Supplementary Conditions.

9 - OWNER'S STATUS DURING CONSTRUCTION

9.1 Visits to Site

A. OWNER will make visits to the Site at intervals appropriate to the various stages of construction as OWNER deems necessary in order to observe the progress that has been made and the quality of the various aspects of CONTRACTOR's executed Work. based on information obtained during such visits and observations, OWNER will determine, in general, if the Work is proceeding in accordance with the Contract Documents. OWNER will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. OWNER's efforts will be directed toward providing a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, OWNER will keep informed of the progress of the Work and will endeavor to guard themselves against defective Work.

B. OWNER's visits and observations are subject to all the limitations on OWNER's authority and responsibility, and particularly, but without limitation, during or as a result of OWNER's visits or observations of CONTRACTOR's Work OWNER will not supervise, direct, control, or have authority over or be responsible for CONTRACTOR's means, methods, techniques, sequences, or procedures of

construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the performance of the Work.

9.2 Project Representative

A. OWNER will furnish a Project Manager to assist OWNER in providing more extensive observation of the Work. The responsibilities and authority and limitations thereon of any such Project Manager and assistants will be in the Supplementary Conditions. If OWNER designates another representative or agent to represent OWNER at the Site who is not OWNER's Consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.3 Clarifications and Interpretations

A. OWNER will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents as OWNER may determine necessary, which shall be consistent with the intent of and reasonably inferable from the Contract Documents. Such written clarifications and interpretations will be binding on OWNER and CONTRACTOR. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a written clarification or interpretation, a Claim may be made.

9.4 Authorized Variations in Work

A. OWNER may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on OWNER and also on CONTRACTOR, who shall perform the Work involved promptly. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of a Field Order, a Claim may be made.

9.5 Rejecting Defective Work

A. OWNER will have authority to disapprove or reject Work which OWNER believes to be defective, or that OWNER believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. OWNER will also have authority to require special inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.

9.6 Determinations for Unit Price Work

A. OWNER will determine the approximate quantities and classifications of Unit Price Work performed by CONTRACTOR. OWNER will review with CONTRACTOR the OWNER's preliminary determinations on such matter. It will

be CONTRACTOR's responsibility to visit the sites and become familiar with the existing conditions and the scope of the project work; verify quantities and become familiar with the surrounding conditions that may affect the cost.

9.7 Decisions on Requirements of Contract Documents and Acceptability of Work

A. OWNER will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. Claims, disputes and other matters relating to the acceptability of the Work, the quantities and classifications of Unit Price Work, the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, and Claims seeking changes in the Contract Price or Contract Times will be referred initially to OWNER in writing, a request for a formal decision.

B. When functioning as interpreter and judge, OWNER or OWNER's Consultant will not be liable in connection with any interpretation or decision rendered in good faith in such capacity. The rendering of a decision by OWNER with respect to any such Claim, dispute, or other matter (except any which have been waived by the making or acceptance of final payment) will be a condition precedent to any exercise by OWNER or CONTRACTOR of such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any such Claim, dispute, or other matter.

9.8 Limitations on OWNER's Authority and Responsibilities

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

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

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

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

E. The limitations upon authority and responsibility set forth shall also apply to OWNER's Consultants, Resident Project Representative, and assistants.

10 - CHANGES IN THE WORK; CLAIMS

10.1 Authorized Changes in the Work

A. Without invalidating the Agreement and without notice to any surety, OWNER may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Written Amendment, a Change Order, or a Work Change Directive. Upon receipt of any such document, CONTRACTOR shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

B. If OWNER and CONTRACTOR are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made.

10.2 Unauthorized Changes in the Work

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

10.3 Execution of Change Orders

A. OWNER and CONTRACTOR shall execute appropriate Change Orders (or Written Amendments) covering:

1. changes in the Work which are: (i) ordered by OWNER, (ii) required because of acceptance of defective Work or OWNER's correction of defective Work, or (iii) agreed to by the parties;

2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and

3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by OWNER; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, CONTRACTOR shall carry on the Work and adhere to the progress schedule.

10.4 Notification to Surety

A. If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times) is required by the provisions of any Bond to be given to a surety,

the giving of any such notice will be CONTRACTOR's responsibility. The amount of each applicable Bond will be adjusted to reflect the effect of any such change.

10.5 Claims and Disputes

A. Notice: Written notice stating the general nature of each Claim, dispute, or other matter shall be delivered by the claimant to OWNER's Consultant and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. Notice of the amount or extent of the Claim, dispute, or other matter with supporting data shall be delivered to the OWNER's Consultant and the other party to the Contract within 60 days after the start of such event (unless OWNER's Consultant allows additional time for claimant to submit additional or more accurate data in support of such Claim, dispute, or other matter). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions. A Claim for an adjustment in Contract Time shall be prepared in accordance with the provisions. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to OWNER's Consultant and the claimant within 30 days after receipt of the claimant's last submittal (unless OWNER allows additional time).

B. OWNER'S Consultant's decision: OWNER'S Consultant will render a formal decision within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any. OWNER'S Consultant's written decision on such claim, dispute or other matter will be final and binding on the OWNER and CONTRACTOR unless:

1. An appeal from OWNER'S decision is taken within the time limits and in accordance with the dispute resolution procedures, a written notice of intent to appeal from OWNER'S written decision is delivered by OWNER or CONTRACTOR to the other and to OWNER'S Consultant within 30 days after the date of such decision, and a formal proceeding is instituted by the appealing party in a forum of competent jurisdiction within 60 days after the date of such decision or within 60 days after Substantial Completion, whichever is later (unless otherwise agreed in writing by OWNER and CONTRACTOR), to exercise such rights or remedies as the appealing party may have with respect to such Claim, dispute, or other matter in accordance with applicable Laws and Regulations.

C. If Owner's Consultant does not render a formal decision in writing within the time stated, a decision denying the Claim in its entirety shall be deemed to have been issued 31 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any.

D. No Claim for an adjustment in Contract Price or Contract Times (or Milestones) will be valid if not submitted.

11- COST OF THE WORK; CASH ALLOWANCES; UNIT PRICE WOR

11.1 Cost of the Work

A. Costs Included: The term Cost of the Work means the sum of all costs necessarily incurred and paid by CONTRACTOR in the proper performance of the

Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to CONTRACTOR will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by OWNER, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items, and shall not include any of the costs itemized.

1. Payroll costs for employees in the direct employ of CONTRACTOR in the performance of the Work under schedules of job classifications agreed upon by OWNER and CONTRACTOR. Such employees shall include without limitation superintendents, foremen, and other personnel employed full time at the Site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by OWNER.
2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to CONTRACTOR unless OWNER deposits funds with CONTRACTOR with which to make payments, in which case the cash discounts shall accrue to OWNER. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to OWNER, and CONTRACTOR shall make provisions so that they may be obtained.
3. Payments made by CONTRACTOR to Subcontractors for Work performed by Subcontractors. If required by OWNER, CONTRACTOR shall obtain competitive bids from subcontractors acceptable to OWNER and CONTRACTOR and shall deliver such bids to OWNER, who will then determine which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as CONTRACTOR's Cost of the Work and fee as provided.

B. Costs Excluded: The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of CONTRACTOR's officers, executives, principals (of partnerships and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by CONTRACTOR, whether at the Site or in CONTRACTOR's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications, all of which are to be considered administrative costs covered by the CONTRACTOR's fee.

2. Expenses of CONTRACTOR's principal and branch offices other than CONTRACTOR's office at the Site.
3. Any part of CONTRACTOR's capital expenses, including interest on CONTRACTOR's capital employed for the Work and charges against CONTRACTOR for delinquent payments.
4. Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly.

C. CONTRACTOR's Fee: When all the Work is performed on the basis of cost-plus, CONTRACTOR's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, CONTRACTOR's fee shall be determined.

D. Documentation: Whenever the Cost of the Work for any purpose is to be determined, CONTRACTOR will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to OWNER an itemized cost breakdown together with supporting data.

11.2 Cash Allowances

A. It is understood that CONTRACTOR has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums as may be acceptable to OWNER. CONTRACTOR agrees that:

1. the allowances include the cost to CONTRACTOR (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
2. CONTRACTOR's costs for unloading and handling on the Site, labor, installation costs, overhead, profit, and other expenses contemplated for the allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

B. Prior to final payment, an appropriate Change Order will be issued as recommended by OWNER to significantly deviate from the estimated quantity of such item indicated in the Agreement; and

1. there is no corresponding adjustment with respect any other item of Work; and

2. if CONTRACTOR believes that CONTRACTOR is entitled to an increase in Contract Price as a result of having incurred additional expense or OWNER believes that OWNER is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

11.3 Unit Price Work

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by CONTRACTOR will be made by CONTRACTOR.

B. Each unit price will be deemed to include an amount considered by CONTRACTOR to be adequate to cover CONTRACTOR's overhead and profit for each separately identified item.

12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES reflect actual amounts due CONTRACTOR on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

12.1 Change of Contract Price

A. The Contract Price may only be changed by a Change Order or by a Written Amendment. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the OWNER and the other party to the Contract in accordance with the provisions.

B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions); or
2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit; or
3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached, on the basis of the Cost of the Work (determined as provided) plus a CONTRACTOR's fee for overhead and profit (determined as provided).

12.2 Delays Beyond CONTRACTOR's Control

A. Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of CONTRACTOR, the Contract Times (or Milestones) will be extended in an amount

equal to the time lost due to such delay if a Claim is made. Delays beyond the control of CONTRACTOR shall include, but not be limited to, acts or neglect by OWNER, acts or neglect of utility owners or other contractors performing other work, fires, floods, epidemics, abnormal weather conditions, or acts of God.

12.3 Delays Within CONTRACTOR's Control

A. The Contract Times will not be extended due to delays within the control of CONTRACTOR. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of CONTRACTOR.

12.4 Delays Beyond OWNER's and CONTRACTOR's Control

A. Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of both OWNER and CONTRACTOR, an extension of the Contract Times (or Milestones) in an amount equal to the time lost due to such delay shall be CONTRACTOR's sole and exclusive remedy for such delay.

12.5 Delay Damages

A. In no event shall OWNER be liable to CONTRACTOR, any Subcontractor, any Supplier, or any other person or organization, or to any surety for or employee or agent of any of them, for damages arising out of or resulting from:

1. delays caused by or within the control of CONTRACTOR; or
2. delays beyond the control of both OWNER and CONTRACTOR including but not limited to fires, floods, epidemics, abnormal weather conditions, acts of God, or acts or neglect by utility owners or other contractors performing other work.

B. Nothing bars a change in Contract Price to compensate CONTRACTOR due to delay, interference, or disruption directly attributable to actions or inactions of OWNER or anyone for whom OWNER is responsible

13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.1 Notice of Defects

A. Prompt notice of all defective Work of which OWNER has actual knowledge will be given to CONTRACTOR. All defective Work may be rejected, corrected, or accepted as provided.

13.2 Access to Work

A. OWNER, OWNER's Consultants, or other representatives and personnel of OWNER, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspecting, and testing. CONTRACTOR shall provide them proper and safe conditions for such access and advise them of CONTRACTOR's Site safety procedures and programs so that they may comply therewith as applicable.

13.3 Tests and Inspections

A. CONTRACTOR shall give OWNER timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

B. OWNER shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

1. for inspections, tests, or approvals covered;
2. that costs incurred in connection with tests or inspections conducted shall be paid as provided; and
3. as otherwise specifically provided in the Contract Documents.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, CONTRACTOR shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish OWNER the required certificates of inspection or approval.

D. CONTRACTOR shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for OWNER's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to CONTRACTOR's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to OWNER.

E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by CONTRACTOR without written concurrence of OWNER, it must, if requested by OWNER, be uncovered for observation.

F. Uncovering Work shall be at CONTRACTOR's expense unless CONTRACTOR has given OWNER timely notice of CONTRACTOR's intention to cover the same and OWNER has not acted with reasonable promptness in response to such notice.

13.4 Uncovering Work

A. If any Work is covered contrary to the written request of OWNER, it must, if requested by OWNER, be uncovered for OWNER's observation and replaced at CONTRACTOR's expense.

B. If OWNER considers it necessary or advisable that covered Work be observed by OWNER or inspected or tested by others, CONTRACTOR, at OWNER's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as OWNER may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment. If it is found that such Work is defective, CONTRACTOR shall pay all Claims, costs,

losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and OWNER shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, OWNER may make a Claim. If, however, such Work is not found to be defective, CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Times (or Milestones), or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, CONTRACTOR may make a Claim.

13.5 OWNER May Stop the Work

A. If the Work is defective, or CONTRACTOR fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, OWNER may order CONTRACTOR to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of OWNER to stop the Work shall not give rise to any duty on the part of OWNER to exercise this right for the benefit of CONTRACTOR, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.6 Correction or Removal of Defective Work

A. CONTRACTOR shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by OWNER, remove it from the Project and replace it with Work that is not defective. CONTRACTOR shall pay all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

13.7 Correction Period

A. If within one year after the date of Substantial Completion or such longer period of time as may be prescribed by Laws or Regulations or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for CONTRACTOR's use by OWNER or permitted by Laws and Regulations is found to be defective, CONTRACTOR shall promptly, without cost to OWNER and in accordance with OWNER's written instructions: (i) repair such defective land or areas, or (ii) correct such defective Work or, if the defective Work has been rejected by OWNER, remove it from the Project and replace it with Work that is not defective, and (iii) satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom. If CONTRACTOR does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, OWNER may have the defective Work corrected or repaired or may have

the rejected Work removed and replaced, and all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by CONTRACTOR.

B. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications or by Written Amendment.

C. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

D. CONTRACTOR's obligations are in addition to any other obligation or warranty. The provisions shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitation or repose.

13.8 Acceptance of Defective Work

A. If, instead of requiring correction or removal and replacement of defective Work, OWNER prefers to accept it, OWNER may do so. CONTRACTOR shall pay all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to OWNER's evaluation of and determination to accept such defective Work (such costs to be approved by OWNER as to reasonableness) and the diminished value of the Work to the extent not otherwise paid by CONTRACTOR pursuant to this sentence. If any such acceptance occurs prior to OWNER's approval of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and OWNER shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, OWNER may make a Claim. If the acceptance occurs after such recommendation, an appropriate amount will be paid by CONTRACTOR to OWNER.

13.9 OWNER May Correct Defective Work

A. If CONTRACTOR fails within a reasonable time after written notice from OWNER to correct defective Work or to remove and replace rejected Work as required by OWNER, or if CONTRACTOR fails to perform the Work in accordance with the Contract Documents, or if CONTRACTOR fails to comply with any other provision of the Contract Documents, OWNER may, after seven days written notice to CONTRACTOR, correct and remedy any such deficiency.

B. In exercising the rights and remedies under this paragraph, OWNER shall proceed expeditiously. In connection with such corrective and remedial action, OWNER may exclude CONTRACTOR from all or part of the Site, take possession of all or part of the Work and suspend CONTRACTOR's services related thereto,

take possession of CONTRACTOR's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which OWNER has paid CONTRACTOR but which are stored elsewhere. CONTRACTOR shall allow OWNER, OWNER's representatives, agents and employees, OWNER's other contractors, and OWNER's Consultants access to the Site to enable OWNER to exercise the rights and remedies under this paragraph.

C. All Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by OWNER in exercising the rights and remedies will be charged against CONTRACTOR, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and OWNER shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, OWNER may make a Claim. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of CONTRACTOR's defective Work.

D. CONTRACTOR shall not be allowed an extension of the Contract Times (or Milestones) because of any delay in the performance of the Work attributable to the exercise by OWNER of OWNER's rights and remedies.

14 - PAYMENTS TO CONTRACTOR AND COMPLETION

14.1 Schedule of Values

A. The schedule of values established as provided will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to OWNER. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.2 Progress Payments

A. Applications for Payments

1. At least seven (7) days before the date established for each progress payment (but not more often than once a month), CONTRACTOR shall submit to OWNER for review an Application for Payment filled out and signed by CONTRACTOR covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that OWNER has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect OWNER's interest therein, all of which must be satisfactory to OWNER.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of CONTRACTOR stating that all previous progress

payments received on account of the Work have been applied on account to discharge CONTRACTOR's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. Review of Applications

1. OWNER will, within five (5) days after receipt of each Application for Payment, either indicate in writing an approval of payment or return the Application to CONTRACTOR indicating in writing OWNER's reasons for refusing to recommend payment. In the latter case, CONTRACTOR may make the necessary corrections and resubmit the Application.

2. OWNER's approval of any payment requested in an Application for Payment will be based on OWNER's observations on the Site of the executed Work and on OWNER's review of the Application for Payment and the accompanying data and schedules, that to the best of OWNER's knowledge, information and belief:

a. the Work has progressed to the point indicated;

b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work, and to any other qualifications stated in the recommendation); and

c. the conditions precedent to CONTRACTOR's being entitled to such payment appear to have been fulfilled in so far as it is OWNER's responsibility to observe the Work.

3. By recommending any such payment OWNER will not thereby be deemed to have represented that: (i) inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to OWNER in the Contract Documents; or (ii) that there may not be other matters or issues between the parties that might entitle CONTRACTOR to be paid additionally by OWNER or entitle OWNER to withhold payment to CONTRACTOR.

4. Neither OWNER's review of CONTRACTOR's Work for the purposes of approving payments nor OWNER's approval of any payment, including final payment, will impose responsibility on OWNER to supervise, direct, or control the Work or for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for CONTRACTOR's failure to comply with Laws and Regulations applicable to CONTRACTOR's performance of the Work. Additionally, said review or recommendation will not impose responsibility on OWNER to make any examination to ascertain how or for what purposes CONTRACTOR has used the moneys paid on account of the Contract Price, or to determine that title to

any of the Work, materials, or equipment has passed to OWNER free and clear of any Liens.

5. OWNER may refuse to recommend the whole or any part of any payment if, in OWNER's opinion, it would be incorrect to make the representations. OWNER may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in OWNER's opinion to protect OWNER from loss because:

- a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;
- b. the Contract Price has been reduced by Written Amendment or Change Orders;
- c. OWNER has been required to correct defective Work or complete Work; or
- d. OWNER has actual knowledge of the occurrence of any of the events enumerated.

C. Payment Becomes Due

1. Within thirty days (30) after presentation of the Application for Payment to OWNER with OWNER's approval, the amount recommended will (subject to the provisions) become due, and when due will be paid by OWNER to CONTRACTOR.

D. Reduction in Payment

1. OWNER may refuse to make payment of the full amount because:

- a. claims have been made against OWNER on account of CONTRACTOR's performance or furnishing of the Work;
- b. Liens have been filed in connection with the Work, except where CONTRACTOR has delivered a specific Bond satisfactory to OWNER to secure the satisfaction and discharge of such Liens;
- c. there are other items entitling OWNER to a set-off against the amount recommended; or
- d. OWNER has actual knowledge of the occurrence of any of the events enumerated.

2. If OWNER refuses to make payment of the full amount, OWNER must give CONTRACTOR immediate written notice stating the reasons for such action and promptly pay CONTRACTOR any amount remaining after deduction of the amount so withheld. OWNER shall promptly pay CONTRACTOR the amount so withheld, or any adjustment thereto agreed to by OWNER and

CONTRACTOR, when CONTRACTOR corrects to OWNER's satisfaction the reasons for such action.

3. If it is subsequently determined that OWNER's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due.

14.3 CONTRACTOR's Warranty of Title

A. CONTRACTOR warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to OWNER no later than the time of payment free and clear of all Liens.

14.4 Substantial Completion

A. When CONTRACTOR considers the entire Work ready for its intended use CONTRACTOR shall notify OWNER in writing that the entire Work is substantially complete (except for items specifically listed by CONTRACTOR as incomplete) and request that OWNER issue a certificate of Substantial Completion. Promptly thereafter, OWNER and CONTRACTOR shall make an inspection of the Work to determine the status of completion. If OWNER does not consider the Work substantially complete, OWNER will notify CONTRACTOR in writing giving the reasons therefor. If OWNER considers the Work substantially complete, OWNER will prepare a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. If OWNER concludes that the Work is not substantially complete, OWNER will notify CONTRACTOR in writing, stating the reasons therefore. At the time of delivery of the tentative certificate of Substantial Completion OWNER will deliver to CONTRACTOR a written recommendation as to division of responsibilities pending final payment between OWNER and CONTRACTOR with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless OWNER and CONTRACTOR agree otherwise in writing, aforesaid recommendation will be binding on OWNER and CONTRACTOR until final payment.

B. OWNER shall have the right to exclude CONTRACTOR from the Site after the date of Substantial Completion, but OWNER shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.

14.5 Partial Utilization

A. Use by OWNER at OWNER's option of any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which OWNER and CONTRACTOR agree constitutes a separately functioning and usable part of the Work that can be used by OWNER for its intended purpose without significant interference with CONTRACTOR's performance of the remainder of the Work, may be accomplished prior to Substantial Completion of all the Work subject to the following conditions.

1. OWNER at any time may request CONTRACTOR in writing to permit OWNER to use any such part of the Work which OWNER believes to be ready for its intended use and substantially complete. If CONTRACTOR agrees that such part of the Work is substantially complete, CONTRACTOR will certify to OWNER that such part of the Work is substantially complete and request

OWNER to issue a certificate of Substantial Completion for that part of the Work. CONTRACTOR at any time may notify OWNER in writing that CONTRACTOR considers any such part of the Work ready for its intended use and substantially complete and request OWNER to issue a certificate of Substantial Completion for that part of the Work. Within a reasonable time after either such request, OWNER and CONTRACTOR shall make an inspection of that part of the Work to determine its status of completion. If OWNER does not consider that part of the Work to be substantially complete, OWNER will notify CONTRACTOR in writing giving the reasons therefor. If OWNER considers that part of the Work to be substantially complete, the provisions will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

2. No occupancy or separate operation of part of the Work may occur prior to compliance with the requirements regarding property insurance.

14.6 Final Inspection

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

14.7 Final Payment

A. Application for Payment

1. After CONTRACTOR has, in the opinion of OWNER, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, Bonds, certificates or other evidence of insurance certificates of inspection, marked-up record documents, and other documents, CONTRACTOR may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (except as previously delivered) by: (i) all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required; (ii) consent of the surety, if any, to final payment; and (iii) complete and legally effective releases or waivers (satisfactory to OWNER) of all Lien rights arising out of or Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified and as approved by OWNER, CONTRACTOR may furnish receipts or releases in full and an affidavit of CONTRACTOR that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which OWNER or OWNER's property might in any way be responsible have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, CONTRACTOR may

furnish a Bond or other collateral satisfactory to OWNER to indemnify OWNER against any Lien.

B. Review of Application and Acceptance

1. If, on the basis of OWNER's observation of the Work during construction and final inspection, and OWNER's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, OWNER is satisfied that the Work has been completed and CONTRACTOR's other obligations under the Contract Documents have been fulfilled, OWNER will, within ten days after receipt of the final Application for Payment, process payment. At the same time OWNER will also give written notice to CONTRACTOR that the Work is acceptable subject to the provisions. Otherwise, OWNER will return the Application for Payment to CONTRACTOR, indicating in writing the reasons for refusing to recommend final payment, in which case CONTRACTOR shall make the necessary corrections and resubmit the Application for Payment.

C. Payment Becomes Due

1. Thirty (30) days after the presentation to OWNER of the approved Application for Payment and accompanying documentation, the final payment amount will become due and, when due, will be paid by OWNER to CONTRACTOR.

14.8 Final Completion Delayed

A. If, through no fault of CONTRACTOR, final completion of the Work is significantly delayed, and if OWNER so confirms, OWNER shall, upon receipt of CONTRACTOR's final Application for Payment, and without terminating the Agreement, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by OWNER for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if Bonds have been furnished as required, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by CONTRACTOR to OWNER with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

15 - SUSPENSION OF WORK AND TERMINATION

15.1 OWNER May Suspend Work

A. At any time and without cause, OWNER may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to CONTRACTOR which will fix the date on which Work will be resumed. CONTRACTOR shall resume the Work on the date so fixed. CONTRACTOR shall be allowed an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if CONTRACTOR makes a Claim.

15.2 OWNER May Terminate for Cause

A. The occurrence of any one or more of the following events will justify termination for cause:

1. CONTRACTOR's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the progress schedule established as adjusted from time to time;
2. CONTRACTOR's disregard of Laws or Regulations of any public body having jurisdiction;
3. CONTRACTOR's disregard of the authority of OWNER; or
4. CONTRACTOR's violation in any substantial way of any provisions of the Contract Documents.

B. If one or more of the events identified occur, OWNER may, after giving CONTRACTOR (and the surety, if any) seven days written notice, terminate the services of CONTRACTOR, exclude CONTRACTOR from the Site, and take possession of the Work and of all CONTRACTOR's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by CONTRACTOR (without liability to CONTRACTOR for trespass or conversion), incorporate in the Work all materials and equipment stored at the Site or for which OWNER has paid CONTRACTOR but which are stored elsewhere, and finish the Work as OWNER may deem expedient. In such case, CONTRACTOR shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by OWNER arising out of or relating to completing the Work, such excess will be paid to CONTRACTOR. If such claims, costs, losses, and damages exceed such unpaid balance, CONTRACTOR shall pay the difference to OWNER. Such claims, costs, losses, and damages incurred by OWNER will be reviewed as to their reasonableness and, when so approved, incorporated in a Change Order. When exercising any rights or remedies under this paragraph OWNER shall not be required to obtain the lowest price for the Work performed.

C. Where CONTRACTOR's services have been so terminated by OWNER, the termination will not affect any rights or remedies of OWNER against CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of moneys due CONTRACTOR by OWNER will not release CONTRACTOR from liability.

15.3 OWNER May Terminate For Convenience

A. Upon seven days written notice to CONTRACTOR, OWNER may, without cause and without prejudice to any other right or remedy of OWNER, elect to terminate the Contract. In such case, CONTRACTOR shall be paid (without duplication of any items):

1. for completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
2. for expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;
3. for all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and
4. for reasonable expenses directly attributable to termination.

B. CONTRACTOR shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.4 CONTRACTOR May Stop Work or Terminate

A. If, through no act or fault of CONTRACTOR, the Work is suspended for more than 90 consecutive days by OWNER or under an order of court or other public authority, or OWNER fails to act on any Application for Payment within 30 days after it is submitted, or OWNER fails for 30 days to pay CONTRACTOR any sum finally determined to be due, then CONTRACTOR may, upon seven days written notice to OWNER, and provided OWNER does not remedy such suspension or failure within that time, terminate the Contract and recover from OWNER payment on the same terms as provided. In lieu of terminating the Contract and without prejudice to any other right or remedy, if OWNER has failed to act on an Application for Payment within 30 days after it is submitted, or OWNER has failed for 30 days to pay CONTRACTOR any sum finally determined to be due, CONTRACTOR may, seven days after written notice to OWNER, stop the Work until payment is made of all such amounts due CONTRACTOR, including interest thereon. The provisions are not intended to preclude CONTRACTOR from making a Claim for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to CONTRACTOR's stopping the Work as permitted by this paragraph.

16 - DISPUTE RESOLUTION

16.1 Methods and Procedures

A. Dispute resolution methods and procedures, if any, shall be as set forth in the Supplementary Conditions. If no method and procedure has been set forth, and subject to the provisions, OWNER and CONTRACTOR may exercise such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any dispute.

17 - MISCELLANEOUS

17.1 Giving Notice

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.2 Computation of Times

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

17.3 Cumulative Remedies

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

17.4 Survival of Obligations

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

17.5 Controlling Law

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

B. For costs incurred, the CONTRACTOR's fee shall be five percent;

C. Where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor and that any higher tier Subcontractor and CONTRACTOR will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;

D. No fee shall be payable on the basis of costs itemized;

E. The amount of credit to be allowed by CONTRACTOR to OWNER for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in CONTRACTOR's fee by an amount equal to five percent of such net decrease; and

F. When both additions and credits are involved in any one change, the adjustment in CONTRACTOR's fee shall be computed on the basis of the net change.

SECTION 6 SUPPLEMENTARY CONDITIONS

1 - DEFINITIONS & TERMINOLOGY

1.1 Defined terms

A. Whenever used in the Contract Documents and printed with initial or all capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof.

1. OWNER's Representative – The OWNER's Representative shall be the OWNER as described in the General Conditions.

B. The CONTRACTOR shall be responsible for the notifying all property owners within and adjacent to the project twenty-four (24) hours prior to commencing construction operations. Said notice shall be in writing and in a form acceptable to the OWNER.

C. Prior to the start of the project, the CONTRACTOR shall identify to the OWNER, any tree limbs which overly and interfere with the work. Said limbs to be removed by the OWNER.

2 – AVAILABILITY OF LANDS

A. The CONTRACTOR shall not, except after written consent from proper parties, enter or occupy with men, tools, materials or equipment, any privately-owned land except on easements provided herein.

3 – SUBSURFACE AND PHYSICAL CONDITIONS

A. In the preparation of Drawings and Specifications, OWNER relied upon the following report of explorations and tests of the subsurface conditions at the site:
None

B. The asphalt pavement, curbs and existing sidewalks in the work area are considered to be in good to excellent condition prior to the start of the project.

C. Any scars, nicks, gasoline, oil, etc., or other defacement or damage to the existing streets, curbs, or sidewalks will be the responsibility of the CONTRACTOR to repair.

D. Before beginning the job, the CONTRACTOR may point out and note to the inspector any specific areas that are already damaged. Thereafter, the CONTRACTOR will not be held responsible for repairs to these areas.

4 – CERTIFICATES OF INSURANCE

4.1 The following types of insurance shall be furnished for the duration of the project and Certificates of Insurance extending the provisions listed below shall be furnished to OWNER prior to or at the time the contract is executed by CONTRACTOR and before a Notice to Proceed is issued:

A. Worker's Compensation

1. Definitions:

a. Certificate of coverage ("certificate") - A copy of a certificate of insurance, a certificate of authority to self-insure issued by the commission, or a coverage agreement (TWCC-81, TWCC-82, TWCC-83, or TWCC-84), showing statutory workers' compensation insurance coverage for the person's or entity's employees providing services on a project, for the duration of the project.

b. Duration of the project - includes the time from the beginning of the work on the project until the contractor's/person's work on the project has been completed and accepted by the governmental entity.

c. Person's providing services on the project ("subcontractor") - includes all persons or entities performing all or part of the services the contractor has undertaken to perform on the project, regardless of whether that person contracted directly with the contractor and regardless of whether that person has employees. This includes, without limitation, independent contractors, subcontractors, leasing companies, motor carriers, owner-operators, employees of any such entity, or employees of any entity which furnishes persons to provide services on the project. "Services" include, without limitation, providing, hauling, or delivering equipment or materials, or providing labor, transportation, or other service related to a project. "Services" does not include activities unrelated to the project, such as food/beverage vendors, office supply deliveries, and delivery of portable toilets.

2. The contractor shall provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011 (44) for all employees of the contractor providing services on the project, for the duration of the project.

3. The contractor must provide a certificate of coverage to the governmental entity prior to being awarded the contract.

4. If the coverage period shown on the contractor's current certificate of coverage ends during the duration of the project, the contractor must, prior to the end of the coverage period, file a new certificate of coverage with the governmental entity showing that coverage has been extended.

5. The contractor shall obtain from each person providing services on a project, and provide to the governmental entity:

a. a certificate of coverage, prior to that person beginning work on the project, so the governmental entity will have on file certificates of coverage for all persons providing services on the project; and

b. no later than seven days after receipt by the contractor, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project.

6. The contractor shall retain all required certificates of coverage for the duration of the project and for one year thereafter.
7. The contractor shall notify the governmental entity in writing by certified mail or personal delivery, within 10 days after the contractor knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project.
8. The contractor shall post on each project site a notice, in the text, form and manner prescribed by the Texas Workers' Compensation Commission, informing all persons providing services on the project that they are required to be covered, and stating how a person may verify coverage and report lack of coverage.
9. The contractor shall contractually require each person with whom it contracts to provide services on a project, to:
 - a. provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011 (44) for all of its employees providing services on the project, for the duration of the project;
 - b. provide to the contractor, prior to that person beginning work on the project, a certificate of coverage showing that coverage is being provided services on the project for the duration of the project;
 - c. provide the contractor, prior to the end of the coverage period, a new certificate of coverage showing extension of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project;
 - d. obtain from each other person with whom it contracts, and provide to the contractor:
 - i. certificate of coverage, prior to the other person beginning work on the project; and
 - ii. a new certificate of coverage showing extension of coverage, prior to the end of the coverage period, if the coverage period shown on the current coverage ends during the duration of the project;
 - e. retain all required certificates of coverage on file for the duration of the project and for one year thereafter;
 - f. notify the governmental entity in writing by certified mail or personal delivery, within 10 days after the person knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project; and
 - g. contractually require each person with whom it contracts, to perform as required, with the certificates of coverage to be provided to the person for whom they are providing services.

10. By signing this contract or providing or causing to be provided a certificate of coverage, the contractor is representing to the governmental entity that all employees of the contractor who will provide services on the project will be covered by workers' compensation coverage for the duration of the project, that the coverage will be based on proper reporting or classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or, in the case of a self-insured, with the commission's Division of Self-Insurance Regulation. Providing false or misleading information may subject the contractor to administrative penalties, criminal penalties, civil penalties, or civil actions.

11. The contractor's failure to comply with any of these provisions is a breach of contract by the contractor which entitles the governmental entity to declare the contract void if the contractor does not remedy the breach within ten days after receipt of the notice of breach from the governmental entity.

B. Automobile Liability Insurance with limits of:

1. Bodily Injury \$1,000,000 per person \$3,000,000 per accident

2. Property Damage \$300,000 per accident

3. The Insurance company must have as a minimum a current A.M. Best rating of A.

4. General Requirements for Insurance Coverage:

a. The Certificate of Insurance furnished by the Contractor shall show by specific reference that each of the foregoing items have been provided for;

b. Certificates of Insurance required for each copy of the agreement which specifically set forth evidence of all required coverage will be filed with the City prior to the City's execution of the contract. Worker's Compensation Insurance coverage must be provided to the City prior to the City's award of the contract.

c. The Certificates of Insurance furnished by the contractor as evidence of the Insurance maintained by the contractor will include a clause obligating the Insurer to give the City of Leon Valley thirty (30) days prior written notice of cancellation or any material change in the insurance coverage.

d. Waiver of Subrogation: The City of Leon Valley and the Contractor waive all rights and the rights of their respective insurance companies against each other for damages caused by fire or other perils to the extent such damages are covered by property insurance purchased by either party.

C. Comprehensive General Liability endorsed to include blanket contractual coverage:

1. Bodily Injury - \$ 2,000,000 each occurrence with a deductible of not more than \$ 2,500.

2. Property Damage Liability - \$250,000 each occurrence; \$250,000 aggregate.

3. This insurance shall:

a. Include completed operation coverage which is to be kept in force by the Contractor for a period of not less than one year after the completion of the work provided for or performed under these specifications;

b. Not be subject to any of the special property damage liability exclusions commonly referred to as the XCU exclusions pertaining to blasting or explosion, collapse, or structural damage and underground property;

c. Not be subject to any exclusion of property used by the insured or property in the case, custody or control of the insured or property as to which the insured for any purpose is exercising physical control;

d. The OWNER shall be named as an additional insured for the insurance coverage. In naming the OWNER as an additional insured on our comprehensive General Liability Insurance, the following words apply:

"Contractor shall defend, indemnify and hold harmless the City of Leon Valley from and against any liability, loss, cost and expense ("Liability") claimed by a third party (including reasonable attorney's fees and cost of defense) resulting from Contractor's performance of the Work to the extent that such Liability:

1) is attributable to bodily injury, sickness, disease or death, or to the injury to or destruction of tangible personal property; and,

2) is caused or contributed to by any neglect or fault of Contractor, its subcontractors, or their respective employees.

e. The Insurance company must have as a minimum a current A.M. Best rating of A.

f. Manufacturer's and Contractors' Liability insurance is not an acceptable substitute for Commercial Liability insurance.

D. When explosives are used, Comprehensive General Liability on an occurrence basis endorsed to include blanket contractual coverage:

a. Bodily Injury - \$ 2,000,000 each accident

b. Property Damage Liability - \$ 300,000 each accident; \$ 3,000,000 aggregate.

E. The OWNER shall be listed as the Certificate Holder, and the OWNER shall be named as Additional Insured in all coverage described in the above paragraphs except Worker's compensation.

F. Insurance and additional Insured requirements shall apply to and be enforced equally upon authorized subcontractors as well as the CONTRACTOR.

F. In the submission of the Certificate of Insurance, the insurance company in every case must agree to provide notice of cancellation of any insurance to the OWNER ten (10) days prior to such cancellation of policies covered by certificates.

5 – STREET AND DRIVEWAY CLOSING

5.1 After the CONTRACTOR has given the property owners not less than 24 nor more than 72 hours advance notice, he may close ½ of the driveway necessary for the day's operations. The CONTRACTOR will advise the Fire Marshall (684-3219) in advance of each closing. Suitable detour routes must be in place. At the end of each day, the closed driveway areas shall be reopened. All driveways must be accessible during the course of the work except for minimum periods and only after the CONTRACTOR has given property owners 24 hours' notice. CONTRACTOR shall not start work that would keep driveways blocked during the weekends. In the event of inclement weather, the CONTRACTOR must maintain possible access to the owners.

5.2 Barricades and Flagmen

A. The CONTRACTOR is to provide himself with necessary temporary barricades and traffic cones sufficient to alert the traffic in advance. Where lanes of traffic are to be closed, suitable barricades, warning signs and markers are to be provided by the CONTRACTOR.

1. Barricades and traffic control devices shall follow the Texas Uniform Municipal Control Devices standards to the satisfaction of the OWNER.

2. The OWNER has the right to prevent work from starting until suitable traffic control devices are provided, in the opinion of the OWNER.

3. The OWNER may direct the CONTRACTOR to provide additional traffic control devices and/or flagmen as they deem necessary to protect the public. All barricades will have one flashing light at night. All costs for traffic management and barricades will be included in the cost of the work.

6 – HAZARD COMMUNICATIONS PROGRAM

A. In compliance with Article 5182b, Texas Revised Civil Statutes, all employees are required to train and educate employees on the safe use and handling of hazardous materials that employees may be exposed to in the work place. The OWNER's Fire Chief is designated as the OWNER's HazComm Officer. Subcontractors of the CONTRACTOR are also required to comply with the requirements of the act

1. CONTRACTORS are entitled to a copy of the OWNER's workplace chemical list to which the CONTRACTOR, its employees and agents may be exposed to in the workplace.
2. CONTRACTORS are also entitled to a copy of the MSDS sheets for any hazardous chemicals which the OWNER may have in the work
3. place. CONTRACTORS have the obligation to inform their employees and agents of all these requirements. Prior to the commencement of any work, the CONTRACTOR shall furnish the OWNER's HazComm Officer with the MSDS sheets for any hazardous chemicals brought into the OWNER's work-site that OWNER's employees will have exposure to. The CONTRACTOR shall sign the Attachment, (hazard Communications Contractor Acknowledgment) certifying receipt of this information.

7 – WATER FOR CONSTRUCTION

- A. All water required by the CONTRACTOR for his operations will be furnished without charge by OWNER at a point designated by the OWNER. The CONTRACTOR shall make all necessary connections, including valves and shall transport all water at his expense. If needed, the CONTRACTOR will be required to pay a deposit for a fire hydrant meter, which deposit will be returned when the fire hydrant meter is returned in good condition.
- B. All water furnished by the City shall be subject to the regulations of the City regarding prevention of waste and water conservation.

8 - POWER FOR CONSTRUCTION

- A. The CONTRACTOR shall make his own arrangements for electric service and shall purchase all power required for his operation.

9 - SANITARY PROVISIONS

- A. The CONTRACTOR shall establish and enforce among his employee such regulations in regard to cleanliness and disposal of garbage and waste as shall tend to prevent the inception and spread of infectious or contagious diseases and to prevent effectively the creation of a nuisance about the work on any property either public or private; and such regulations as are required by the OWNER shall be put into immediate force and effect by the CONTRACTOR. The necessary sanitary conveniences for the use of laborers on the work, properly secluded from public observation, shall be constructed and maintained by the CONTRACTOR in such a manner and at such points as shall be approved by the OWNER; and their use shall be strictly enforced by the CONTRACTOR. All sanitary laws and regulations of the State of Texas and the OWNER's jurisdiction shall be strictly complied with.

SECTION 7 WAGES AND COMPENSATION

1 - GENERAL STATEMENT

This is a 100% locally funded and competitively bid Public Works Contract and Article 5159a, Revised Civil Statutes of Texas, as amended, requires that not less than the general prevailing wage rates (minimum hourly base pay and minimum hourly fringe benefits contribution) for work of similar character be paid to CONTRACTOR and subcontractor employees. These local prevailing and adopted wage rates are derived from the most current applicable federal prevailing wage rates as published by the United States Department of Labor, Dallas, Texas pursuant to the original intent and authority of the City of Leon Valley Ordinance passed by the City Council of the City of Leon Valley. Copies of both the current Ordinance and the wage rates, and are included instruments of this Contract and full compliance with same shall be required.

Any deviation from Wage and Labor Standard Provisions compliance may be cause for City's withholding either interim or final payment to the CONTRACTOR until such deviations are properly corrected.

2 - WAGE & HOUR OFFICE, PUBLIC WORKS, RESPONSIBILITIES

A. The City of Leon Valley's Project Manager is primarily responsible for all Wage and Labor Standard Provisions investigation and enforcement and will monitor CONTRACTOR/subcontractors practices to assure the City Manager that:

1. Appropriate weekly compliance statements and payroll records are submitted to the City by the CONTRACTOR/subcontractors and that such are reviewed for compliance with Wage and Labor Standard Provisions.
2. Apprentices/trainees working on the project are properly identified by CONTRACTOR/subcontractor on payroll records and documented as being included in programs currently sanctioned by appropriate federal or state regulatory agencies.
3. Applicable Wage Determination Decisions, including any applicable modifications and related statements are posted at the work-site by the CONTRACTOR and that proper job classifications and commensurate minimum hourly base and fringe wage rates are paid.
4. Employees are periodically interviewed (at random) on each project as required.
5. That no person employed by CONTRACTOR or subcontractor is induced against his will, by any means, to give up any part of the compensation to which he is otherwise entitled.
6. That any and all periodic administrative directives to the Project Manager from the City Manager are being implemented.

3 - CLAIMS & DISPUTES PERTAINING TO WAGE RATES

Claims and disputes not promptly and routinely settled by the CONTRACTOR and/or subcontractor and employees pertaining to wage rates, or to job classifications of labor employed upon the work covered by the Contract, shall be reported by the employee in writing, within 60 calendar days of employee's receipt of any allegedly incorrect classification, wage or benefit report, to the Public Works Department, City of Leon Valley, for further investigation. Claims and disputes not reported by the employee to the Project Manager in writing within sixty (60) calendar day period shall be deemed waived by the employee for the purposes of the City administering and enforcing the City's Contract rights against the CONTRACTOR on behalf of the employee. Waivers by the employee of this City intervention shall not constitute waivers by the City or employee to independently pursue contractual rights it has against the CONTRACTOR/subcontractor for breach of Contract and other sanctions available to enforce the Wage and Labor Standard Provisions.

4 - BREACH OF WAGE & LABOR STANDARDS PROVISIONS

The City of Leon Valley reserves the right to terminate this Contract for cause if the CONTRACTOR/subcontractors shall knowingly and continuously breach, without timely restitution or cure, any of these governing Wage and Labor Standard Provisions. A knowing and un-remedied proven violation of these Wage and Labor Standard Provisions may also be grounds for debarment of the CONTRACTOR/subcontractor from future City of Leon Valley contracts for lack of responsibility, as determined by the City of Leon Valley. Recurrent violations, whether remedied or not, will be considered by the City Manager when assessing the responsibility history of potential CONTRACTOR/subcontractor prior to a competitive award of future Public Work projects. The general remedies are not exhaustive and not cumulative, for the City reserves legal and contractual rights to others specific remedies outlined herein below and in other parts of this Contract and as are allowed by applicable City of Leon Valley Ordinances, State and Federal statutes.

5 - EMPLOYMENT OF LABORERS/MECHANICS NOT LISTED IN WAGE DETERMINATION DECISION

In the event that a Contractor/subcontractor discovers that construction of a particular work element requires a certain employee classification and skill that is not listed in the wage determination decision contained in the original Contract Documents, Contractor/subcontractors will make prompt inquiry (before bidding, if possible) to the Wage and Hour Monitor identifying that class of laborers/mechanics not listed in the wage determination decision who are intended to be employed, or who are being employed, under the contract Using his best judgment and information resources available to him at the time, and any similar prior decisions, the City Manager, City of Leon Valley, shall classify said laborers/mechanics by issuing a special local wage determination decision to the Contractor or subcontractor, which shall be enforced by the Wage and Hour Monitor.

6 - OVERTIME COMPENSATION ON NON-FEDERALLY FUNDED PROJECTS

No CONTRACTOR/subcontractor contracting for any part of the non-federally funded Contract Work (except for work site related security guard services), which may require or involve the employment of laborers/mechanics, shall require or permit any laborer/mechanic in any seven (7) calendar day work period in which he/she is employed

on such work, to work in excess of 40 hours in such work period, unless said laborer/mechanic receives compensation at a rate not less than one and one-half times the basic hourly rate of pay for all hours worked in excess of 40 hours in a seven (7) calendar day work period. Any applicable fringe benefits must be paid for straight time and overtime; however, fringe benefits are not included when computing the overtime rate.

7 - PAYMENT OF CASH EQUIVALENT FRINGE BENEFITS

A. All laborers/mechanics employed to construct the work governed by this Contract shall be paid not less than weekly the full amount of wages due (minimum hourly base pay and any applicable minimum hourly fringe benefit contribution for all hours worked, including overtime) for the immediately preceding pay period, computed at wage and fringe rates not less than those contained in the wage determination decision included in this Contract. Only payroll deductions as are mandated by state or federal law and those legal deductions previously approved in writing by the employee, or as are otherwise permitted by state or federal law, may be withheld by the CONTRACTOR/subcontractor.

B. Should the CONTRACTOR/subcontractor subscribe to fringe benefit programs for employees, such programs shall be fully approved by the City in adopting a previous United States Department of Labor decision on such fringe benefit programs or by applying DOL criteria, in rendering a local decision on the adequacy of the fringe benefit programs. The approved programs shall be in place at the time of City Contract execution and provisions thereof disclosed to the Wage and Hour Monitor, City of Leon Valley, for legal review prior to project commencement.

C. Regular CONTRACTOR/subcontractor contributions made to, or costs incurred for, approved fringe benefit plans, funds or other benefit programs that cover periods of time greater than the one week payroll period (e.g., monthly or quarterly, etc.) Shall be prorated by the CONTRACTOR/subcontractor on weekly payroll records to reflect the equivalent value of the hourly and weekly

C. The CONTRACTOR/subcontractor is allowed to pay a minimum hourly cash equivalent of any applicable minimum hourly fringe benefits listed in the wage determination decision, in lieu of the contribution of benefits to a permissible fringe benefit plan, for all hours worked, including overtime. An employee is not allowed to receive less than the minimum hourly basic rate of pay specified in the wage determination decision.

8 - WORK CONDUCTED ON HOLIDAYS – NON-FEDERALLY FUNDED PROJECTS

If a laborer/mechanic is employed in the normal course and scope of his or her work on the job site on New Year's Day, Martin Luther King Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, or Christmas Day, or the calendar days observed as such in any given year, work shall be paid for at a no less than one and one half times the regular minimum hourly base pay regardless of the total number of hours the laborer/mechanic has accumulated during the pay period.

9 - UNDERPAYMENT OF WAGES OR SALARIES

A. When a "full investigation" (as called for in and as construed under Article 5159a, Section 2, and as further generally described in an administrative directive

to the City's Project Manager from the City Manager entitled "Conducting Wage and Labor Standards Investigations on 100% Locally-funded City Construction Project", as may be amended) evidences' underpayment of wages by CONTRACTOR or subcontractor to laborers/mechanics employed upon the work covered by the Contract, the City of Leon Valley, in addition to such other rights as may be afforded it under State and/or Federal law and/or this Contract, shall withhold from the CONTRACTOR, out of any payments (interim progress and/or final) due the CONTRACTOR, so much thereof as the City of Leon Valley may consider necessary to secure ultimate payment by the appropriate party to such laborers/mechanics, of full wages required by the Contract, plus a possible penalty (See B. below). The amount so withheld, excluding any possible penalty to be retained by the City, may be disbursed at an appropriate time after "full investigation" by the City of Leon Valley, for and on behalf of the CONTRACTOR/subcontractor (as may be appropriate), to the respective laborers/mechanics to whom the same is due, or on their behalf to fringe benefit plans, funds, or programs for any type of minimum fringe benefits prescribed in the applicable wage determination decision.

B. Article 5159a, Revised Civil Statutes of Texas, as amended, states that CONTRACTOR shall forfeit as a penalty to the City of Leon Valley the sum of sixty dollars (\$60.00) for each calendar day, or portion thereof, for each laborer, workman, or mechanic, who is paid less than the said stipulated rate for any work done under this Contract whether by the CONTRACTOR himself, or by any subcontractor working under him. Pursuant to and supplemental of this statutory authority, the City of Leon Valley and the CONTRACTOR/subcontractor contractually acknowledges and agrees that said sixty dollars (\$60.00) a statutory penalty shall be construed by and between the City of Leon Valley and the CONTRACTOR/subcontractor as liquidated damages, and not as a penalty, and will apply to any violations herein, resulting from CONTRACTOR/subcontractor underpayment violations.

D. If unpaid or underpaid workers cannot be located by the CONTRACTOR or the City after diligent efforts to accomplish same, unpaid or underpaid wages shall be reserved by the City in a special "unfound worker's account" established by the City of Leon Valley, for such employees. If after one (1) year from the final acceptance of the project by the City, workers still cannot be located, in order that the City can make effective interim re-use of the money, such wages, and any associated liquidated damages may be used to defray actual costs incurred by the City in attempting to locate said workers, and any remaining monies may then revert back to the City's original funding source for the project. However, unpaid or underpaid workers for whom money was originally reserved are eligible to claim recovery from the City for a period of not to exceed three (3) years from the final acceptance of the project by the City. Recovery after expiration of the three (3) year period is prohibited.

10 - POSTING WAGE DETERMINATION DECISIONS AND NOTICE TO LABORERS'/MECHANICS' STATEMENTS

The applicable wage determination decision as described in the "General Statement" (and as specifically included in each project contract), outlining the various workers' classifications and mandatory minimum wages and minimum hourly fringe benefits deductions, if any, of laborers/mechanics employed and to be employed upon the work covered by this Contract, shall be displayed by the CONTRACTOR/subcontractor at the

site of work a conspicuous and prominent public place, readily and routinely accessible to workmen for the duration of the project. In addition, the CONTRACTOR / subcontractor agrees with the contents of the following statement, and shall display same, in English and Spanish, near the display of the wage determination decision at the site of work:

“NOTICE TO LABORERS/MECHANICS

Both the City of Leon Valley and the CONTRACTOR/subcontractor agree that you must be compensated with not less than the minimum hourly base pay and minimum hourly fringe benefit contribution in accordance with the wage rates publicly posted at this job site, and as are applicable to the classification of work you perform.

Additionally, you must be paid not less than one and one-half times your basic hourly rate of pay for any hours worked over 40 in any seven (7) calendar day work period, and for any work conducted on New Year’s Day, Martin Luther King Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, and Christmas Day or the calendar days observed as such in any given year.

Apprentice and trainee hourly wage rates and ratios apply only to apprentices and trainees recognized under approved Federal, or State, apprenticeship training programs registered with the Bureau of Apprenticeship and Training, United States Department of Labor.

If you believe that your employer is not paying the posted minimum wage for the type of work you do, you must make direct inquiry to the employer and inquire in writing, within 60 days calendar days of your receipt of any allegedly incorrect wage or benefit check or report, to the City of Leon Valley Wage & Hour Monitor, 6400 El Verde, Leon Valley, Texas 78238.

It is mandatory that you promptly file written inquiry of any allegedly incorrect wage or benefit checks or reports with the City of Leon Valley Project Manager within the sixty (60) calendar day period, so that you do not waive your potential right of recovery under the provisions of the City of Leon Valley Public Works Contract that governs this project.”

Both the City of Leon Valley and the CONTRACTOR/subcontractor agree that no laborer/mechanic who files a complaint or inquiry concerning alleged underpayment of wages or benefits, shall be discharged by the employer, or in other manner be discriminated against by the employer, for filing such complaint or inquiry.

11 - PAYROLLS & BASIC PAYROLL RECORDS

A. The CONTRACTOR and each subcontractor shall prepare payroll reports in accordance with the “General Guideline” instructions furnished by the Wage & Hour Monitor of the City of Leon Valley. Such payroll submittals shall contain the name and address of each such employee, his correct labor classification, rate of pay, daily and weekly number of hours worked, any deductions made, and actual basic hourly and fringe benefits paid. The CONTRACTOR shall submit payroll records each week and no later than seven (7) working days following completion of the work week being processed to the Project Manager, City of Leon Valley. These payroll records shall include certified copies of all payrolls of the CONTRACTOR and of his subcontractors, it being understood that the

CONTRACTOR shall be responsible for the submission and general mathematical accuracy of payroll from all of his subcontractors. Each such payroll submittal shall be on forms deemed satisfactory to the City's Project Manager and shall contain a "Weekly Statement of Compliance", as called for by the Contract Documents. Such payrolls will be forwarded to Public Works, Project Manager, City of Leon Valley, 6400 El Verde, Leon Valley, Texas 78238.

B. Copies of payroll submittals and basic supporting payroll records of the CONTRACTOR/subcontractors accounting for all laborers/mechanics employed under the work covered by this Contract, shall be maintained by CONTRACTOR/subcontractor during the course of the work, and preserved for a period of three (3) years after completion of the project. The CONTRACTOR/subcontractor shall maintain records which demonstrate: any CONTRACTOR commitment to provide fringe benefits to employees as may be mandated by the applicable wage determination decision; that the plan or program is adjudged financially responsible by the appropriate approving authority, (i.e. United States Department of Labor, United States Department of Treasury, etc.); and that the provisions, policies, certificates, and description of benefits of the plan or program as may be periodically amended, have been clearly communicated in a timely manner and in writing, to the laborers/mechanics affected prior to their performing work on the project.

C. The CONTRACTOR/subcontractor shall make the above records available for inspection, copying, or transcribing by authorized representatives of the City of Leon Valley at reasonable times and locations for purposes of monitoring compliance with this Contract.

12 - LABOR DISPUTES

The CONTRACTOR/subcontractor shall immediately notify the City Manager or his designated representative of any actual or impending CONTRACTOR/subcontractor labor dispute which may affect, or is affecting, the schedule of the CONTRACTOR's or any other CONTRACTOR's or subcontractor's work. In addition, the CONTRACTOR/subcontractor shall consider all appropriate measures to eliminate or minimize the effect of such labor disputes on the schedule, including but not limited to such measures as: promptly seeking injunctive relief if appropriate; seeking appropriate legal equitable actions or remedies; taking such measures as establishing a reserved gate, as appropriate; if reasonable feasible, seeking other sources of supply or service; and any other measures that may be appropriately utilized to mitigate or eliminate the job site and scheduling effects of the labor dispute.

13 - COMPLAINTS, PROCEEDINGS, OR TESTIMONY BY EMPLOYEES

No laborers/mechanics to whom the wage, salary, or other labor standard provisions of this Contract are applicable shall be discharged, or in any other manner discriminated against by the CONTRACTOR/subcontractors, because such an employee has filed any formal inquiry or complaint or instituted or caused to be instituted, any legal or equitable proceeding, or has testified, or is about to testify, in any such proceeding under or relating to the wage and labor standards applicable under this Contract.

14 - "ANTI-KICKBACK" PROVISION

No person employed in the construction or repair of any City of Leon Valley Public Works Project shall be induced, by any means, to give up to any CONTRACTOR/subcontractor

or public official or employee, any part of the hourly and/or fringe benefit compensation to which he or she is otherwise entitled.

15 - "FALSE INFORMATION"

Any person employed by the CONTRACTOR/subcontractor in the construction or repair of any City of Leon Valley Public Works Project, who is proven to have knowingly and willfully falsified, concealed or covered up by any deceptive trick, scheme, or device a material fact, or made any false, fictitious or fraudulent statement or representation, or made or used any false writing or document knowing the same to contain any false, fictitious or fraudulent statement or entry, shall be permanently removed from the job site by CONTRACTOR/subcontractor. The City of Leon Valley reserves the right to terminate this Contract for cause as a result of serious and uncured violations of this provision.

16 - JOB SITE CONDITIONS

CONTRACTORS/subcontractors will not allow any person employed for the project to work in surroundings or under construction conditions which are unsanitary, unhealthy, hazardous, or dangerous as governed by industry standards and appropriate local, state and federal statutes, ordinances, and regulatory guidelines.

17 - EMPLOYMENT OF CERTAIN PERSONS PROHIBITED

A. The CONTRACTOR/subcontractor shall knowingly only employ persons of appropriate ages commensurate with the degree of required skill, strength, maturity and judgment associated with the activity to be engaged in, but not in less than the age of 14 years, as governed by Chapter 51 "Employment of Children", Texas Labor code, (Vernon's Texas Code Annotated) (as may be amended), and Texas Department of Labor and Standards rulings and interpretations associated with that statute. It is hereby noted that in some circumstances generally governed by this section, a federal statute (see: Fair Labor Standards Act, 29 USCS Section 212; Volume 6A of the Bureau of National Affairs Wages Hour Manual at Paragraph 96:1; "Child Labor Requirements in Non-agricultural Occupations" WH Publication 1330, July 1978 as may be amended), could pre-empt the Texas Statute and therefore be the controlling law on this subject. The CONTRACTOR/subcontractor should seek classification from state and federal agencies and legal counsel when hiring adolescent employees for particular job classifications.

B. Prohibited persons not to be employed are also those persons who, at the time of employment for this Contract, are serving sentence in a penal or correctional institution, except that prior approval by the City Manager is required to employ any person participating in a supervised work release or furlough program that is sanctioned by appropriate state and federal correctional agencies.

C. The CONTRACTOR/subcontractors shall be responsible for compliance with the provisions of the "Immigration Reform and Control Act of 1986" Public Law 99-603, and any related State enabling or implementing statutes, especially as they in combination apply to the unlawful employment of aliens and unfair immigration-related employment practices affecting this Contract.

18 - PROVISIONS TO BE INCLUDED IN SUBCONTRACTS

The CONTRACTOR shall cause these Wage and Labor Standard Provisions, or reasonably similar contextual adaptations hereof, and any other appropriate state and federal labor provisions, to be inserted in all subcontracts relative to the work to bind subcontractors to the same Wage and Labor Standards as contained in these terms of the General Conditions and other contract documents insofar as applicable to the work of subcontractors or sub-tier subcontractors, and to give the CONTRACTOR similar, if not greater, general contractual authority over the subcontractor, or sub-tier subcontractors, as the City of Leon Valley may exercise over the CONTRACTOR.

19 - GENERAL INDEPENDENT CONTRACTOR CLAUSE

This agreement does not create an employer relationship between parties. It is parties' intention that the CONTRACTOR will be an independent CONTRACTOR and not the City of Leon Valley employee for all purposes, including, but not limited to, the application of the Fair Labor Standards Act minimum wage and overtime payments, Federal Insurance Contribution Act, the Social Security Act, the Federal Unemployment Tax Act, the provisions of the Internal Revenue Code, Texas workers compensation law and Texas unemployment insurance law. The CONTRACTOR will retain sole and absolute discretion in the judgment of the manner and means of carrying out the CONTRACTOR's activities and responsibilities hereunder. The CONTRACTOR agrees that it is a separate and independent enterprise from the City of Leon Valley, that it has a full opportunity to find other business, that it has made its own investment in its business, and that it will utilize a high level of skill necessary to perform the work. This agreement shall not be construed as creating any joint employment relationship between the CONTRACTOR and the City of Leon Valley and the City of Leon Valley will not be liable for any obligation incurred by the CONTRACTOR, including, but not limited to unpaid minimum wages, and/or overtime premiums.

20 - HOT GOODS CLAUSE

The CONTRACTOR hereby certifies that the execution of the work he will perform, that he will comply with all applicable provisions of Sections 6, 7 and 12 of the Fair Labor Standards Act of 1938, as amended, and that there will be no violations of the "hot goods" or "hot cargo" provisions of the Act involving restrictions on the use of the underage employees.

21 - PROTECTION OF LIVES AND HEALTH

The CONTRACTOR shall comply with the U.S. Department of Labor Safety and Health Regulations for construction promulgated under the Occupational Safety and Health Act of 1970 (Public Law 91-596 and all subsequent amendments) and under Section 107 of the Contract Work Hours and Safety Standards Act (Public Law 91-54 and all subsequent amendments).

The CONTRACTOR shall have a competent person or persons, as required under the Occupational Safety and Health Act, on the site to inspect the work and to supervise the conformance of the CONTRACTOR's operations with the regulations of the Act.

This project is subject to all of the Safety and Health Regulations CFR 29, Part 1926 and all subsequent amendments) as promulgated by the U.S. Department of Labor on June 24, 1974, and CFR 29, Part 1910 and all subsequent amendments of General Industry

Safety and Health Regulations identified as applicable to construction. CONTRACTORS are urged to become familiar with the requirements of these regulations.

22 - ANTI-DISCRIMINATION IN EMPLOYMENT

A. The CONTRACTOR and/or any subcontractor(s), if permitted, certifies complete compliance with the Federal Civil Rights Law and the Americans with Disabilities Act, agreeing to nondiscrimination based on race, age, color, religion, disability, gender, ancestry, national origin, or place of birth.

In employment practices, programs and services shall include but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination, rates of pay or other compensation; and selection for training, including apprenticeship.

B. The CONTRACTOR shall in all solicitations or advertisements for employees placed by or on behalf of the CONTRACTOR, state that all qualified applicants will receive consideration for employment without regard to race, age, color, religion, disability, gender, ancestry, national origin, or place of birth.

SECTION 8 OTHER CONDITIONS

1 - MATERIAL SUBMITTAL

The Contractor will supply three copies of submittal data for approval prior to ordering any material for the project.

2 - SCHEDULE OF WORK

At the Preconstruction Conference, the sequence of work will be proposed by the Contractor to the City and is subject to City approval. Work will be allowed from 7:30 a.m. to 6:00 p.m., Monday through Friday. No work on Saturday, Sunday, or City Holidays will be permitted, unless approved by the Director of Public Works. The contractor will not receive a notice to proceed with the work until utility and City preparation work is complete.

3 - SEQUENCE OF WORK

The Contractor shall proceed with work in a manner which completes the work in one area before advancing to another area. The Contractor may have under construction several sites so as to be efficient; however, the sequence must proceed in an orderly manner to completion. The Contractor's sequence must also include traffic flow consideration. Sequences of work which do not include orderly progression through these stages before advancing to additional work areas will not be approved.

4 - NOTIFICATION

It shall be the Contractor's responsibility to notify all property owners adjacent to the project seven (7) days prior to the starting of construction operations. This notice shall be in writing in a form acceptable to the City. Additionally, 48 hours prior to beginning work, notify the following departments: U.S. Post Office (210) 641-0248, N.I.S.D. Transportation (210) 695- 3800, Waste Management Co. (210) 368-5005, Leon Valley Dispatch (210) 684-3215.

5 - STREET CLOSING

The contractor is to properly barricade each segment of street to be worked on after giving property owners no more than 72-hour notice, but no less than 24-hour notice. Barricades will not be set before 7:30 a.m. Each street shall be opened at the end of day.

6 - BARRICADES AND FLAGMEN

The Contractor is to provide himself with necessary temporary barricades and traffic cones sufficient to alert the traffic in advance. If the present lanes of traffic are to be closed, suitable barricades, warning signs and markers are to be provided by the Contractor. Unless otherwise approved by the City, barricades for this work shall be provided by a barricade company familiar with the requirements of TMUTCD.

Barricades and traffic control devices including advance warning signs etc, shall follow the Texas Uniform Municipal Control Devices standards to the satisfaction of the City must be utilized. The City has the right to prevent work from starting until suitable traffic control devices are provided, in the opinion of the City. Included advance warning signs.

The City may direct the Contractor to provide additional traffic control devices and/or flagmen as they deem necessary to protect the public. All barricades will have one flashing light at night. All cost for traffic management and barricades will be included in the cost of the work.

7 - WATER FOR CONSTRUCTION

All water required by the Contractor for his operations will be available without charge at the City Public Works yard. The Contractor shall make all necessary connections and shall transport all water at his own expense. If needed, the Contractor will be required to pay a deposit for a fire hydrant meter, which deposit will be returned when the fire hydrant meter is returned in good condition.

8 - BID QUANTITIES

The Owner may elect to increase or decrease the amount of work units authorized to be completed as much as 25% without affecting the unit price of the project. The Contractor agrees that the final contract amount will be computed by extension of these unit prices and the quantity of work authorized and accepted by the Owner.

9 - UTILITY AND SIGN ADJUSTMENT

The Contractor is required to make all arrangements and coordinate with the various utility companies for preserving and adjusting the various valves and manholes on the project. The City of Leon Valley shall adjust all water valves and sewer manholes. Those valves and manholes which do not belong to the City of Leon Valley will be adjusted by the utility owner. In every case, the contractor shall protect these utilities from being damaged.

10 - WATER VALVE COVERS, MANHOLES, AND STREET REFLECTORS

The Contractor shall protect existing water valve covers, manhole lids, and street reflectors from being coated by work. Before completion of the work, the contractor shall remove any material placed over these facilities.

11 - INSPECTION

This work will be inspected by the City and all change orders or communication concerning the work shall be directed to the City.

12 - DAMAGE TO EXISTING STREETS

The asphalt pavement, curbs and existing sidewalks in the work area are considered to be in good to excellent condition prior to start of the project.

Any scars, nicks, gasoline, oil, etc., or other defacement or damage to the existing streets, curbs or sidewalks will be a responsibility of the contractor to repair.

Before beginning the job, the contractor may point out and note to the inspector any specific areas that are already damaged. Thereafter, the contractor will not be held responsible for repairs to these areas.

13 - CONDITION OF THE SITE

Site of the proposed work will be pointed out to the prospective bidders by the City Public Works Director. The Contractor shall provide his own material and equipment yard at his cost. Upon completion of the work, all excess materials shall be removed from the site by the Contractor and the area around the work shall be returned to its original condition. Disposal sites will be a responsibility of the Contractor.

14 - PROTECTION OF WORK, PROPERTY AND PERSONS

The Contractor shall, at all times, safely guard the Owner's property from injury or loss in connection with this Contract. He shall at all times safely guard and protect his own work and that of adjacent property from damage. The Contractor shall replace or make good any such damage, loss or injury unless such is caused directly by errors contained in the Contract, or by the Owner or his duly authorized representatives.

The Contractor shall take all necessary precautions for the safety of employees on the work and shall comply with all applicable provisions of Federal, State and Municipal safety laws and building codes to prevent accidents or injury to persons on, about or adjacent to the premises where the work is being performed. He shall erect and properly maintain at all times, as required by the conditions and progress of the work, all necessary safeguards for the protection of workmen and the public, and shall post danger signs warning against the hazards created by such features of construction as protruding nails, hoists, well holes, elevator hatchways, scaffolding, window openings, stairways, trenches and other excavations, and falling materials, and he shall designate a responsible member of his organization on the work site whose duty shall be the prevention of accidents. The name and position of any person so designated shall be reported to the Owner by the Contractor. The person so designated shall be available by phone during non-working hours.

In case of an emergency which threatens loss or injury of property and/or safety of life, the Contractor will be allowed to act without previous instructions from the Owner in a diligent manner. He shall notify the Owner immediately thereafter.

15 - CARE AND PROTECTION OF PROPERTY

The Contractor expressly undertakes at his own expense: To assume full responsibility for the preservation of all public and private property and use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect or misconduct in the execution of the work on the part of the Contractor, such property shall be restored by the Contractor, at his expense, to a condition similar to or equal to that existing before the damage was done, or he shall make good the damage in another manner acceptable to the Owner. No representations are made concerning the conditions, locations or state of repair of existing sewers, drains, water mains and other underground structures;

To store his apparatus, materials, supplies and equipment in such orderly fashion at the site of the work as will not unduly interfere with the progress of his work or the work of any other contractor;

To provide suitable storage facilities for all materials which are liable to injury by exposure to weather, theft, and breakage or otherwise;

To place upon the work, or any part thereof, only such loads as are consistent with safety of that portion of the work;

To clean up frequently all refuse, rubbish, scrap materials and debris caused by his operations to the end that at all times the site of the work shall present a neat, orderly and workmanlike appearance;

To remove all surplus material, false work, temporary structures, including foundations thereof, plant of any description and debris of every nature resulting from his operations and to put the site in a neat, orderly condition before final payment; to effect all cutting, fitting or patching of his work required to make the same conform to the plans and specifications and, except with the consent of the Owner, not to cut or otherwise alter the work of any other contractor.

The Contractor shall not, except after written consent from proper parties, enter or occupy with men, tools, materials or equipment, any privately owned land except on easements provided herein.

16 - PROTECTION OF LIVES AND HEALTH

The Contractor shall comply with the U.S. Department of Labor Safety and Health Regulations for construction promulgated under the Occupational Safety and Health Act of 1970 (Public Law 91 - 596 and all subsequent amendments) and under Section 107 of the Contract Work Hours and Safety Standards Act (Public Law 91-54 and all subsequent amendments).

The Contractor shall have a competent person or persons, as required under the Occupational Safety and Health Act, on the site to inspect the work and to supervise the conformance of the Contractor's operations with the regulations of the Act. This project is subject to all of the Safety and Health Regulations (CFR 29, Part 1926 and all subsequent amendments) as promulgated by the U.S. Department of Labor on June 24, 1974, and CFR 29, Part 1910 and all subsequent amendments of General Industry Safety and Health Regulations identified as applicable to construction. Contractors are urged to become familiar with the requirements of these regulations.

17 - PROJECT CONSTRUCTION SITE

The contractor shall provide his own temporary yard for stock pile of materials and storage of vehicle. City property may not be available for this purpose.

AN ORDINANCE REPEALING AND REPLACING ORDINANCE NUMBER 2014-02-10-02 PROVIDING FOR A MINIMUM PREVAILING WAGE BY ADOPTING PREVAILING WAGE RATES FOR PUBLIC WORKS CONSTRUCTION AS DETERMINED BY THE U.S. DEPARTMENT OF LABOR, AND OTHER MATTERS IN CONNECTION THEREWITH.

WHEREAS, the City of Leon Valley (the "City") is required by Chapter 2258 of the Texas Government Code to determine the prevailing rate of per diem, and a prevailing rate for legal holiday and overtime work, in the locality for each craft and type of worker needed to perform a contract for public works construction; and

WHEREAS, Chapter 2258 allow municipalities to use prevailing wage rates as determined by the U.S. Department of Labor in accordance with the Davis-Bacon Act (40 U.S.C. Section 276a, et seq.), and its subsequent amendments, in lieu of conducting wage rate surveys and compiling wage rate schedules;

NOW THEREFORE BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF LEON VALLEY, TEXAS THAT:

Section 1. The City Council hereby elects to use the prevailing wage rates as determined by the U.S. Department of Labor in accordance with the Davis-Bacon Act (40 U.S.C Section 276a, et seq.), and its subsequent amendments, in lieu of conducting wage rate surveys and compiling wage rate schedules.

Section 2. If and when the U.S. Department of Labor's wages rate schedule may be revised, updated, or amended, such revisions, updates and amendments shall automatically apply for the construction of public works in the City, but shall not be applied or enforced retroactively to any public works project for which a formal agreement has been executed prior to the revision, update or amendment.

Section 3. The recitals contained in the preamble hereof are hereby found to be true, and such recitals are hereby made a part of this Ordinance are hereby repealed to the extent of such conflict, and the provisions of this Ordinance shall be and remain controlling as to the matters resolved herein.

Section 4. All Ordinances or parts thereof, which are in conflict or inconsistent with any provision of this Ordinance is hereby repealed to the extent of such conflict, and the provisions of this Ordinance shall be and remain controlling as to the matters resolved herein.

Section 5. This Ordinance shall be construed and enforced in accordance with the laws of the State of Texas and the United States of America.

Section 6. If any provision of this Ordinance or the application thereof to any person or circumstance shall be held to be invalid, the remainder of this Ordinance and the application of such provision to other persons and circumstances shall nevertheless be valid, and the City Council hereby declares that this Ordinance would have been enacted without such invalid provision.

Section 7. It is officially found, determined, and declared that the meeting at which this Ordinance is adopted was open to the public and public notice of the time, place, and subject matter of the public business to be considered at such meeting, including this Ordinance, was given, all as required by Chapter 551, Texas Government Code, as amended.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF LEON VALLEY, TEXAS:

That Ordinance Number 2014-02-10-02 is hereby amended by Ordinance No. 16-005 repealing the replacing the existing ordinance and exhibits.

PASSED, ADOPTED AND APPROVED by the City Council of the City of Leon Valley this the 16th day of February, 2016.

APPROVED


CHRIS RILEY
MAYOR

Attest:


SAUNDRA PASSAILAIGUE, TRMC
City Secretary

Approved as to Form:


ROXANN PAIS COTRONEO
City Attorney



"General Decision Number: TX20230007 01/06/2023

Superseded General Decision Number: TX20220007

State: Texas

Construction Types: Heavy and Highway

Counties: Atascosa, Bandera, Bastrop, Bell, Bexar, Brazos, Burleson, Caldwell, Comal, Coryell, Guadalupe, Hays, Kendall, Lampasas, McLennan, Medina, Robertson, Travis, Williamson and Wilson Counties in Texas.

HEAVY (excluding tunnels and dams, not to be used for work on Sewage or Water Treatment Plants or Lift / Pump Stations in Bell, Coryell, McClennon and Williamson Counties) and HIGHWAY Construction Projects

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60).

| | |
|---|--|
| If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022: | <ul style="list-style-type: none"> • Executive Order 14026 generally applies to the contract. • The contractor must pay all covered workers at least \$16.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2023. |
| If the contract was awarded on or between January 1, 2015 and January 29, 2022 and the contract is not renewed or extended on or after January 30, 2022: | <ul style="list-style-type: none"> • Executive Order 13658 generally applies to the contract. • The contractor must pay all covered workers at least \$12.15 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing that contract in 2023. |

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Modification Number

0

Publication Date

01/06/2024

* SUTX2011-006 08/03/2011

| | Rates | Fringes |
|--|------------|---------|
| CEMENT MASON/CONCRETE FINISHER (Paving and Structures) | \$12.56 ** | 0 |
| ELECTRICIAN | \$26.35 | 0 |

FORM BUILDER/FORM SETTER

| | | |
|--------------------------|------------|---|
| Paving & Curb Structures | \$12.94 ** | 0 |
| | \$12.87 ** | 0 |

LABORER

| | | |
|------------------------------|------------|---|
| Asphalt Raker | \$12.12 ** | 0 |
| Flagger | \$9.45 ** | 0 |
| Laborer, Common | \$10.5 ** | 0 |
| Laborer, Utility | \$12.27 ** | 0 |
| Pipelayer | \$12.79 ** | 0 |
| Work Zone Barricade Servicer | \$11.85 ** | 0 |

| | | |
|----------------------|---------|---|
| PAINTER (Structures) | \$18.34 | 0 |
|----------------------|---------|---|

POWER EQUIPMENT OPERATOR:

| | | |
|-------------------------------------|------------|---|
| Agricultural Tractor | \$12.69 ** | 0 |
| Asphalt Distributor | \$15.55 | 0 |
| Asphalt Paving Machine | \$14.36 ** | 0 |
| Boom Truck | \$18.36 | 0 |
| Broom or Sweeper | \$11.04 ** | 0 |
| Concrete Pavement Finishing Machine | \$15.48 | 0 |
| Crane, Hydraulic 80 tons or less | \$18.36 | 0 |
| Crane, Lattice Boom 80 tons or less | \$15.87 | 0 |
| Crane, Lattice Boom over 80 tons | \$19.38 | 0 |
| Crawler Tractor | \$15.67 | 0 |
| Directional Drilling Locator | \$11.67 ** | 0 |
| Directional Drilling Operator | \$17.24 | 0 |
| Excavator 50,000 lbs or Less | \$12.88 ** | 0 |
| Excavator over 50,000 lbs | \$17.71 | 0 |
| Foundation Drill, Truck Mounted | \$16.93 | 0 |
| Front End Loader, 3 CY or Less | \$13.04 ** | 0 |
| Front End Loader, Over 3 CY | \$13.21 ** | 0 |
| Loader/Backhoe.12 | \$14.12 ** | 0 |
| Mechanic | \$17.10 | 0 |
| Milling Machine | \$14.18 ** | 0 |
| Motor Grader, Fine Grade | \$18.51 | 0 |
| Motor Grader, Rough | \$14.63 ** | 0 |
| Pavement Marking Machine | \$19.17 | 0 |
| Reclaimer/Pulverizer | \$12.88 ** | 0 |
| Roller, Asphalt | \$12.78 ** | 0 |
| Roller, Other | \$10.50 ** | 0 |
| Scraper | \$12.27 ** | 0 |
| Spreader Box | \$14.04 ** | 0 |
| Trenching Machine, Heavy | \$18.48 | 0 |
| Servicer | \$14.51 ** | 0 |

| | | |
|------------------------------------|------------|---|
| Steel Worker | | |
| Reinforcing | \$14.00 ** | 0 |
| Structural | \$19.29 | 0 |
| TRAFFIC SIGNAL INSTALLER | | |
| Traffic Signal/Light Pole Worker | \$16.00 | 0 |
| TRUCK DRIVER | | |
| Lowboy-Float | \$15.66 | 0 |
| Off Road Hauler | \$11.88 ** | 0 |
| Single Axle | \$11.79 ** | 0 |
| Single or Tandem Axle Dump Truck | \$11.68 ** | 0 |
| Tandem Axle Tractor w/Semi Trailer | \$12.81 ** | 0 |
| WELDER | \$15.97 | 0 |

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

=====
** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 (\$16.20) or 13658 (\$12.15). Please see the Note at the top of the wage determination for more information.

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

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

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

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those

classifications: however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour National Office because National Office has responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

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

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

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

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

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

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

4.) All decisions by the Administrative Review Board are final.

=====

END OF GENERAL DECISION"

ATTACHMENT B BID FORM

PROJECT IDENTIFICATION:

**City of Leon Valley
Bid #2024-01**

CDBG EAST OF WURZBACH SEWER MAIN

THIS BID IS SUBMITTED TO:

City of Leon Valley
Public Works Director
6400 El Verde
Leon Valley, TX 78238

1.1 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with OWNER in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

2.1 Bidder accepts all of the terms and conditions of the Advertisement or Invitation to Bid and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. The Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of OWNER.

3.1 In submitting this Bid, Bidder represents, as set forth in the Agreement, that:

A. Bidder has examined and carefully studied the Bidding Documents, the other related data identified in the Bidding Documents, and the following Addenda, receipt of all which is hereby acknowledged.

| Addendum No. | Addendum Date |
|--------------|---------------|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

B. Bidder has visited the Site and become familiar with and is satisfied as to the general, local and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress and performance of the Work.

D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) which have been identified

in the Supplementary Conditions as provided in the General Conditions, and (2) reports and drawings of a Hazardous Environmental Condition, if any, which has been identified in the Supplementary Conditions as provided in the General Conditions.

E. Bidder has obtained and carefully studied (or assumes responsibility for having done so) all additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents to be employed by Bidder, and safety precautions and programs incident thereto.

F. Bidder does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the Bidding Documents.

G. Bidder is aware of the general nature of work to be performed by OWNER and others at the Site that relates to the Work as indicated in the Bidding Documents.

H. Bidder has correlated the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents.

I. Bidder has given OWNER written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by OWNER is acceptable to Bidder.

J. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.

4.1 Bidder further represents that this Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; Bidder has not solicited or induced any individual or entity to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.

5.1 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

6.1 Bidder agrees that the Work will be substantially completed and completed and ready for final payment in accordance with the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.

6.2 Bidder accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work within the times specified above, which shall be stated in the Agreement.

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

- A. Required Bid Bond;
- B. Required bidder qualifications statement with supporting data.
- C. Evidence of Workers Compensation Insurance

8.1 The terms used in this Bid with initial capital letters have the meanings indicated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

SUBMITTED on _____, 2024.

State Contractor License No. _____ (If applicable) If Bidder is:

An Individual

Name (typed or clearly printed): _____

By: _____ (SEAL)
(Individual's signature)

Doing business as: _____

Business address: _____

Phone No.: _____ FAX No.: _____

A Partnership

Partnership Name: _____ (SEAL)

By: _____
(Signature of general partner -- attach evidence of authority to sign)

Name (typed or clearly printed): _____

Business address: _____

Phone No.: _____ FAX No.: _____

A Corporation

Corporation Name: _____ (SEAL)

State of Incorporation: _____

Type (General Business, Professional, Service, Limited Liability): _____

By: _____
(Signature -- attach evidence of authority to sign)

Name (typed or clearly printed): _____

Title: _____
(CORPORATE SEAL)

Attest _____
(Signature of Corporate Secretary)

Business address: _____

Phone No.: _____ FAX No.: _____

Date of Qualification to do business is _____

A Joint Venture

Joint Venturer Name: _____ (SEAL)

By: _____
(Signature of joint venture partner -- attach evidence of authority to sign)

Name (typed or clearly printed): _____

Title: _____

Business address: _____

Phone No.: _____ FAX No.: _____

Joint Venturer Name: _____ (SEAL)

By: _____
(Signature -- attach evidence of authority to sign)

Name (typed or clearly printed): _____

Title: _____

Business address: _____

Phone No.: _____ FAX No.: _____

Phone, Fax number, email, and mail address for receipt of official communications:

(Each joint venturer must sign. The manner of signing for each individual, partnership, and corporation that is a party to the joint venture should be in the manner indicated above.)

UNIT PRICE BID ITEMS

Bid #2024-01 CDBG EAST OF WURZBACH SEWER MAIN

BASE BID

Amounts are to be shown in both words and numeric figures. In case of discrepancy, the amount shown in words will govern.

| ITEM | DESCRIPTION | QTY | UNITS | UNIT PRICE | TOTAL PRICE |
|------|--------------|-----|-------|------------|-------------|
| 100 | MOBILIZATION | 1 | LS | \$ | \$ |

Price/LS _____ dollars

and _____ cents

Total Price _____ dollars

and _____ cents

| ITEM | DESCRIPTION | QTY | UNITS | UNIT PRICE | TOTAL PRICE |
|------|--------------------------------|-----|-------|------------|-------------|
| 101 | PREPARATION OF RIGHT-OF WAY | 1 | LS | \$ | \$ |

Price/LS _____ dollars

and _____ cents

Total Price _____ dollars

and _____ cents

| ITEM | DESCRIPTION | QTY | UNITS | UNIT PRICE | TOTAL PRICE |
|------|--|-----|-------|------------|-------------|
| 205 | HOT MIX ASPHALTIC CONCRETE PAVEMENT (12" TYPE B) | 4 | SY | \$ | \$ |

Price/SY _____
dollars

and _____ cents

Total Price _____
dollars

and _____ cents

| ITEM | DESCRIPTION | QTY | UNITS | UNIT PRICE | TOTAL PRICE |
|------|---|-----|-------|------------|-------------|
| 205 | HOT MIX ASPHALTIC CONCRETE PAVEMENT (3" TYPE D) | 5 | SY | \$ | \$ |

Price/SY _____
dollars

and _____ cents

Total Price _____
dollars

and _____ cents

| ITEM | DESCRIPTION | QTY | UNITS | UNIT PRICE | TOTAL PRICE |
|------|----------------------------------|-----|-------|------------|-------------|
| 299 | FLOWABLE FILL (HIGH STRENGTH) | 11 | CY | \$ | \$ |

Price/SY _____
dollars

and _____ cents

Total Price _____
dollars

and _____ cents

| ITEM | DESCRIPTION | QTY | UNITS | UNIT PRICE | TOTAL PRICE |
|------|---|-----|-------|------------|-------------|
| 530 | BARRICADES, SIGNS & TRAFFIC HANDLING | 1 | LS | \$ | \$ |

Price/LS _____
dollars

and _____ cents

Total Price _____
dollars

and _____ cents

| ITEM | DESCRIPTION | QTY | UNITS | UNIT PRICE | TOTAL PRICE |
|------|--|-----|-------|------------|-------------|
| 550 | TRENCH EXCAVATION SAFETY PROTECTION | 10 | LF | \$ | \$ |

Price/LF _____
dollars

and _____ cents

Total Price _____
dollars

and _____ cents

| ITEM | DESCRIPTION | QTY | UNITS | UNIT PRICE | TOTAL PRICE |
|------|---|-----|-------|------------|-------------|
| 865 | BYPASS PUMPING, SMALL DIAMETER SANITARY SEWER | 1 | LS | \$ | \$ |

Price/LS _____
dollars

and _____ cents

Total Price _____
dollars

and _____ cents

| ITEM | DESCRIPTION | QTY | UNITS | UNIT PRICE | TOTAL PRICE |
|------|--|-----|-------|------------|-------------|
| 866 | PRE-CONSTRUCTION SANITARY SEWER MAIN TELEVISION INSPECTION (8"-15" MAIN) | 537 | LF | \$ | \$ |

Price/LF _____
dollars

and _____ cents

Total Price _____
dollars

and _____ cents

| ITEM | DESCRIPTION | QTY | UNITS | UNIT PRICE | TOTAL PRICE |
|------|---|-----|-------|------------|-------------|
| 866 | POST-CONSTRUCTION SANITARY SEWER MAIN TELEVISION INSPECTION (8"-15" MAIN) | 537 | LF | \$ | \$ |

Price/LF _____
dollars

and _____ cents

Total Price _____
dollars

and _____ cents

| ITEM | DESCRIPTION | QTY | UNITS | UNIT PRICE | TOTAL PRICE |
|------|---|-----|-------|------------|-------------|
| 901 | 8" CIPP SANITARY SEWER PIPE, ALL DEPTHS | 527 | LF | \$ | \$ |

Price/LF _____
dollars

and _____ cents

Total Price _____
dollars

and _____ cents

| ITEM | DESCRIPTION | QTY | UNITS | UNIT PRICE | TOTAL PRICE |
|------|---|-----|-------|------------|-------------|
| 910 | MANHOLE REHABILITATION (INCLUDES REPLACEMENT OF RING & COVER) | 20 | VF | \$ | \$ |

Price/VF _____
dollars

and _____ cents

Total Price _____
dollars

and _____ cents

| ITEM | DESCRIPTION | QTY | UNITS | UNIT PRICE | TOTAL PRICE |
|------|---|-----|-------|------------|-------------|
| 1103 | 10' POINT REPAIR FOR 8" DIA. (ALL DEPTHS) | 3 | EA | \$ | \$ |

Price/EA _____
dollars

and _____ cents

Total Price _____
dollars

and _____ cents

| ITEM | DESCRIPTION | QTY | UNITS | UNIT PRICE | TOTAL PRICE |
|------|---|-----|-------|------------|-------------|
| 1109 | SERVICE RECONNECTION, ALL DEPTHS (W/ REMOTE CONTROL CUTTING DEVICE) | 1 | EA | \$ | \$ |

Price/EA _____
dollars

and _____ cents

Total Price _____
dollars

and _____ cents

Total Base Bid to be shown in both words and numeric figures.

In case of discrepancy, the amount shown in words will govern.

Total Base Bid: _____

_____ Dollars

and _____ cents

BIDDER

SURETY

(SEAL)
Bidder's Name and Corporate Seal

(SEAL)
Surety's Name and Corporate Seal

By: _____
Signature and Title

By: _____
Signature and Title
(Attach Power of Attorney)

Attest: _____
Signature and Title

Attest: _____
Signature and Title

Note: (1) Above addresses are to be used for giving required notice.
(2) Any singular reference to Bidder, Surety, OWNER or other party shall be considered plural where applicable.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to pay to OWNER upon default of Bidder the penal sum set forth on the face of this Bond.

2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by OWNER) the executed Agreement required by the Bidding Documents and any performance and payment Bonds required by the Bidding Documents.

3. This obligation shall be null and void if:

3.1 OWNER accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by OWNER) the executed Agreement required by the Bidding Documents and any performance and payment Bonds required by the Bidding Documents, or

3.2 All Bids are rejected by OWNER, or

3.3 OWNER fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required).

4. Payment under this Bond will be due and payable upon default by Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from OWNER, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.

5. Surety waives notice of and any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by OWNER and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.

6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required above is received by Bidder and Surety and in no case later than one year after Bid due date.

7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power or Attorney evidencing the authority of the officer, agent or representative who executed this Bond on behalf of Surety to execute, seal and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer or proposal as applicable.

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

THIS AGREEMENT is by and between the City of Leon Valley (hereinafter called OWNER) and _____ (hereinafter called CONTRACTOR).

OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

1 - WORK

1.1 CONTRACTOR shall complete all work as specified or indicated in the Contract Documents. The Work is generally described as follows: **BID #2024-01 CDBG EAST OF WURZBACH SEWER MAIN**

2 - THE PROJECT

2.1 The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows:

Base Bid: The proposed project involves sanitary sewer main improvements. The proposal includes 527 LF of cured-in-place pipe sewer main, 10 LF point repair with trench repair, and the rehabilitation of 20 VF of existing manholes.

3 - OWNER

3.1 The Project has been designed by OWNER.

4 - CONTRACT TIMES

4.1 Time is of the Essence

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

4.2 Dates for Substantial Completion and Final Payment

The Work will be substantially completed within 60 days after issuance of a Notice to Proceed and completed and ready for final payment within 90 days after the issuance of a Notice to Proceed

5 - CONTRACT PRICE

5.1 OWNER shall pay CONTRACTOR for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amounts determined below:

A. For all Work, at the prices stated in CONTRACTOR's Bid, for the alternatives or base bid indicated in the Notice of Award.

B. As provided in the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by CONTRACTOR as provided in the General Conditions. Unit prices have been computed as provided in the General Conditions.

C. STATEMENT OF MATERIALS AND OTHER CHARGES: For the purposes of complying with the Texas Tax Code, this contract shall be a separate contract. Separate prices for materials and services shall be provided by the CONTRACTOR upon award as provided.

D. The OWNER shall pay the CONTRACTOR for the proper performance of the contract, subject to additions and deductions provided herein.

E. CONTRACTOR hereby acknowledges and understands that this is a "separate contract" pursuant to recently enacted legislation contained in Texas Administrative Code Title 34, I, 3, O, paragraph 3.291. The following amount of money represents that part of the total contract price representative of the value of tangible personal property to be physically incorporated into the project reality:

\$_____.

6 - PAYMENT PROCEDURES

6.1 Submittal and Processing of Payments

CONTRACTOR shall submit Applications for Payment in accordance with the General Conditions. Applications for Payment will be processed by OWNER as provided in the General Conditions.

6.2 Progress Payments; Retainage

A. OWNER shall make progress payments on account of the Contract Price on the basis of CONTRACTOR's Applications for Payment on or about the 20th day of each month during performance of the Work as provided below. All such payments will be measured by the schedule of values established in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no schedule of values, as provided in the General Requirements:

B. The amount of the payment due the CONTRACTOR shall be determined by adding the total value of work completed to date and deducting of:

1. Ten percent (10%) of the total amount, to be retained by the OWNER until the final payment, and
2. The amount of all previous payments.

The total value of work completed to date shall be based on the estimated quantities of work completed and on the unit prices contained in the agreement. The estimate may include the value of materials delivered on the ground but not incorporated into the work.

C. Monthly or partial payments made by OWNER to CONTRACTOR are monies for the purpose of assisting CONTRACTOR to expedite the work of construction. The CONTRACTOR shall be responsible for the care and protection of all material and work upon which payments have been made until final acceptance of such work and materials by the OWNER. Such payments shall not constitute a waiver of the right of the OWNER to require the fulfillment of all terms of the agreement and the delivery of all improvements embraced in the agreement, complete and satisfactory to the OWNER in all details.

D. No payment application except the final request will be made for a sum less than Five Hundred Dollars (\$500). It is understood that all payment applications are approximate only and payment shall be subject to correction in subsequent payment applications if any error is discerned.

E. Contractor shall provide a completed IRS form W-9 to the City **BEFORE** any payment is made. The completed W-9 may be submitted in person or may be emailed to the Accounts Payable office at ap@leonvalleytexas.gov with "W-9 from (*insert vendor name*) for Grass Hill Generator Bid". Once the contract is awarded by Council, you may submit your W-9 immediately. Failure to submit a completed W-9 will delay payment. A blank W-9 is available here: <https://www.irs.gov/pub/irs-pdf/fw9.pdf>.

6.3 Final Payment

Upon final completion and acceptance of the Work, OWNER shall pay the remainder of the Contract Price as provided.

7 - INTEREST

7.1 All moneys not paid when due as provided in the General Conditions shall bear interest at the rate of 0 % per annum.

8 - CONTRACTOR'S REPRESENTATIONS

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

A. CONTRACTOR has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.

B. CONTRACTOR has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. CONTRACTOR is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.

D. CONTRACTOR has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) which have been identified in the Supplementary Conditions as provided in the General Conditions and (2) reports and drawings of a Hazardous Environmental Condition, if any, at the Site which has been identified in the Supplementary Conditions as provided in the General Conditions.

E. CONTRACTOR has obtained and carefully studied (or assumes responsibility for having done so) all additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by CONTRACTOR, including applying the specific means, methods, techniques, sequences, and procedures of construction, if any, expressly required by the Contract Documents to be employed by CONTRACTOR, and safety precautions and programs incident thereto.

F. CONTRACTOR does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.

G. CONTRACTOR is aware of the general nature of work to be performed by OWNER and others at the Site that relates to the Work as indicated in the Contract Documents.

H. CONTRACTOR has correlated the information known to CONTRACTOR, information and observations obtained from visits to the Site, reports and drawings identified in the Contract Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Contract Documents.

I. CONTRACTOR has given OWNER written notice of all conflicts, errors, ambiguities, or discrepancies that CONTRACTOR has discovered in the Contract Documents, and the written resolution thereof by OWNER is acceptable to CONTRACTOR.

J. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

K. For the purpose of complying with the Texas Tax Code, this contract shall be a separate contract. The OWNER shall pay the CONTRACTOR for the proper performance of the contract, subject to additions and deductions therein, the contract sum as provided on the Bid Form.

9 - CONTRACT DOCUMENTS

9.1 Contents

A. The Contract Documents consist of the following:

1. Instruction to Bidders
2. Bid Bonds
3. This Agreement
4. Performance Bond
5. Payment Bond
6. General Conditions

7. Supplementary Conditions
8. Special Supplementary Conditions
9. Special Conditions
10. Specifications as listed in the table of contents of the Project Manual
11. Addenda (numbers _____ to _____, inclusive)
12. Exhibits to this Agreement (enumerated as follows):
 - a. Notice to Proceed
 - b. CONTRACTOR's Bid;
 - c. Documentation submitted by CONTRACTOR prior to Notice of Award;
 - i. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:
 - a. Written Amendments;
 - b. Work Change Directives;
 - c. Change Order(s).
 - ii. The documents listed are attached to this Agreement (except as expressly noted otherwise above).
 - iii. There are no Contract Documents other than those listed above.
 - iv. The Contract Documents may only be amended, modified, or supplemented as provided in the General Conditions.

10 - MISCELLANEOUS

10.1 *Terms* - Terms used in this Agreement will have the meanings indicated in the General Conditions.

10.2 *Assignment of Contract* - No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

10.3 *Successors and Assigns:*

OWNER and CONTRACTOR each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and

legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

10.4 *Severability*

Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon OWNER and CONTRACTOR, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

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

This Agreement will be effective on _____ (which is the Effective Date of the Agreement).

OWNER: City of Leon Valley

CONTRACTOR:

By: _____

By: _____

[CORPORATE SEAL]

[CORPORATE SEAL]

Attest _____

Attest _____

Address for giving notices:

Address for giving notices:

City of Leon Valley

6400 El Verde

Leon Valley, Texas 78238

Designated Representative:

Designated Representative:

Name: _____

Name: _____

Title: City Manager

Title: _____

Address: 6400 El Verde

Address: _____

Leon Valley, Texas 78238

Phone: (210) 684-1391

Phone: _____

Facsimile: (210) 684-4476

Facsimile: _____

ATTACHMENT E NOTICE TO PROCEED

Date: _____

TO: _____

(CONTRACTOR)

ADDRESS: _____

Contract: BID #2024-01 CDBG EAST OF WURZBACH SEWER MAIN

Project: BID #2024-01 CDBG EAST OF WURZBACH SEWER MAIN

OWNER'S CONTRACT NO. 2024-01

You are notified that the Contract Times under the above contract will commence to run on _____. By that date, you are to start performing your obligations under the Contract Documents. In accordance with the Agreement the date of Substantial Completion is _____ and the date of readiness for final payment is _____. Before starting any Work at the Site, the General Conditions provides that you and Owner must each deliver to the other certificates of insurance which each is required to purchase and maintain in accordance with the Contract Documents. Also, before you may start any Work at the Site, you must:

Attend Preconstruction Conference and give Owner actual notice of start. Provide new Insurance certificate prior to expiration of current insurance.

City of Leon Valley

By: _____

(AUTHORIZED SIGNATURE)

Title: City Manager

1. The CONTRACTOR and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Contract, which is incorporated herein by reference.
2. If the CONTRACTOR performs the Contract, the Surety and the CONTRACTOR have no obligation under this Bond, except to participate in conferences.
3. If there is no OWNER Default, the Surety's obligation under this Bond shall arise after:
 - 3.1. The OWNER has notified the CONTRACTOR and the Surety at the addresses described below, that the OWNER is considering declaring a CONTRACTOR Default and has requested and attempted to arrange a conference with the CONTRACTOR and the Surety to be held not later than fifteen days after receipt of such notice to discuss methods of performing the Contract. If the OWNER, the CONTRACTOR and the Surety agree, the CONTRACTOR shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive the OWNER's right, if any, subsequently to declare a CONTRACTOR Default; and
 - 3.2. The OWNER has declared a CONTRACTOR Default and formally terminated the CONTRACTOR's right to complete the Contract. Such CONTRACTOR Default shall not be declared earlier than twenty days after the CONTRACTOR and the Surety have received notice as provided; and
 - 3.3. The OWNER has agreed to pay the Balance of the Contract Price to:
 - 3.3.1. The Surety in accordance with the terms of the Contract;
 - 3.3.2. Another contractor selected to perform the Contract.
4. When the OWNER has satisfied the conditions, the Surety shall promptly and at the Surety's expense take one of the following actions:
 - 4.1. Arrange for the CONTRACTOR, with consent of the OWNER, to perform and complete the Contract; or
 - 4.2. Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or
 - 4.3. Obtain bids or negotiated proposals from qualified contractors acceptable to the OWNER for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by the OWNER and the contractor selected with the OWNER's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the Bonds issued on the Contract, and pay to the OWNER the amount of damages as described in excess of the Balance of the Contract Price incurred by the OWNER resulting from the CONTRACTOR Default; or
 - 4.4. Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances;
 - 4.4.1. After investigation, determine the amount for which it may be liable to the OWNER and, as soon as practicable after the amount is determined, tender payment therefor to the OWNER; or
 - 4.4.2. Deny liability in whole or in part and notify the OWNER citing reasons therefor.

5. If the Surety does not proceed as provided with reasonable promptness, the Surety shall be deemed to be in default on this Bond fifteen days after receipt of an additional written notice from the OWNER to the Surety demanding that the Surety perform its obligations under this Bond, and the OWNER shall be entitled to enforce any remedy available to the OWNER. If the Surety proceeds as provided and the OWNER refuses the payment tendered or the Surety has denied liability, in whole or in part, without further notice the OWNER shall be entitled to enforce any remedy available to the OWNER.

6. After the OWNER has terminated the CONTRACTOR's right to complete the Contract, and if the Surety elects to act under paragraph above, then the responsibilities of the Surety to the OWNER shall not be greater than those of the CONTRACTOR under the Contract, and the responsibilities of the OWNER to the Surety shall not be greater than those of the OWNER under the Contract. To a limit of the amount of this Bond, but subject to commitment by the OWNER of the Balance of the Contract Price to mitigation of costs and damages on the Contract, the Surety is obligated without duplication for:

6.1. The responsibilities of the CONTRACTOR for correction of defective Work and completion of the Contract;

6.2. Additional legal, design professional and delay costs resulting from the CONTRACTOR's Default, and resulting from the actions or failure to act of the Surety; and

6.3. Liquidated damages will be \$500.00 PER DAY caused by delayed performance or non-performance of the CONTRACTOR.

7. The Surety shall not be liable to the OWNER or others for obligations of the CONTRACTOR that are unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the OWNER or its heirs, executors, administrators, or successors.

8. The Surety hereby waives notice of any change, including changes of time, to the Contract or to related subcontracts, purchase orders and other obligations.

9. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located and shall be instituted within two years after CONTRACTOR Default or within two years after the CONTRACTOR ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

10. Notice to the Surety, the OWNER or the CONTRACTOR shall be mailed or delivered to the address shown on the signature page.

11. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted here from and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

12. Definitions.

12.1 Balance of the Contract Price: The total amount payable by the OWNER to the CONTRACTOR under the Contract after all proper adjustments have been made, including allowance to the CONTRACTOR of any amounts received or to be received by the OWNER in settlement of insurance or other Claims for damages to which the

CONTRACTOR is entitled, reduced by all valid and proper payments made to or on behalf of the CONTRACTOR under the Contract.

12.2. Contract: The agreement between the OWNER and the CONTRACTOR identified on the signature page, including all Contract Documents and changes thereto.

12.3. CONTRACTOR Default: Failure of the CONTRACTOR, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.

12.4. OWNER Default: Failure of the OWNER, which has neither been remedied nor waived, to pay the CONTRACTOR as required by the Contract or to perform and complete or comply with the other terms thereof.

ATTACHMENT G PAYMENT BOND

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

CONTRACTOR (Name and Address): **SURETY (Name and Address of Principal Place of Business):**

OWNER (Name and Address):

*City of Leon Valley
Office of the Purchasing Agent
6400 El Verde
Leon Valley, Texas 78238 (210) 684-1391*

CONTRACT

BID #2024-01 CDBG EAST OF WURZBACH SEWER MAIN

PROJECT

BID #2024-01 CDBG EAST OF WURZBACH SEWER MAIN

BOND

Bond Amount: 100%
Date (Not earlier than Contract Date): Amount:
Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Payment Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL (Corp. Seal) **SURETY** **(Corp Seal)**
Company: Company:

Signature: Signature:
Name and Title: Name and Title:
(Attach Power of Attorney)
(Space is provided below for signatures of additional parties, if required.)

CONTRACTOR AS PRINCIPAL (Corp. Seal) **SURETY** **(Corp Seal)**
Company: Company:

Signature: Signature:
Name and Title: Name and Title:
(Attach Power of Attorney)

1. The CONTRACTOR and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the OWNER to pay for labor, materials and equipment furnished for use in the performance of the Contract, which is incorporated herein by reference.

2. With respect to the OWNER, this obligation shall be null and void if the CONTRACTOR:
 - 2.1. Promptly makes payment, directly or indirectly, for all sums due Claimants, and
 - 2.2. Defends, indemnifies and holds harmless the OWNER from all claims, demands, liens or suits by any person or entity who furnished labor, materials or equipment for use in the performance of the Contract, provided the OWNER has promptly notified the CONTRACTOR and the Surety (at the addresses described) of any claims, demands, liens or suits and tendered defense of such claims, demands, liens or suits to the CONTRACTOR and the Surety, and provided there is no OWNER Default.
3. With respect to Claimants, this obligation shall be null and void if the CONTRACTOR promptly makes payment, directly or indirectly, for all sums due.
4. The Surety shall have no obligation to Claimants under this Bond until:
 - 4.1. Claimants who are employed by or have a direct contract with the CONTRACTOR have given notice to the Surety (at the addresses described) and sent a copy, or notice thereof, to the OWNER, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.
 - 4.2. Claimants who do not have a direct contract with the CONTRACTOR:
 - A. Have furnished written notice to the CONTRACTOR and sent a copy, or notice thereof, to the OWNER, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials were furnished or supplied or for whom the labor was done or performed; and
 - B. Have either received a rejection in whole or in part from the CONTRACTOR, or not received within 30 days of furnishing the above notice any communication from the CONTRACTOR by which the CONTRACTOR had indicated the claim will be paid directly or indirectly; and
 - C. Not having been paid within the above 30 days, have sent a written notice to the Surety and sent a copy, or notice thereof, to the OWNER, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to the CONTRACTOR.
 - D. If a notice required is given by the OWNER to the CONTRACTOR or to the Surety, that is sufficient compliance.
5. When the Claimant has satisfied the conditions, the Surety shall promptly and at the Surety's expense take the following actions:
 - 5.1. Send an answer to the Claimant, with a copy to the OWNER, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.
 - 5.2. Pay or arrange for payment of any undisputed amounts.
6. The Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.
7. Amounts owed by the OWNER to the CONTRACTOR under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any Performance Bond. By the CONTRACTOR furnishing and the OWNER accepting this Bond, they agree that all funds earned by the CONTRACTOR in the performance of the Contract are dedicated to satisfy

obligations of the CONTRACTOR and the Surety under this Bond, subject to the OWNER's priority to use the funds for the completion of the Work.

8. The Surety shall not be liable to the OWNER, Claimants or others for obligations of the CONTRACTOR that are unrelated to the Contract. The OWNER shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

9. The Surety hereby waives notice of any change, including changes of time, to the Contract or to related Subcontracts, purchase orders and other obligations.

10. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the Work or part of the Work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

11. Notice to the Surety, the OWNER or the CONTRACTOR shall be mailed or delivered to the addresses shown on the signature page. Actual receipt of notice by Surety, the OWNER or the CONTRACTOR, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

12. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted here from and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory Bond and not as a common law bond.

13. Upon request of any person or entity appearing to be a potential beneficiary of this Bond, the CONTRACTOR shall promptly furnish a copy of this Bond or shall permit a copy to be made.

14. DEFINITIONS

14.1. Claimant: An individual or entity having a direct contract with the CONTRACTOR or with a Subcontractor of the CONTRACTOR to furnish labor, materials or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of the CONTRACTOR and the CONTRACTOR's Subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

14.2. Contract: The agreement between the OWNER and the CONTRACTOR identified on the signature page, including all Contract Documents and changes thereto.

14.3. OWNER Default: Failure of the OWNER, which has neither been remedied nor waived, to pay the CONTRACTOR as required by the Contract or to perform and complete or comply with the other terms thereof.

ATTACHMENT H CONTRACTOR'S DISCLOSURE STATEMENT

All questions must be answered, or your bid will be deemed non-responsive and subject to rejection. The data given must be clear and comprehensive. This statement must be notarized. If necessary, questions may be answered on separate attached sheets. The bidder may submit any additional information he desires.

1. The Bidders Disclosure Statement is submitted to the City of Leon Valley, Texas by:

a Corporation a Partnership a Texas Joint Venture an Individual

Address: _____

City: _____ State: _____ Zip Code: _____

2. Years in business under present business name;

Years of experience in construction work of type called for in this contract is:

4.

A General Contractor

A Subcontractor

5. What projects has your organization completed? List most recent FIRST.

| Contract Amount | Type of Work | Date Completed | Owner's Name and Address | Contact Telephone No. |
|-----------------|--------------|----------------|--------------------------|-----------------------|
|-----------------|--------------|----------------|--------------------------|-----------------------|

5. What projects does your organization have underway as of this date?

| Contract Amount | Type of Work | % Completed | Owner's Name and Address |
|-----------------|--------------|-------------|--------------------------|
|-----------------|--------------|-------------|--------------------------|

6. Have you ever failed to complete any work awarded to you? Yes No.
If "Yes", state where and why.

7. Are you at present in any lawsuits involving construction work of any type?

Yes No

If "Yes", explain:

8. If this contract is awarded to you, your company's office administrative manager for the work will be Mr. (Ms.) _____, and your resident construction superintendent will be Mr. (Ms.) _____.

9. What experience in this type in this type of work does the individual designated above as resident superintendent have?

10. What portion of the work do you intend to subcontract?

11. What equipment do you own that is available for the proposed work? (Description, Quantity, Capacity, Size, Years in Service, Present Condition, Location)

12. Have you received firm offers from suppliers or manufacturers for all major items of material and/or equipment within the price totals used in preparing your proposal?

Yes

No

Credit Available: \$ _____ Bank Reference: _____

Bonding capacity available: \$ _____

The undersigned hereby authorizes and requests any person, firm or corporation to furnish any information requested by the Owner in verification of the recitals comprising this Bidders Disclosure Statement. The signatory of this questionnaire guarantees the truth and accuracy of all statements herein made and all answers herein expressed.

Date this _____ day of _____, 20 _____.

By: _____

Title: _____

STATE OF _____ COUNTY OF _____

Subscribed and sworn to before me this the _____ day of _____, 20 _____

Notary Public

My commission expires:

ATTACHMENT I TERMS & CONDITIONS

THE CONTRACTOR SHALL MAINTAIN THE FOLLOWING INSURANCE:

1. Workers' Compensation Insurance Coverage.

The insurance carrier shall be an admitted carrier in the State of Texas.

A. Definitions:

Certificate of coverage ("certificate") - A copy of a certificate of insurance, a certificate of authority to self-insure issued by the commission, or a coverage agreement (TWCC-81, TWCC-82, TWCC-83, or TWCC-84), showing statutory workers compensation insurance coverage for the person's or entity's employees providing services on a project, for the duration of the project.

Duration of the project - includes the time from the beginning of the work on the project until the contractor's/person's work on the project has been completed and accepted by the governmental entity.

Person's providing services on the project ("subcontractor" in section 406.096) - includes all persons or entities performing all or part of the services the contractor has undertaken to perform on the project, regardless of whether that person contracted directly with the contractor and regardless of whether that person has employees. This includes, without limitation, independent contractors, subcontractors, leasing companies, motor carriers, owner-operators, employees of any such entity, or employees of any entity which furnishes persons to provide services on the project.

"Services" include, without limitation, providing, hauling, or delivering equipment or materials, or providing labor, transportation, or other service related to a project. "Services" does not include activities unrelated to the project, such as food/beverage vendors, office supply deliveries, and delivery of portable toilets.

B. The contractor shall provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011 (44) for all employees of the contractor providing services on the project, for the duration of the project.

C. The contractor must provide a certificate of coverage to the governmental entity prior to being awarded the contract.

D. If the coverage period shown on the contractor's current certificate of coverage ends during the duration of the project, the contractor must, prior to the end of the coverage period, file a new certificate of coverage with the governmental entity showing that coverage has been extended.

E. The contractor shall obtain from each person providing services on a project, and provide to the governmental entity:

(1) a certificate of coverage, prior to that person beginning work on the project, so the governmental entity will have on file certificates of coverage for all persons providing services on the project; and

(2) no later than seven days after receipt by the contractor, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project.

F. The contractor shall retain all required certificates of coverage for the duration of the project and for one year thereafter.

G. The contractor shall notify the governmental entity in writing by certified mail or personal delivery, within 10 days after the contractor knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project.

H. The contractor shall post on each project site a notice, in the text, form and manner prescribed by the Texas Workers' Compensation Commission, informing all persons providing services on the project that they are required to be covered, and stating how a person may verify coverage and report lack of coverage.

I. The contractor shall contractually require each person with whom it contracts to provide services on a project, to:

(1) provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011 (44) for all of its employees providing services on the project, for the duration of the project;

(2) provide to the contractor, prior to that person beginning work on the project, a certificate of coverage showing that coverage is being provided services on the project for the duration of the project;

(3) provide the contractor, prior to the end of the coverage period, a new certificate of coverage showing extension of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(4) obtain from each other person with whom it contracts, and provide to the contractor:

(a) a certificate of coverage, prior to the other person beginning work on the project; and

(b) a new certificate of coverage showing extension of coverage, prior to the end of the coverage period, if the coverage period shown on the current coverage ends during the duration of the project;

(5) retain all required certificates of coverage on file for the duration of the project and for one year thereafter;

(6) notify the governmental entity in writing by certified mail or personal delivery, within 10 days after the person knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project; and

(7) contractually require each person with whom it contracts, to performs as required by paragraphs (1) - (7), with the certificates of coverage to be provided to the person for whom they are providing services.

J. By signing this contract or providing or causing to be a provided a certificate of coverage, the contractor is representing to the governmental entity that all employees of the contractor who will provide services on the project will be covered by workers' compensation coverage for the duration of the project, that the coverage will be based on proper reporting or classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or, in the case of a self-insured, with the commission's Division of Self-Insurance Regulation. Providing false or misleading information may subject the contractor to administrative penalties, criminal penalties, civil penalties, or civil actions.

K. The contractor's failure to comply with any of these provisions is a breach of contract by the contractor which entitles the governmental entity to declare the contract void if the contractor does not remedy the breach within ten days after receipt of the notice of breach from the governmental entity.

2. Comprehensive General Liability Insurance

This insurance shall:

A. Be in an amount not less than \$1,000,000 per occurrence, with a deductible of not more than \$2,500;

B. Include coverage for the liability assumed by the Contractor under Item F. (Indemnity);

C. Include completed operation coverage which is to be kept in force by the Contractor for a period of not less than one year after the completion of the work provided for or performed under these specifications;

D. Not be subject to any of the special property damage liability exclusions commonly referred to as the XCU exclusions pertaining to blasting or explosion, collapse, or structural damage and underground property;

E. Not be subject to any exclusion of property used by the insured or property in the case, custody or control of the insured or property as to which the insured for any purpose is exercising physical control;

F. In naming the City of Leon Valley as an additional insured on your comprehensive General Liability Insurance, the following words apply:

“Contractor shall defend, indemnify and hold harmless the City of Leon Valley, its agents and employees from and against any liability, loss, cost and expense (“Liability”) claimed by a third party (including reasonable attorney’s fees and cost of defense) resulting from Contractor’s performance of the Work to the extent that such Liability:

(1) is attributable to bodily injury, sickness, disease or death, or to the injury to or destruction of tangible personal property; and,

(2) is caused or contributed to by any neglect or fault of Contractor, its subcontractors, or their respective employees.

Where liability is attributable to the joint negligence or fault of Contractor and any other person (including Owner), Contractor’s duty of indemnification shall be limited to Contractor’s allocable share of such joint negligence or fault.”

G. The Insurance company must have as a minimum a current A.M. Best rating of A.

3. Comprehensive Automobile Liability in the following amounts:

| | |
|-----------------|--------------------------|
| Bodily Injury | \$1,000,000 per person |
| | \$3,000,000 per accident |
| Property Damage | \$300,000 per accident |

4. General Requirements for Insurance Coverage

A. The Certificate of Insurance furnished by the Contractor shall show by specific reference that each of the foregoing items have been provided for;

B. Certificates of Insurance required for each copy of the agreement which specifically set forth evidence of all required coverage will be filed with the City prior to the City’s execution of the contract. Worker’s Compensation Insurance coverage must be provided to the City prior to the City’s award of the contract.

C. The Certificates of Insurance furnished by the contractor as evidence of the Insurance maintained by the contractor will include a clause obligating the Insurer to give the City of Leon Valley ten (10) days prior written notice of cancellation or any material change in the insurance coverage.

D. Waiver of Subrogation: The City of Leon Valley and the Contractor waive all rights and the rights of their respective insurance companies against each other for damages caused by fire or other perils to the extent such damages are covered by property insurance purchased by either party.

5. Anti-Discrimination in Employment

A. The contractor (successful bidder) and/or any subcontractor(s), if permitted, certifies complete compliance with the Federal Civil Rights Law and the Americans with Disabilities Act, agreeing to non-discrimination based on race, age, color, religion, disability, gender, ancestry, national origin, or place of birth in employment practices, programs and services shall include but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination, rates of pay or other compensation; and selection for training, including apprenticeship.

B. The contractor shall in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, age, color, religion, disability, gender, ancestry, national origin, or place of birth.

C. Upon request by the City of Leon Valley, the contractor shall furnish all information or reports required to investigate his/her payrolls and personnel records which pertain to current contract(s) with the City for purposes of ascertaining compliance with this non-discrimination certification.

6. General Independent Contractor Clause

This agreement does not create an employer relationship between the parties. It is the parties' intention that the contractor will be an independent contractor and not the City of Leon Valley employee for all purposes, including, but not limited to, the application of the Fair Labor Standards Act minimum wage and overtime payments, Federal Insurance Contribution Act, the Social Security Act, the Federal Unemployment Tax Act, the provisions of the Internal Revenue Code, Texas workers' compensation law and Texas unemployment insurance law. The contractor will retain sole and absolute discretion in the judgment of the manner and means of carrying out the contractor's activities and responsibilities hereunder. The contractor agrees that it is a separate and independent enterprise from the City of Leon Valley, that it has a full opportunity to find other business, that it has made its own investment in its business, and that it will utilize a high level of skill necessary to perform the work. This agreement shall not be construed as creating any joint employment relationship between the contractor and the City of Leon Valley and the City of Leon Valley will not be liable for any obligation incurred by the contractor, including but not limited to unpaid minimum wages and/or overtime premiums.

7. Hot Goods Clause

The bidder hereby agrees that in the execution of the work he or she will comply with all applicable provisions of Sections 6, 7, and 12 of the Fair Labor Standards Act of 1938, as amended,

and that there will be no violations of the “hot goods” or “hot cargo” provisions of the Act involving restrictions on the use of underage employees.

8. Fire Safety

The contractor shall comply with all City regulations including those regarding Fire Safety. In this regard he shall comply with all instructions of the City Fire Marshall during the course of the work.

9. Hazard Communications Act

In compliance with Article 5182b, Texas Revised Civil Statutes, all employers are required to train and educate employees on the safe use and handling of hazardous materials that employees may be exposed to in the work place. The City of Leon Valley's Fire Chief is designated as the City's HazComm Officer. Contractors of the City are also required to comply with the requirements of this Act.

Contractors are entitled to a copy of the City's workplace chemical list to which the contractor, its employees and agents may be exposed to in the workplace. Contractors are also entitled to a copy of all MSDS sheets for any hazardous chemicals which the City may have in the work place. Contractors have the obligation to inform its employees and agents of all of these requirements. Contractor shall furnish the City with the MSDS sheets for any hazardous chemical brought into the City workplace that City employees will have exposure to. Contractors shall sign the Attachment 5, "Hazard Communications Contractor Acknowledgment" certifying receipt of this information.

10. FIRE SAFETY

The contractor shall comply with all City regulations including those regarding Fire Safety. In this regard, he shall comply with all instructions of the City Fire Marshall during the course of the work.

ATTACHMENT J HAZARD COMMUNICATIONS

CONTRACTOR ACKNOWLEDGMENT

IT IS HEREBY UNDERSTOOD AND AGREED THAT _____
_____, a Contractor under Contract dated the _____
day of _____, 20_____,

with the City of Leon Valley has received from the City notice of the Contractor's rights under the Texas Hazards Communications Act, the chemical list and material safety data sheets for hazardous chemicals that will be present in the City work area.

Contractor with the City of Leon Valley, understands our obligation to inform our employees and agents of the information provided. Material safety data sheets have been received for the following chemicals.

CONTRACTOR NAME: _____

NAME OF AUTHORIZED AGENT: _____

TITLE OF AUTHORIZED AGENT: _____

SIGNATURE OF AUTHORIZED AGENT: _____

DATE: _____

| CONFLICT OF INTEREST QUESTIONNAIRE For vendor doing business with local governmental entity | | FORM CIQ |
|--|------------------------|-----------------|
| <p>This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.</p> <p>This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a).</p> <p>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 vendor becomes aware of facts that require the statement to be filed. See Section 176.006(a-1), Local Government Code.</p> <p>A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.</p> | OFFICE USE ONLY | |
| <p>1 Name of vendor who has a business relationship with local governmental entity.</p> | Date Received | |
| <p>2 <input type="checkbox"/> 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 on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)</p> | | |
| <p>3 Name of local government officer about whom the information is being disclosed.</p> <p style="text-align: center;">_____</p> <p style="text-align: center;">Name of Officer</p> | | |
| <p>4 Describe each employment or other business relationship with the local government officer, or a family member of the officer, as described by Section 176.003(a)(2)(A). Also describe any family relationship with the local government officer. Complete subparts A and B for each employment or business relationship described. Attach additional pages to this Form CIQ as necessary.</p> <p style="margin-left: 40px;">A. Is the local government officer or a family member of the officer receiving or likely to receive taxable income, other than investment income, from the vendor?</p> <p style="margin-left: 80px;"> <input type="checkbox"/> Yes <input type="checkbox"/> No </p> <p style="margin-left: 40px;">B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer or a family member of the officer AND the taxable income is not received from the local governmental entity?</p> <p style="margin-left: 80px;"> <input type="checkbox"/> Yes <input type="checkbox"/> No </p> | | |
| <p>5 Describe each employment or business relationship that the vendor named in Section 1 maintains with a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership interest of one percent or more.</p> | | |
| <p>6 <input type="checkbox"/> Check this box if the vendor has given the local government officer or a family member of the officer one or more gifts as described in Section 176.003(a)(2)(B), excluding gifts described in Section 176.003(a-1).</p> | | |
| <p>7</p> <p style="text-align: center;"> _____ Signature of vendor doing business with the governmental entity </p> <p style="text-align: right; margin-right: 100px;"> _____ Date </p> | | |

CONFLICT OF INTEREST QUESTIONNAIRE
For vendor doing business with local governmental entity

A complete copy of Chapter 176 of the Local Government Code may be found at <http://www.statutes.legis.state.tx.us/Docs/LG/htm/LG.176.htm>. For easy reference, below are some of the sections cited on this form.

Local Government Code § 176.001(1-a): "Business relationship" means a connection between two or more parties based on commercial activity of one of the parties. The term does not include a connection based on:

- (A) a transaction that is subject to rate or fee regulation by a federal, state, or local governmental entity or an agency of a federal, state, or local governmental entity;
- (B) a transaction conducted at a price and subject to terms available to the public; or
- (C) a purchase or lease of goods or services from a person that is chartered by a state or federal agency and that is subject to regular examination by, and reporting to, that agency.

Local Government Code § 176.003(a)(2)(A) and (B):

(a) A local government officer shall file a conflicts disclosure statement with respect to a vendor if:

(2) the vendor:

(A) has an employment or other business relationship with the local government officer or a family member of the officer that results in the officer or family member receiving taxable income, other than investment income, that exceeds \$2,500 during the 12-month period preceding the date that the officer becomes aware that

- (i) a contract between the local governmental entity and vendor has been executed;
- or
- (ii) the local governmental entity is considering entering into a contract with the vendor;

(B) has given to the local government officer or a family member of the officer one or more gifts that have an aggregate value of more than \$100 in the 12-month period preceding the date the officer becomes aware that:

- (i) a contract between the local governmental entity and vendor has been executed; or
- (ii) the local governmental entity is considering entering into a contract with the vendor.

Local Government Code § 176.006(a) and (a-1)

(a) A vendor shall file a completed conflict of interest questionnaire if the vendor has a business relationship with a local governmental entity and:

- (1) has an employment or other business relationship with a local government officer of that local governmental entity, or a family member of the officer, described by Section 176.003(a)(2)(A);
- (2) has given a local government officer of that local governmental entity, or a family member of the officer, one or more gifts with the aggregate value specified by Section 176.003(a)(2)(B), excluding any gift described by Section 176.003(a-1); or
- (3) has a family relationship with a local government officer of that local governmental entity.

(a-1) The completed conflict of interest questionnaire must be filed with the appropriate records administrator not later than the seventh business day after the later of:

(1) the date that the vendor:

- (A) begins discussions or negotiations to enter into a contract with the local governmental entity; or
- (B) submits to the local governmental entity an application, response to a request for proposals or bids, correspondence, or another writing related to a potential contract with the local governmental entity; or

(2) the date the vendor becomes aware:

- (A) of an employment or other business relationship with a local government officer, or a family member of the officer, described by Subsection (a);
- (B) that the vendor has given one or more gifts described by Subsection (a); or
- (C) of a family relationship with a local government officer.

ATTACHMENT L FORM 1295 - TEXAS ETHICS COMMISSION

This document is available on-line at the following link:

<https://www.ethics.state.tx.us/forms/1295.pdf>

NOTE: The successful vendor, upon award of contract by City Council, shall file Form 1295 with the Texas Ethics Commission and supply a completed copy to the Purchasing Agent within one week. This form must be filed on-line at <https://www.ethics.state.tx.us/forms/1295.pdf>.

TECHNICAL SPECIFICATIONS

SECTION TS – CDBG EAST OF WURZBACH SEWER MAIN

San Antonio Water System Standard Specifications for Construction

ITEM NO. 100

Mobilization

100.1 DESCRIPTION: This item shall govern the mobilization of personnel, equipment, and supplies at the project site in preparation for beginning work on other contract items that will be performed by the Contractor. Mobilization shall include, but is not limited to, the movement of equipment, personnel, material, supplies, etc. to the project site, application fees, permit fees for all necessary permits and the establishment of the Contractor's office and other facilities prior to beginning the work. The cost of required insurance and bonds shall be include in this item.

100.2 MEASUREMENT: Measurement of the Item No. 100, Mobilization, as specified herein, will be by the "Lump Sum," (LS) as the work progresses

100.3 PAYMENTS: Payment shall be compensation for all work including the furnishing of all materials, equipment, tools, labor, and incidentals necessary to complete the work. Payment earned for this line item will be withheld, until said documents are submitted and approved by SAWS: all material submittals, Specification Item No. 902 Safety and Health Program, Specification Item No. 903 Construction QC/QA Program, Specification Item No. 1114 Pre-Construction Videos, and Specification Item No. 1110 Progress Schedule. Partial payments of the "Lump Sum" bid for mobilization will be 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 and Preparing Right-Of-Way).

1. When 1% of the adjusted contract amount for construction items is earned, 50% of the "Lump Sum" bid or 5% of the total contract amount, whichever is less, will be paid.
2. When 5% of the adjusted contract amount for construction items is earned, 75% of the "remainder of the Lump Sum" bid or 10% of the total contract amount, whichever is less, will be deducted from the above amount.
3. When 10% of the adjusted contract amount for construction items is earned, 90% of the "remainder of the Lump Sum" bid or 15% of the total contract amount, whichever is less, will be paid. Previous payments under this item will be deducted from the above amount.

San Antonio Water System Standard Specifications for Construction

4. Upon completion of all work under this contract, payment for the remainder of the “Lump Sum” bid for Mobilization will be made on the final pay estimate.
5. SAWS General Conditions (GCs) ARTICLE 7.2 states payments shall be made by the Inspector for approved materials stored on the project site that are deemed necessary and required for the “PROJECT WORK”. Materials considered as “on-site” material must be stored on the project site and/or within off-site facilities either owned or leased (signed by both parties) by the Contractor. Materials On-Site are limited to the items listed in Table 1.

| Table 1 | |
|--|---|
| “Materials On-Site” Payment Guidelines | |
| <u>“Materials On-Site” Application</u> | |
| <i>Water, Recycle, Re-Use or Wastewater Pressure Main</i> | |
| Pipe | 4-inch diameter or greater (rounded down to the nearest whole foot) |
| Valves | 4-inch diameter or greater (only when bid as a separate line item) |
| Fire Hydrants | Includes all items for complete assembly |
| <i>Wastewater Gravity Main Facilities</i> | |
| Pipe | 6-inch. diameter or greater (rounded down to the nearest whole foot) |
| Manholes | Includes base and cone section, risers, rings and covers. Excludes risers for FRP unless proper stations are provided noting location. |
| Wet wells | Excludes covers |

San Antonio Water System Standard Specifications for Construction

| <u>“Materials On-Site” Limitations</u> | |
|--|---|
| SAWS will <i>not</i> pay “Materials On-Site” for: | Quantities that exceed plan quantities |
| | Items that are not specifically listed as individual lines items (example: 6-in. valves that are included in the unit price of a fire hydrant assembly) |
| | Fittings, flanges, small diameter pipe or valves, cleanouts, meter boxes or incidentals. |
| | Materials stored at a supplier’s yard or facility. |
| | Materials that are stored at an excessive distance from the project site (based solely on the judgment of the SAWS Inspector) |
| | Any other items not specifically included in the “application” section of <i>Table 1: “Materials On-Site” Payment Guidelines</i> |

End of Specifications

San Antonio Water System Standard Specifications for Construction

ITEM NO. 101

Preparing Right- Of-Way

101.1 DESCRIPTION: This item shall govern preparing the right-of-way for construction operations by removing and disposing of all obstructions from the right-of-way and from designated easements where removal of such obstructions is not otherwise provided for in the contract documents.

1. It is the intent of this specification to provide for the removal and disposal of all obstructions and/or materials, not specifically provided for elsewhere by the contract documents.
2. This item shall also include the removal of trees, stumps, bushes, shrubs, brush, roots, vegetation, logs, rubbish, paved parking areas, miscellaneous stone, brick, drainage structures, manholes, inlets, abandoned railroad tracks, scrap iron and all debris, whether above or below ground, except live utility facilities.
3. This item shall not govern the demolition of buildings by the use of explosives. Such demolition work shall be governed by the use of a special specification controlling the work.

101.2 CONSTRUCTION METHODS: Areas designated in the contract documents shall be cleared of all obstructions, vegetation, abandoned structures, etc., as listed within this specification Item No. 101 Preparing Right-Of-Way and as shown on the plans, except trees or shrubs specifically designated by the Engineer for preservation.

1. Such obstructions shall be considered to include, but not be limited to, remains of houses or structures not completely removed by Contractor or others, foundations, floor slabs, concrete, brick, lumber, plaster, cisterns, septic tanks, basements, abandoned utility pipes or conduits, equipment or other foundations, fences, retaining walls, outhouses, shacks, and all other debris, as well as buried concrete slabs, curbs, driveways and sidewalks.
2. All fences along the right-of- way which are damaged or removed temporarily by the Contractor shall be replaced by the Contractor to an equal or better condition, at no expense to SAWS.
3. Contractor shall adhere to the current City of San Antonio Tree Ordinance
4. Trees and shrubs designated by the tree ordinance for preservation shall be carefully trimmed as noted in the contract documents and shall be protected from

San Antonio Water System Standard Specifications for Construction

- scarring, barking, or other injuries during construction operations. Exposed ends of pruned limbs shall be treated with an approved pruning material.
5. Unless otherwise indicated in the contract documents, all underground obstructions shall be removed to the following depths:
 - a. In areas to receive embankment, 2 ft below natural finished grade.
 - b. In areas to be excavated, 2 ft below the lowest elevation of the excavation;
 - c. All other areas, 2 ft below finished grade.
 6. Holes remaining after removal of all obstructions, objectionable materials, vegetation, etc., shall be backfilled and tamped as directed by the SAWS Inspector, and the entire area shall be bladed to prevent ponding of water and to provide drainage. In areas that are to be immediately excavated, backfilling and blading may be eliminated, if approved by the SAWS Inspector.
 7. Areas to be used as borrow sites and material sources shall have all obstruction, objectionable materials, vegetation, etc., removed to the complete extent necessary to prevent such objectionable matter from becoming mixed with the material to be used in the construction.
 8. Where a conduit is shown to be replaced, it shall be removed in its entirety, and all connections to the existing conduit or pipe shall be made. Where an existing conduit or pipe is to be cut and plugged, the line shall be cut back not less than 2 ft, and a plug of concrete not less than 2 ft long shall be poured and held in the end of the conduit or pipe. The plug may also be accomplished by using a precast stopper grouted into place.
 9. Material to be removed will be designated as “salvageable” or “non-salvageable” in the contract documents prior to bidding by the Contractor. All “salvageable” material will remain the property of the SAWS and will be stored at the site as directed by the SAWS Inspector. All “non-salvageable” materials and debris removed shall become the property of the Contractor and shall be removed from the site and shall be disposed of properly.
 10. All asphaltic material shall be disposed of or recycled at the facility authorized to accept the asphalt for such purposes and applicable to appropriate guidelines and regulations.

101.3 MEASUREMENT: Measurement of the Item No. 101, Preparing Right of Way, as specified herein, will be by the “Lump Sum,” as the work progresses.

San Antonio Water System Standard Specifications for Construction

101.4 PAYMENTS: Payment shall be compensation for all work including the furnishing of all materials, equipment, tools, labor, tree pruning, removal, protection, landscape impacts, and incidentals necessary to complete the work. Payment earned for this line item will be withheld, until said documents are submitted and approved by SAWS: all material submittals, Item No. 902 Safety and Health Program, Item No. 903 Construction QC/QA Program, Item No. 1114 Pre-Construction and Post Construction Videos, and Item No. 1110 Progress Schedule. Partial payments of the “Lump Sum” bid for preparing right-of-way will be 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 and Preparing Right-Of-Way).

1. When 1% of the adjusted contract amount for construction items is earned, 50% of the “Lump Sum” bid or 5% of the total contract amount, whichever is less, will be paid.
2. When 5% of the adjusted contract amount for construction items is earned, 75% of the “remainder of the Lump Sum” bid or 10% of the total contract amount, whichever is less, will be deducted from the above amount.
3. When 10% of the adjusted contract amount for construction items is earned, 90% of the “remainder of the Lump Sum” bid or 15% of the total contract amount, whichever is less, will be paid. Previous payments under this item will be deducted from the above amount.
4. Upon completion of all work under this contract, payment for the remainder of the “Lump Sum” bid for Preparing Right-Of-Way will be made on the final pay estimate.

- End of Specification -

ITEM

205 HOT MIX ASPHALTIC CONCRETE PAVEMENT

205.1. DESCRIPTION: *Construct a leveling-up course, a surface course or any combination of these courses as shown on the plans, each to be composed of a compacted mixture of mineral aggregate and asphaltic material. The pavement shall be constructed on the newly constructed subgrade or base course, existing pavement, bituminous surface or in the case of bridges, on the prepared floor slab, as herein specified and in accordance with the details shown on the plans.*

205.2. MATERIALS: Materials used in Hot Mix Asphaltic Concrete Pavement shall meet the requirements as set forth herein. If shown on the plans, materials may also meet the requirements as described in Item 340, "Dense-Graded Hot-Mix Asphalt (Method)" or Item 341, "Dense-Graded Hot-Mix Asphalt (QC/QA)" of the Texas Department of Transportation Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges.

Unless otherwise shown on the plans, provide aggregates that meet the aggregate quality requirements of TxDOT's Bituminous Rated Source Quality Catalog (BRSQC). Unapproved sources may be used if accepted by the Engineer and approved prior to use.

Furnish aggregates from sources that conform to the requirements shown in Table 1 herein, and as specified in this Section, unless otherwise shown on the plans. Provide aggregate stockpiles that meet the definition in this Section for either a coarse aggregate or fine aggregate. When reclaimed asphalt pavement (RAP) is used, provide RAP stockpiles in accordance with this Section. Aggregate from RAP is not required to meet Table 1 requirements unless otherwise shown on the plans.

Document all test results on a mixture design report and submit to the Engineer for approval. The Engineer may perform tests on independent or split samples to verify Contractor mix design results. Stockpile aggregates for each source and type separately. Determine aggregate gradations for mixture design and production testing based on the washed sieve analysis given in TxDOT standard laboratory test procedure Tex-200-F, Part II. Do not add material to an approved stockpile from other sources, unless otherwise approved by the Engineer.

Unless otherwise shown on the plans, reclaimed asphalt pavement (RAP) may be used in asphalt pavement maintenance or rehabilitation applications and shall be limited to a maximum of 20% RAP for surface or wearing courses and 30% RAP for courses below the surface or wearing course. Higher percentages of RAP may be used if requested in writing and approved by the Engineer prior to use.

A. Coarse Aggregate. Coarse aggregate stockpiles must have no more than 20% passing the #8 sieve. Provide aggregates with a surface aggregate classification (SAC) as shown below:

| <u>Street Classification</u> | <u>Minimum Surface Aggregate Classification</u> |
|---|---|
| Primary and Secondary Arterials | A |
| Collector and Local Type B Streets | B |
| Local Type A Street With Bus Traffic | B |
| Local Type A Street Without Bus Traffic | C |

SAC requirements apply only to aggregates used on the surface of travel lanes, unless otherwise shown on the plans. Blending aggregates to meet SAC criteria is allowable. Class B aggregate meeting all other requirements in Table 1 may be blended with a Class A aggregate in order to meet requirements for Class A materials. When blending Class A and B aggregates to meet a Class A requirement, ensure that at least 50% by weight of the material retained on the No. 4 sieve comes from the Class A aggregate source. Blend by volume if the bulk specific gravities of the Class A and B aggregates differ by more than 0.300. When blending, do not use Class C or D aggregates. For blending purposes, coarse aggregate from RAP will be considered as Class B aggregate.

- B. Reclaimed Asphalt Pavement (RAP).** RAP is defined as a salvaged, pulverized, broken or crushed asphalt pavement. The RAP to be used in the mix shall be crushed or broken to the extent that 100% will pass the two inch sieve.

The stockpiled RAP shall not be contaminated by dirt or other objectionable materials. Unless otherwise shown on the plans, stockpiled, crushed RAP shall have a decantation of 5% or less and a plasticity index of eight (8) or less, when tested in accordance with TxDOT standard laboratory test procedures Tex-406-A, Part I, and Tex-106-E, respectively. This requirement applies to stockpiles from which the asphalt has not been removed by extraction. When RAP is used, determine asphalt content and gradation for mixture design purposes.

- C. Fine Aggregate.** Fine aggregates may consist of manufactured sands, screenings and field sands. Supply fine aggregates that are free from organic impurities. Field sands and other uncrushed aggregates shall be limited to 15% of the total aggregate.

If 10% or more of the fine aggregate stockpile is retained on the No. 4 sieve, test the stockpile and verify that it meets the requirements in Table 1 for coarse aggregate angularity (TxDOT standard laboratory test procedure Tex-460-A) and flat and elongated particles (TxDOT standard laboratory test procedure Tex-280-F).

- D. Asphalt Binder.** Unless shown on the plans, provide the type and grade of performance-graded asphalt binder in accordance with TxDOT Item 300.2.J. “Performance-Graded Binders” and as specified below:

| Street Classification | Minimum PG Asphalt Cement Grade | | |
|---|---------------------------------|---------------------------|--------------|
| | Surface Courses | Binder & Level Up Courses | Base Courses |
| Primary and Secondary Arterials | PG 76-22 | PG 70-22 | PG 64-22 |
| Collector and Local Type B Streets | PG 70-22 | | |
| Local Type A Street With Bus Traffic | | PG 64-22 | |
| Local Type A Street Without Bus Traffic | PG 64-22 | | |

- E. Mineral Filler.** Mineral filler consists of finely divided mineral matter such as agricultural lime, crusher fines, hydrated lime, cement, or fly ash. Mineral filler is allowed unless otherwise shown on the plans. Do not use more than 2% hydrated lime or cement, unless otherwise shown on the plans. The plans may require or disallow specific mineral fillers. When used, provide mineral filler that:

- is sufficiently dry, free-flowing, and free from clumps and foreign matter;

- does not exceed 3% linear shrinkage when tested in accordance with Tex-107-E; and
 - meets the gradation requirements of Table 3 herein.
- F. Baghouse Fines.** Fines collected by the baghouse or other dust collecting equipment may be reintroduced into the mixing drum.
- G. Tack Coat.** Unless otherwise shown on the plans or approved, furnish CSS-1H, SS-1H, or a PG binder with a minimum high-temperature grade of PG 58 for tack coat binder and in accordance with Item 203, "Tack Coat." Do not dilute emulsified asphalts at the terminal, in the field, or at any other location before use.
- H. Additives.** When shown on the plans, use the type and rate of additive specified. Other additives that facilitate mixing or improve the quality of the mixture may be allowed when approved. If lime or a liquid antistripping agent is used, add in accordance with TxDOT Item 301, "Asphalt Antistripping Agents." Do not add lime directly into the mixing drum of any plant where lime is removed through the exhaust stream, unless the plant has a baghouse or dust collection system that reintroduces the lime back into the drum.

Table 1
Aggregate Quality Requirements

| Property | TxDOT Standard Laboratory Test Procedure | Surface Courses | Binder, Level Up, & Base Courses |
|--|---|--------------------|--|
| Coarse Aggregate | | | |
| Deleterious Material, %, max | Tex-217-F, Part I | 1.0 | 1.5 |
| Decantation, %, max | Tex-217-F, Part II | 1.5 | 1.5 |
| Micro-Deval Abrasion, %, max | Tex-461-A | Screening Only | Screening Only |
| Los Angeles Abrasion, %, max | Tex-410-A | 35 | 40 |
| Magnesium Sulfate Soundness, 5 cycles, %, max | Tex-411-A | 25 | 30 |
| Coarse Aggregate Angularity, 2 crushed faces, %, min | Tex-460-A, Part I | 95 ¹ | 85 ¹ |
| Flat and Elongated Particles @ 5:1, %, max | Tex-280-F | 10 | 10 |
| Fine Aggregate | | | |
| Linear Shrinkage, %, max | Tex-107-E | 3 | 3 |
| Combined Aggregate² | | | |
| Sand Equivalent, %, min | Tex-203-F | 45 | 45 |

Note 1: Applies to Gravel Only

Note 2: Aggregate without mineral filler, RAP, or additives combined as used in the job-mixed formula (JMF)

Table 2
Gradation Requirements for Fine Aggregates

| Sieve Size, in | % Passing by Weight or Volume |
|----------------|-------------------------------|
| 3/8 | 100 |
| #8 | 70 – 100 |
| #200 | 0 – 30 |

Table 3
Gradation Requirements for Mineral Filler

| Sieve Size, in | % Passing by Weight or Volume |
|----------------|-------------------------------|
| #8 | 100 |
| #200 | 55 – 100 |

205.3. EQUIPMENT: All equipment for the handling of all materials, mixing, placing and compacting of the mixture shall be maintained in good repair and operating condition and subject to the approval of the Engineer. Any equipment found to be defective and potentially having a negative effect on the quality of the paving mixture or ride quality will not be allowed.

A. Spreading and Finishing Machine. The spreading and finishing machine shall be approved by the Engineer and shall meet the requirements indicated below.

- 1. Screed Unit.** The spreading and finishing machine shall be equipped with a heated compacting screed. It shall produce a finished surface meeting the requirements of the typical cross sections and the surface test.

Extensions added to the screed shall be provided with the same compacting action and heating capability as the main screed unit, except for use on variable depth tapered areas and/or as approved by the Engineer.

The spreading and finishing machine shall be equipped with an approved automatic dual longitudinal screed control system and automatic transverse screed control system. The longitudinal controls shall be capable of operating from any longitudinal grade reference including a stringline, ski, mobile stringline, or matching shoe.

The Contractor shall furnish all equipment required for grade reference. It shall be maintained in good operating condition by personnel trained in the use of this type of equipment.

The grade reference used by the Contractor may be of any type approved by the Engineer. The contractor shall set the grade reference to have sufficient support so that the maximum deflection shall not exceed 1/16 inch between supports.

- 2. Tractor Unit.** The tractor unit shall be equipped with a hydraulic hitch sufficient in design and capacity to maintain contact between the rear wheels of the hauling equipment and the pusher rollers of the finishing machine while the mixture is being unloaded.

No portion of the weight of hauling equipment, other than the connection, shall be supported by the asphalt paver. No vibrations or other motions of the loading equipment, which could have a detrimental effect on the riding quality of the completed pavement, shall be transmitted to the paver.

The use of any vehicle which requires dumping directly into the finishing machine and which the finishing machine cannot push or propel to obtain the desired lines and grades without resorting to hand finishing will not be allowed.

B. Material Transfer Equipment. Equipment to transfer mixture from the hauling units or the roadbed to the spreading and finishing machine will be allowed unless otherwise shown on the plans. A specific type of material transfer equipment shall be required when shown on the plans.

C. Motor Grader. The motor grader, when used, shall meet the requirements as shown in Item 220, "Blading."

D. Rollers. Rollers provided shall meet the requirements for their type as shown in Item 210, "Rolling."

205.4. CONSTRUCTION: It shall be the responsibility of the Contractor to design, produce, transport, place and compact the specified paving mixture in accordance with the requirements herein. The Engineer will perform verification testing as needed. Provide quality control (QC) testing as needed to meet the requirements of this Item. Provide a certified Level I-A specialist at the plant during production hours. Provide a certified Level I-B specialist to conduct placement tests.

A. Quality Control Plan (QCP). Unless otherwise shown on the plans, develop and follow a QCP. Obtain approval from the Engineer for changes to the QCP made during the project. The Engineer may suspend operations if the Contractor fails to comply with the QCP.

Submit a written QCP to the Engineer and receive the Engineer's approval of the QCP before beginning production. Include the following items in the QCP.

1. Project Personnel. Provide:

- a. a list of individuals that will conduct tests as well their associated certifications (i.e. Level IA, IB, and II certifications), including when certifications will expire for each individual; and
- b. a list of individuals responsible for QC with authority to take corrective action and the contact information for each individual listed.

2. Material Delivery and Storage. Provide:

- a. the sequence of material processing, delivery, and minimum quantities to assure continuous plant operations;
- b. aggregate stockpiling procedures to avoid contamination and segregation;
- c. frequency, type, and timing of aggregate stockpile testing to assure conformance of material requirements before mixture production; and
- d. procedure for monitoring the quality and variability of asphalt binder.

3. Production. Detail:

- a. loader operation procedures to avoid contamination in cold bins;
- b. procedures for calibrating and controlling cold feeds;
- c. procedures to eliminate debris or oversized material;
- d. procedures for adding and verifying rates of each applicable mixture component (e.g., aggregate, asphalt binder, RAP, lime, liquid antistriper);
- e. procedures for reporting job control and acceptance test results; and
- f. procedures to avoid segregation and drain-down in the silo.

4. Loading and Transporting. Provide:

- a. the type and application method for release agents; and

- b. truck loading procedures to avoid segregation.

5. Placement and Compaction. Provide:

- a. the proposed agenda for mandatory pre-paving meeting including date and location;
- b. the type and application method for release agents in the paver and on rollers, shovels, lutes, and other utensils;
- c. procedures for the transfer of mixture into the paver while avoiding segregation and preventing material spillage;
- d. the process to balance production, delivery, paving, and compaction to achieve continuous placement operations;
- e. the paver operations (e.g., operation of wings, height of mixture in auger chamber) to avoid physical and thermal segregation and other surface irregularities; and
- f. procedures to construct quality longitudinal and transverse joints.

- B. Mixture Design.** Use a Level II specialist certified by a TxDOT-approved hot-mix asphalt certification program to develop the mixture design. Have the Level II specialist sign the design documents. Unless otherwise shown on the plans, use the typical weight design example given in TxDOT standard laboratory test procedure Tex-204-F, Part I or Part III, to design a mixture meeting the requirements listed in Tables 1 through 5. At the request of the Engineer, furnish representative samples of all materials used in the mixture design for verification. If the design cannot be verified by the Engineer, furnish another mixture design.

The Contractor may submit a new mixture design at anytime during the project. The Engineer will approve all mixture designs before the Contractor can begin production.

Provide the Engineer with a mixture design report that includes the following items:

- the combined aggregate gradation, source, specific gravity, and percent of each material used;
- results of all applicable tests;
- the mixing and molding temperatures;
- all applicable correlation and correction factors;
- the signature of the Level II person or persons who performed the design;
- the date the mixture design was performed; and
- a unique identification number for the mixture design.

The Hamburg Wheel Test is not required, unless otherwise shown on the plans. When required through plan note, the minimum number of passes shown in Table 6 shall be met, unless otherwise approved by the Engineer. The contractor will be responsible for submitting the results of the Hamburg Wheel test to the Engineer with the other mixture design data. Use an approved laboratory to perform the Hamburg Wheel test. The TxDOT Construction

Division maintains a list of approved laboratories that may be referenced. Hamburg Wheel Testing will not be performed or required for any Type “F” mixtures.

Table 4
Master Gradation Bands (% Passing by Weight or Volume) and Volumetric Properties

| Sieve Size | A Coarse Base | B Fine Base | C Coarse Surface | D Fine Surface | F Fine Mixture |
|---|---------------------|-------------------|------------------------|----------------------|----------------------|
| 1-1/2" | 98.0–100.0 | – | – | – | – |
| 1" | 78.0–94.0 | 98.0–100.0 | – | – | – |
| 3/4" | 64.0–85.0 | 84.0–98.0 | 95.0–100.0 | – | – |
| 1/2" | 50.0–70.0 | – | – | 98.0–100.0 | – |
| 3/8" | – | 60.0–80.0 | 70.0–85.0 | 85.0–100.0 | 98.0–100.0 |
| #4 | 30.0–50.0 | 40.0–60.0 | 43.0–63.0 | 50.0–70.0 | 70.0–90.0 |
| #8 | 22.0–36.0 | 29.0–43.0 | 32.0–44.0 | 35.0–46.0 | 35.0–50.0 |
| #30 | 8.0–23.0 | 13.0–28.0 | 14.0–28.0 | 15.0–29.0 | 12.0–27.0 |
| #50 | 3.0–19.0 | 6.0–20.0 | 7.0–21.0 | 7.0–20.0 | 6.0–19.0 |
| #200 | 2.0–7.0 | 2.0–7.0 | 2.0–7.0 | 2.0–7.0 | 2.0–7.0 |
| Design Voids in the Mineral Aggregate (VMA), % minimum | | | | | |
| | 12.0 | 13.0 | 14.0 | 15.0 | 16.0 |
| Plant-Produced Voids in the Mineral Aggregate (VMA), % minimum | | | | | |
| | 11.0 | 12.0 | 13.0 | 14.0 | 15.0 |

Table 5
Laboratory Mixture Design Properties

| Property | TxDOT Standard Laboratory Test Procedure | Required | |
|-------------------------------------|--|-----------------------------------|--|
| Target laboratory-molded density, % | Tex-207-F | 96.5 | Base, Binder, and Level Up Courses |
| | | Surface or Wearing Courses | |
| | | 96.5 | Primary and Secondary Arterials |
| | | 97.0 | Collectors, Local Type B Streets, and Local Type A Street With Bus Traffic |
| | | 97.5 | Local Type A Street Without Bus Traffic |
| Boil test ¹ | Tex-530-C | – | |

1. Used to establish baseline for comparison to production results. May be waived when approved.

Table 6
Hamburg Wheel Test Requirements¹

| High-Temperature Binder Grade | Minimum # of Passes ² @ 0.5" Rut Depth, Tested @ 122°F |
|----------------------------------|--|
| PG 64 or lower | 5,000 |
| PG 70 | 10,000 |
| PG 76 or higher | 20,000 |

1. Tested in accordance with Tex-242-F.

2. May be decreased if shown on the plans.

C. Job-Mix Formula. The laboratory mixture design shall be submitted to the Engineer for approval prior to production and placement. The submittal shall provide the laboratory

designed mixture target properties and data that demonstrate the contractor's ability to produce the mixture within the tolerances specified in Table 7 herein either through a trial batch or by submittal of previous production data from a City or TxDOT project.

Once approved, the contractor may begin production and placement of the approved JMF. Results from Lot 1 of the JMF may be used to modify the optimum mixture properties as long as the tested properties are within the tolerances specified in Table 7 herein. Further adjustments to the JMF may be allowed by the Engineer during production and placement, if warranted. JMF adjustment requests must be made in writing to the Engineer and the mixture must conform to the master gradation limits for the mixture type and be within the operational limits of Table 7 noted above for the initial JMF approved by the Engineer.

Table 7
Operational Tolerances

| Description | Test Method | Allowable Difference from Current JMF Target |
|---|---------------------------|--|
| Individual % Retained for #8 Sieve or Larger | Tex-200-F or Tex-236-F | ±5.0 ¹ |
| Individual % Retained for Sieves Smaller than #8 and Larger than #200 | | ±3.0 ¹ |
| % Passing the #200 Sieve | | ±2.0 ¹ |
| Asphalt Content, % | Tex-236-F | ±0.3 ² |
| Laboratory-Molded Density, % | Tex-207-F | ±1.0 |
| VMA, % minimum | | Note 3 |

Note 1: When within these tolerances, mixture production gradations may fall outside the master grading limits; however, the % passing the #200 sieve will be considered out of tolerance when outside the master grading limits.

Note 2: Tolerance between Laboratory Mix and Plant Trial Batch may exceed ±0.3.

Note 3: Test and verify that Table 4 requirements are met.

- D. Production.** Do not heat the asphalt binder above the temperatures specified in TxDOT Item 300, "Asphalts, Oils, and Emulsions," or outside the manufacturer's recommended values. Do not store an asphaltic mixture for a period long enough to affect the quality of the mixture, nor in any case longer than 12 hr.

Notify the Engineer of the target discharge temperature and produce the mixture within 25°F of the target. Monitor the temperature of the material in the truck before shipping to ensure that it does not exceed 350°F. The Engineer will not pay for, or allow placement of, any mixture produced at more than 350°F. Control the mixing time and temperature so that moisture is removed from the mixture before discharging from the plant. If requested, determine the moisture content by oven-drying in accordance with TxDOT standard laboratory test procedure Tex-212-F, Part II, and verify that the mixture contains no more than 0.2% of moisture by weight. Obtain the sample immediately after discharging the mixture into the truck, and perform the test promptly.

Perform a new trial batch when the plant or plant location is changed. The Engineer may suspend production for noncompliance with this Item. Take corrective action and obtain approval to proceed after any production suspension for noncompliance.

- E. Tack Coat.** The surface upon which the tack coat is to be placed shall be cleaned thoroughly to the satisfaction of the Inspector. The surface shall be given a uniform application of tack coat using asphaltic materials of this specification. Unless otherwise shown on the plans, tack

coat shall be applied with an approved sprayer at a rate directed by the Engineer between 0.04 and 0.10 gallon residual asphalt per square yard of surface.

F. Transporting Asphaltic Concrete. The asphaltic mixture shall be hauled to the work site in vehicles previously cleaned of all foreign material and with beds that do not discharge or lose materials during the haul. Trucks that do not meet the satisfaction of the Engineer or Inspector will not be allowed to deliver materials to City projects. The dispatching of the vehicles shall be arranged so that all material is delivered, placed, and rolled during daylight hours unless otherwise shown on the plans. In cool weather, or for long hauls, covering and insulating of the truck bodies may be required. If necessary, to prevent the mixture from adhering to the inside of the truck body, the inside of the truck may be given a light coating of release agent satisfactory to the Engineer.

G. Placement.

1. Weather Conditions. Place mixture, when placed with a spreading and finishing machine, or the tack coat when the roadway surface temperature is 60°F or higher unless otherwise approved. Measure the roadway surface temperature with a handheld infrared thermometer. Place mixtures only when weather conditions and moisture conditions of the roadway surface are suitable in the opinion of the Engineer.

The asphaltic mixture, when placed with a motor grader, shall not be placed when the surface temperature is below 65°F and is falling, but may be placed when the surface temperature is above 55°F and is rising. The maximum depth of asphalt mixture placed with a motor grader will not exceed 5 inches of compacted material.

Mat thicknesses of 1-½ inches and less shall not be placed when the temperature of the surface on which the mat is to be placed is below 60°F.

It is further provided that the tack coat or asphaltic mixture shall be placed only when the humidity, general weather conditions, temperature and moisture condition of the base are suitable.

2. Placement Temperature. If, after being discharged from the mixer and prior to placing, the temperature of the asphaltic mixture falls below 200°F, all or any part of the load may be rejected and payment will not be made for the rejected material.

3. Placement Operations. Placement and laydown operations shall be in conformance with this section and Section 205.4.H. - "Quality Control and Acceptance."

Prepare the surface by removing raised pavement markers and objectionable material such as moisture, dirt, sand, leaves, and other loose impediments from the surface before placing mixture. Remove vegetation from pavement edges.

The asphaltic mixture shall be dumped and spread on the approved prepared surface with the spreading and finishing machine. Place the mixture to meet the typical section requirements and produce a smooth, finished surface with a uniform appearance and texture. In addition, the placing of the asphaltic mixture shall be completed without tearing, shoving, gouging or segregating the mixture and without producing streaks in the mat.

Unloading into the finishing machine shall be controlled so that bouncing or jarring the spreading and finishing machine shall not occur and the required lines and grades shall be obtained without resorting to hand finishing.

When approved by the Engineer, level-up courses may be spread with a motor grader.

Construction joints of successive courses of asphaltic material shall be offset at least 6 inches. Construction joints on surface courses shall coincide with lane lines, or as directed by the Engineer.

The spreading and finishing machine shall be operated at a uniform forward speed consistent with the plant production rate, hauling capability, and roller train capacity to result in a continuous operation. The speed shall be slow enough that stopping between trucks is not ordinarily required. If, in the opinion of the Inspector, sporadic delivery of material is adversely affecting the mat, the Inspector may require paving operations to cease until acceptable methods are provided to minimize starting and stopping of the paver.

The hopper flow gates of the spreading and finishing machine shall be adjusted to provide an adequate and consistent flow of material. These shall result in enough material being delivered to the augers so that they are operating approximately 85 percent of the time or more. The augers shall provide means to supply adequate flow of material to the center of the paver. Augers shall supply an adequate flow of material for the full width of the mat, as approved by the Engineer. Augers should be kept approximately one-half to three-quarters full of mixture at all times during the paving operation.

When the asphaltic mixture is placed in a narrow strip along the edge of an existing pavement, or used to level up small areas of an existing pavement, or placed in small irregular areas where the use of a finishing machine is not practical, the finishing machine may be eliminated when authorized by the Engineer.

Adjacent to flush curbs, gutters and structures, the surface shall be finished uniformly high so that when compacted, it will be slightly above the edge of the curb or structure.

If a pattern of surface irregularities or segregation is detected, the Contractor shall make an investigation into the causes and immediately take the necessary action. With the approval of the Inspector, placement may continue for no more than one full production day from the time the Contractor is first notified and while corrective actions are being taken. If the problem still exists after that time, paving shall cease until the Contractor further investigates the causes and the Engineer approves further corrective action to be taken.

Place mixture within the compacted lift thickness shown in Table 8, unless otherwise shown on the plans or allowed.

Use the guidelines in Table 9 to establish the temperature of mixture delivered to the paver.

Table 8
Compacted Lift Thickness and Required Core Height

| Mixture Type | Compacted Lift Thickness | | Minimum Untrimmed Core Height (in.) Eligible for Testing |
|--------------|--------------------------|---------------|--|
| | Minimum (in.) | Maximum (in.) | |
| A | 3.00 | 6.00 | 2.00 |
| B | 2.50 | 5.00 | 1.75 |
| C | 2.00 | 4.00 | 1.50 |
| D | 1.50 | 3.00 | 1.25 |
| F | 1.25 | 2.50 | 1.25 |

Table 9
Suggested Minimum Mixture Placement Temperature

| High-Temperature Binder Grade | Minimum Placement Temperature (Before Entering Paver) |
|-------------------------------|---|
| PG 64 or lower | 260°F |
| PG 70 | 270°F |
| PG 76 | 280°F |
| PG 82 or higher | 290°F |

4. **Compaction.** The pavement shall be compacted thoroughly and uniformly with the necessary rollers to obtain the compaction and cross section of the finished paving mixture meeting the requirements of the plans and specifications.

The edges of the pavement along curbs, headers and similar structures, and all places not accessible to the roller, or in such positions as will not allow thorough compaction with the rollers, shall be thoroughly compacted with lightly oiled tamps.

Rolling with a trench roller will be required on widened areas, in trenches and other limited areas where satisfactory compaction cannot be obtained with the approved rollers.

- a. **In-Place Compaction Control.** Use density control unless ordinary compaction control is specified on the plans. Use the control strip method given in Tex-207-F, Part IV, to establish the rolling pattern for density controlled areas.

Where specific density or air void requirements are waived, furnish and operate compaction equipment as approved.

Do not use pneumatic-tire rollers if excessive pickup of fines by roller tires occurs. Unless otherwise directed, use only water or an approved release agent on rollers, tamps, and other compaction equipment. Keep diesel, gasoline, oil, grease, and other foreign matter off the mixture.

When rolling with the three-wheel, tandem or vibratory rollers, it is recommended that rolling start by first rolling the joint with the adjacent pavement and then continue by rolling longitudinally at the sides and proceed toward the center of the pavement, overlapping on successive trips by at least 1 foot. Alternate trips of the roller should be slightly different in length. On super-elevated curves, rolling should begin at the low side and progress toward the high side.

When rolling with vibratory steel-wheel rollers, equipment operation shall be in accordance with Item 210, "Rolling", and the manufacturer's recommendations, unless otherwise directed by the Engineer. Vibratory rollers shall not be left vibrating

while not rolling or when changing directions. In addition, vibratory rollers shall not be allowed in the vibrating mode on mats with a plan depth of less than 1-½ inches, unless approved by the Engineer.

The motion of the rollers shall be slow enough to avoid other than usual initial displacement of the mixture. If any displacement occurs, it shall be corrected to the satisfaction of the Inspector. Ensure pavement is fully compacted before allowing rollers to stand on the pavement.

(1) Ordinary Compaction Control. One three-wheel roller, one pneumatic-tire roller, and one tandem roller shall be furnished for each compaction operation except as provided below or approved by the Engineer. The use of a tandem roller may be waived by the Engineer when the surface is already adequately smooth and further steel-wheel rolling is shown to be ineffective. With approval of the Engineer, the Contractor may substitute a vibratory roller for the three-wheel roller and/or the tandem roller. Use of at least one pneumatic-tire roller is required unless approved by the Engineer. Additional or heavier rollers shall be furnished if required by the Engineer.

Rolling patterns shall be established by the Contractor to achieve the maximum compaction. The selected rolling pattern shall be followed unless changes in the mixture or placement conditions occur which affect compaction. When changes in the mixture or placement conditions occur, a new rolling pattern shall be established.

(2) Density Compaction Control. Place and compact asphaltic concrete materials in accordance with the method specified in Section 205.4.H, “Quality Control and Acceptance.”

- 5. Compaction Cessation Temperature.** Regardless of the method required for in-place compaction control, all rolling for compaction shall be completed before the mixture temperature drops below 175°F.
- 6. Opening to Traffic.** Allow the compacted pavement to cool to 160°F or lower before opening to traffic unless otherwise directed. When directed, sprinkle the finished mat with water or limewater to expedite opening the roadway to traffic.

If the surface ravel, flushes, ruts or deteriorates in any manner prior to final acceptance of the work, it will be the Contractor's responsibility to correct this condition at their expense, to the satisfaction of the Inspector and in conformance with the requirements of this specification.

H. Quality Control and Acceptance. Control and acceptance of hot mixed asphaltic concrete pavement shall be followed as specified herein or as directed on the plans. The contractor shall conduct production and placement operations in accordance with the method specified. All testing will be conducted in accordance with the testing methods shown in Table 10.

Table 10
Acceptable Production and Placement Testing Methods

| Description | Test Method |
|--|------------------------|
| Gradation including % passing the #200 sieve | Tex-200-F or Tex-236-F |
| Laboratory-molded density | Tex-207-F |
| VMA | |
| Laboratory-molded bulk specific gravity | |
| In-Place air voids | |
| Segregation (density profile) | Tex-207-F, Part V |
| Longitudinal joint density | Tex-207-F, Part VII |
| Moisture content | Tex-212-F, Part II |
| Theoretical maximum specific (Rice) gravity | Tex-227-F |
| Asphalt content | Tex-236-F |
| Hamburg Wheel test | Tex-242-F |
| Thermal profile | Tex-244-F |
| Asphalt binder sampling and testing ¹ | Tex-500-C |
| Boil test ¹ | Tex-530-C |

1. The Engineer may waive the sampling and testing requirements at their discretion.

- 1. Production Sampling and Testing.** For a given project, sample asphaltic concrete materials at the production facility every 500 tons for each mixture type supplied or as directed by the Engineer. Unless otherwise shown on the plans, a production facility that supplies the same mixture to multiple City projects on the same day will not be required to sample and test at the required frequency for every project. A single test report may be used on two or more projects to represent the quality of the mixture for that day's production.

During production, do not exceed the operational tolerances in Table 7. Stop production if testing indicates tolerances are exceeded on:

- 3 consecutive tests on any individual sieve,
- 4 consecutive tests on any of the sieves, or
- 2 consecutive tests on asphalt content.

Suspend production and shipment of mixture if the asphalt content deviates from the current JMF by more than 0.5% for any test.

Begin production only when test results or other information indicate, to the satisfaction of the Engineer, that the next mixture produced will be within Table 7 tolerances.

The Contractor shall perform a Hamburg Wheel test at the direction of the Engineer at any time during production, including when the boil test indicates a change in quality from the materials submitted for the initial JMF. If the production sample fails the Hamburg Wheel test criteria in Table 6, suspend production until further Hamburg Wheel tests meet the specified values. The Engineer may require up to the entire subplot of any mixture failing the Hamburg Wheel test to be removed and replaced at the Contractor's expense.

If the Hamburg Wheel test results in a "remove and replace" condition, the Contractor may request that the Engineer confirm the results by retesting the failing material. An Independent laboratory retained by the Engineer will perform the Hamburg Wheel tests

and determine the final disposition of the material in question based on the initial test results.

2. Placement Sampling and Testing.

- a. **In-Place Density.** For every 500 tons of compacted asphaltic material or as directed by the Engineer, test the in place density. The in place density shall be in the range of 92.0% to 97.0% of the maximum density. Do not increase the asphalt content of the mixture to increase pavement density.

Unless otherwise shown on the plans, obtain 2 roadway specimens at each location selected by the Engineer for in-place density determination. Unless otherwise determined, the Engineer will witness the coring operation and measurement of the core thickness. Unless otherwise approved, obtain the cores within 1 working day after placement is completed. Obtain two 6 inch diameter cores side-by-side from within 1 foot of the location provided by the Engineer. For Type C, D and F mixtures, 4 inch diameter cores are allowed. Mark the cores for identification.

Visually inspect each core and verify that the current paving layer is bonded to the underlying layer. If an adequate bond does not exist between the current and underlying layer, take corrective action to insure that an adequate bond will be achieved during subsequent placement operations.

Immediately after obtaining the cores, dry the core holes and tack the sides and bottom. Fill the hole with the same type of mixture and properly compact the mixture. Repair core holes with other methods when approved.

If the core heights exceed the minimum untrimmed values listed in Table 8, trim the cores within 1 working day following placement operations unless otherwise approved. If the core height before trimming is less than the minimum untrimmed value shown in Table 8, decide whether or not to include the pair of cores in the density determination for that subplot. If the cores are to be included in density determination, trim the cores. If the cores will not be included in density determination, store untrimmed cores for the Engineer.

The Engineer will measure density in accordance with Tex-207-F and Tex-227-F. Before drying to a constant weight, cores may be predried using a vacuum device, or by other methods approved by the Engineer, to remove excess moisture. The Engineer will use the average density of the 2 cores to calculate the in-place density at the selected location.

If the in-place density in the compacted mixture is below 92% or greater than 97%, change the production and placement operations to bring the in-place density within requirements. The Engineer may suspend production until the in-place density is brought to the required level, and may require a test section as described below, before proceeding.

At the onset of production, or after production and placement operations have been altered to bring the in-place density into conformance, construct a test section of 1 lane-width and at most 0.2 miles in length to demonstrate that compaction to between 92.0% and 97.0% in-place density can be obtained. Continue this procedure until a test section with the correct density can be produced. The Engineer will allow only 2

test sections per day. When a test section producing satisfactory in-place air void content is placed, resume full production.

- (1) **Shoulders and Ramps.** Shoulders and ramps are subject to in-place density testing, unless otherwise shown on the plans.
- (2) **Miscellaneous Areas.** Miscellaneous areas include areas that are not generally subject to primary traffic, such as driveways, mailbox turnouts, crossovers, gores, spot level-up areas, and other similar areas. Miscellaneous areas also include level-ups and thin overlays if the layer thickness designated on the plans is less than the compacted lift thickness shown in Table 8.

Miscellaneous areas will not be included in the in place density testing. Compact areas that are not subject to in-place air void determination in accordance with ordinary compaction control.

- b. **Segregation (Density Profile).** If shown on the plans, test for segregation using density profiles in accordance with Tex-207-F, Part V. Provide the Engineer with the results of the density profiles as they are completed. Areas defined as “Miscellaneous Areas,” are not subject to density profile testing.

If density profiles are required by the plans, perform a density profile every time the screed stops, on areas that are identified by either the Contractor or the Engineer as having thermal segregation, and on any visibly segregated areas. If the screed does not stop, and there are no visibly segregated areas or areas that are identified as having thermal segregation, perform a minimum of 1 profile per 500 tons of compacted material or as directed by the Engineer.

Reduce the test frequency to a minimum of 1 profile per 2,000 tons of compacted material, or as directed by the Engineer, if 4 consecutive profiles are within established tolerances. Continue testing at this frequency unless a profile fails, at which point resume testing at a minimum frequency of 1 per 500 tons or as directed by the Engineer. The Engineer may further reduce the testing frequency based on a consistent pattern of satisfactory results.

Unless otherwise shown on the plans, the density profile is considered failing if it exceeds the tolerances in Table 11. No production or placement bonus will be paid for any subplot that contains a failing density profile. The Engineer may make as many independent density profile verifications as deemed necessary. The Engineer’s density profile results will be used when available.

Investigate density profile failures and take corrective actions during production and placement to eliminate the segregation. Suspend production if 2 consecutive density profiles fail, unless otherwise approved. Resume production after the Engineer approves changes to production or placement methods.

Table 11
Segregation (Density Profile) Acceptance Criteria

| Mixture Type | Maximum Allowable Density Range (Highest to Lowest) | Maximum Allowable Density Range (Average to Lowest) |
|--------------------------|---|---|
| Type A & Type B | 8.0 pcf | 5.0 pcf |
| Type C, Type D, & Type F | 6.0 pcf | 3.0 pcf |

c. Longitudinal Joint Density.

- (1) Informational Tests.** While establishing the rolling pattern, perform joint density evaluations and verify that the joint density is no more than 3.0 pounds per cubic foot below the density taken at or near the center of the mat. Adjust the rolling pattern if needed to achieve the desired joint density. Perform additional joint density evaluations at least once per subplot unless otherwise directed.
- (2) Record Tests.** If shown on the plans, for each 500 tons of compacted material or as directed by the Engineer, perform a joint density evaluation at each pavement edge that is or will become a longitudinal joint. Determine the joint density in accordance with Tex-207-F, Part VII. Record the joint density information and submit results to the Engineer. The evaluation is considered failing if the joint density is more than 3.0 pounds per cubic foot below the density taken at the core random sample location and the correlated joint density is less than 90.0%. The Engineer may make independent joint density verifications at the random sample locations. The Engineer's joint density test results will be used when available.

Investigate joint density failures and take corrective actions during production and placement to improve the joint density. Suspend production if 2 consecutive evaluations fail unless otherwise approved. Resume production after the Engineer approves changes to production or placement methods.

- d. Recovered Asphalt DSR.** The Engineer may take production samples or cores from suspect areas of the project to determine recovered asphalt properties. Asphalt binders with an aging ratio greater than 3.5 do not meet the requirements for recovered asphalt properties and may be deemed defective when tested and evaluated by the Engineer. The aging ratio is the dynamic shear rheometer (DSR) value of the extracted binder divided by the DSR value of the original unaged binder (including RAP binder). DSR values are obtained according to AASHTO T 315 at the specified high temperature performance grade of the asphalt. The binder from RAP will be included proportionally as part of the original unaged binder. The Engineer may require removal and replacement of the defective material at the Contractor's expense. The asphalt binder will be recovered for testing from production samples or cores using Tex-211-F.
- e. Irregularities.** Immediately take corrective action if surface irregularities, including but not limited to segregation, rutting, raveling, flushing, fat spots, mat slippage, color, texture, roller marks, tears, gouges, streaks, or uncoated aggregate particles, are detected.

The Engineer may allow placement to continue for at most 1 day of production while taking appropriate action. If the problem still exists after that day, suspend paving until the problem is corrected to the satisfaction of the Engineer.

At the expense of the Contractor and to the satisfaction of the Engineer, remove and replace any mixture that does not bond to the existing pavement or that has other surface irregularities identified above.

3. **Individual Loads of Hot Mix.** The Engineer can reject individual truckloads of hot mix. When a load of hot mix is rejected for reasons other than temperature, the Contractor may request that the rejected load be tested. Make this request within 4 hr. of rejection. The Engineer will sample and test the mixture. If test results are within the operational tolerances shown in Table 7, payment will be made for the load. If test results are not within operational tolerances, no payment will be made for the load and the Engineer may require removal.
 4. **Ride Quality.** When required by the plans, measure ride quality in accordance with TxDOT Standard Specification Item 585, "Ride Quality for Pavement Surfaces." Surface Test Type A or B as well as Pay Schedule 1, 2, or 3 shall also be indicated on the plans.
- 205.5. MEASUREMENT:** Hot Mix Asphaltic Concrete Pavement shall be measured by square yard, complete in place, for the thickness specified on the plans. Limits of payment will be from face of curb to face of curb. Pavement area shall not exceed the limits shown on the plans without written authorization.
- 205.6. PAYMENT:** The work performed and materials furnished, as described by this item and measured as provided herein, shall be paid for at the contract unit bid price per square yard specified on the plans of "Hot Mix Asphaltic Concrete Pavement," which price shall be full compensation for furnishing and placing all materials, and for all labor, tools, equipment, and incidentals necessary to complete the work. The prime coat and tack coat, when required, shall be paid under the provisions of Item Nos. 202 and 203, respectively.

Trial batches will not be paid for unless they are incorporated into pavement work approved by the Engineer.

Pay adjustment for ride quality, when required on the plans, will be determined in accordance with TxDOT Standard Specification Item 585, "Ride Quality for Pavement Surfaces."

205.7. BID ITEM:

Item 205.1 - Hot Mix Asphaltic Pavement Type A - per square yard __ inches pavement thickness

Item 205.2 - Hot Mix Asphaltic Pavement Type B - per square yard __ inches pavement thickness

Item 205.3 - Hot Mix Asphaltic Pavement Type C - per square yard __ inches pavement thickness

Item 205.4 - Hot Mix Asphaltic Pavement Type D - per square yard __ inches pavement thickness

Item 205.5 - Hot Mix Asphaltic Pavement Type F - per square yard __ inches pavement thickness

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ITEM NO. 299

Flowable Fill

299.1 DESCRIPTION: The work covered by this item consists of furnishing, transporting, mixing, testing and installing flowable fill. Flowable fill is a concrete material suitable as a backfill for utility trenches, abandoned pipes, manholes and valves. It is a heavy material and will exert a high fluid pressure against any forms, embankment, or wall used to contain backfill.

299.2 REFERENCE STANDARDS: Reference standards cited in this Specification Item No. 299 refer to the current reference standard published at the time of the latest revision date.

1. San Antonio Water System (SAWS):
 - a. Specifications for Water and Sanitary Sewer Construction
 - b. SAWS Materials Specifications
2. City of San Antonio (COSA) Standard Specifications for Construction
 - a. ASTM C 31 – Making and Curing Concrete Test Specimens in the field.
 - b. ASTM C 39 – Compressive Strength of Cylindrical Concrete Specimens.
 - c. ASTM C 40 – Organic Impurities in Fine Aggregates for Concrete.
 - d. ASTM C 94 - Ready-Mixed Concrete.
 - e. ASTM C 150 - Portland Cement.
 - f. ASTM C 192 – Making and Curing Concrete Test Specimens in the Laboratory.
 - g. ASTM C 260 – Air-Entraining Admixtures for Concrete.
 - h. ASTM C 494 - Chemical Admixtures for Concrete.
 - i. ASTM C 618 – Coal Fly Ash and Raw or Calcined Natural Pozzolan for use as a Mineral Admixture in Concrete.
3. ASTM C 4318 – Liquid Limit, Plastic Limit and Plasticity Index of Soils. Texas Department of Transportation (TxDOT)
 - a. TxDOT DMS-4600 Hydraulic Cement
 - b. TxDOT DMS-4610 Fly Ash
 - c. TxDOT DMS 4640 Chemical Admixtures for Concrete
 - d. Tex-401-A
 - e. TxDOT Tex-106-A
 - f. TxDOT-Tex-418-A
 - g. TxDOT-Tex-447-A

299.3 SUBMITTALS:

1. All submittals shall be in accordance with Engineer's requirements. All submittals shall be approved by the Engineer and acknowledge by the Inspector prior to delivery of materials and commencing any portion of the proposed scope of work.
 - a. Submit proposed mix design. Mix design shall state the following information:
 - 1) Mix design number or code designation to order the concrete from the supplier.

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- 2) Design strength at 7 days (unless otherwise noted on the Plans).
- 3) Cement type and brand.
- 4) Fly ash type and brand.
- 5) Admixtures type and brand.
- 6) Proportions of each material used.
- 7) Submit a copy of delivery tickets accompanied by batch tickets, providing the information required by ASTM C 94 to SAWS Inspector in the field at time of delivery.

299.4 MATERIALS:

1. Cement. Furnish hydraulic cement that meets the requirements of TxDOT’s DMS-4600, “Hydraulic Cement,” TxDOT’s Hydraulic Cement Quality Monitoring Program (HCQMP), and ASTM C-150 Type I Portland Cement. Sources not on the HCQMP or other sources to be used in combination with an approved source will require approval before use.
2. Fly Ash. Furnish fly ash conforming to TxDOT DMS-4610, “Fly Ash.”
3. Chemical Admixtures. Furnish chemical admixtures conforming to TxDOT DMS-4640, Chemical Admixtures for Concrete.
4. Fine Aggregate. Provide fine aggregate that will stay in suspension in the mortar to the extent required for proper flow and that meets the gradation requirements of Table 1. Test fine aggregate gradation in accordance with TxDOT standard laboratory test procedure Tex-401-A. Plasticity Index (PI) must not exceed 6 when tested in accordance with TxDOT standard laboratory test procedure Tex-106-A.
5. Mixing Water. Use mixing water conforming to the requirements of Specification Item No. 300, Concrete (Natural Aggregate).

| Table 1 Aggregate Gradation Chart | |
|--|------------------------|
| <i>Sieve Size</i> | <i>Percent Passing</i> |
| ¾ inch | 100 |
| No.200 | 0-30 |

299.5 CONSTRUCTION: Unless otherwise shown on the plans, furnish a mix meeting the requirements of this section as set forth below.

1. Strength. The compressive strength range shall be between the following strength values unless otherwise directed by the Engineer or shown on the plans:
 - a. Low Strength. Between 80 psi and 150 psi at 28 days,
 - b. High Strength. Greater than 500 psi at 28 days. For emergency repairs, strength shall be greater than 50 psi at 2 hours.
2. Consistency. Design the mix to be placed without consolidation and to fill all intended voids.
 - a. Fill an open-ended, 3 inch diameter by 6 inch high cylinder to the top to test the consistency.
 - b. Immediately pull the cylinder straight up. The correct consistency of the mix must produce a minimum 8 inch diameter circular spread with no segregation.

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- c. When necessary, use specialty type admixtures to enhance the flowability, reduce shrinkage, and reduce segregation by maintaining solids in suspension.
 - d. All admixtures must be used and proportioned in accordance with the manufacturer's recommendations.
 - e. Mix the flowable fill using a central-mixed concrete plant, ready-mix concrete truck, pug mill, or other approved method.
3. Shrinkage and Bleeding. Limit shrinkage to 0.5% or less based upon the results from ASTM C 827, "Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixtures."
- a. Batch, mix and transport flowable fill in accordance with ASTM C 94, except when directed otherwise by the Engineer.
 - b. Mix flowable fill in quantities required for immediate use. Do not use portions which have developed initial set or which are not in place within 90 minutes after the initial water has been added.
 - c. Do not mix flowable fill while the air temperature is at or below 35 degrees F without prior approval from the Engineer.
 - d. Monitor and control the fluid pressure during placement of flowable fill prior to set. Take appropriate measures to avoid excessive pressure that may damage or displace structures or cause flotation. Cease operations if flowable fill is observed leaking from the area.
 - e. Repair or replace damaged or displaced structures at no additional cost to SAWS.
 - f. Clean up excess flowable fill discharged from the work area and remove excess flowable fill from pipes at no additional cost to SAWS.

299.6 TESTING: Testing shall be in accordance with TxDOT standard laboratory test procedure Tex-418-A

1. Contractor to furnish all labor, equipment, tools, containers, and molds required for sampling, making, transporting, curing, removal, and disposal of test specimens. Furnish test molds meeting the requirements of TxDOT standard laboratory test procedure Tex-447-A
2. Two specimens are required for a strength test, and the compressive strength is defined as the average of the breaking strength of the 2 cylinders.
3. Contractor to transport, strip, and cure the test specimens as scheduled at the designated location.
4. Cure test specimens in accordance with TxDOT standard laboratory test procedure Tex-447-A.
5. The Contractor will sample, take, and test all quality control testing.
6. Contractor to dispose of used, broken specimens in an approved location and manner.
7. The frequency of job control testing will be at the direction of the Engineer.
8. SAWS will be responsible for quality assurance testing.

299.7 MEASUREMENT: This Item will be measured by the cubic yard of material placed of accepted work complete in place.

1. Measurement will not include additional volume caused by slips, slides, or cave-ins resulting from the Contractor's operations.

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PAYMENT: The work performed and materials furnished in accordance with this Item and measured as provided under “Measurement” is for full compensation for furnishing, hauling, and placing materials and for equipment, tools, labor, and incidentals and will be paid for at the unit price bid for “Flowable Fill (Low Strength),” “Flowable Fill (High Strength),” or “Flowable Fill (High Strength emergency Repair)” for Pipe. Flowable Fill shall be paid for at the contract unit price per cubic yard based on the maximum trench widths as established per SAWS Construction Specification Item No. 804, schedule of pay or as indicated on the contract plans and is for full compensation for furnishing, hauling, and placing materials and for equipment, tools, labor, and incidentals.

The use of flowable fill around manholes as per specification items Nos. 850, 851, 852, 853, and 855 is incidental and there will be no additional separate payment item for the material.

-End of Specification -

ITEM

530 BARRICADES, SIGNS, AND TRAFFIC HANDLING

530.1. DESCRIPTION: *This item shall govern for providing, installing, moving, repairing, maintaining, cleaning and removing upon completion of work, all barricades, signs, cones, lights and other such type devices and of handling traffic as indicated on the plans or as directed by the Engineer.*

530.2. GUIDELINES FOR BARRICADING ON CITY RIGHT-OF-WAY: The barricade contractor must locally maintain sufficient materials in stock to accommodate three or more construction phases per project. These will include all applicable traffic control sign types, trucks, trailers, arrow boards, and all other traffic control devices assigned to the Contractor's barricading operation.

The *Texas Manual on Uniform Traffic Control Devices (TMUTCD)*, Section 6A-6, requires the appropriate training for all personnel who are involved in the selection, placement, and maintenance of traffic control devices on construction projects. The City of San Antonio requires that all personnel associated with barricading operations and traffic handling possess certificates from either of the two groups listed in Table 1 below. Each certificate will be valid for four years.

**Table 1
Barricading Training**

| Texas Engineering Extension Service | American Traffic Safety Service Association |
|-------------------------------------|--|
| Work Zone Traffic Control | Training Course for Worksite Traffic Supervisors |

The Contractor shall have a minimum of one barricade supervisor and three persons who are responsible for construction work zone traffic control. These persons shall be based in the San Antonio metropolitan area and their sole tasks shall be implementing and maintaining construction work zone traffic control devices.

The Contractor shall have a commercial telephone answering service during non-working hours. The Contractor shall provide the City during working hours with an office telephone number, pager number, and cellular telephone number to contact the barricading supervisor. The contractor must be able to respond to any call within two hours. The barricading contractor or General Contractor must possess liability insurance in the minimum amount of one million dollars. A copy of the liability policy must be sent to the City Traffic Engineer for approval 48 hours prior to starting barricading operations.

The contractor shall comply with all standards set forth in the plan barricade detail sheets. One noncompliance letter issued by the City to the Contractor in regard to construction work zone traffic control, and not corrected within 48 hours, will be cause for delay of payment for this item.

If the general contractor elects to do his own barricading, he must comply with all the foregoing requirements. Additionally, a general contractor will be required to submit a traffic control plan (TCP) at least 72 hours in advance (excluding weekends and holidays) of starting work in each construction phase. Upon satisfactory evidence of competent barricading expertise, this requirement for a traffic control plan may be waived by the City Traffic Engineer.

530.3. EQUIPMENT: Provide the machinery, tools and equipment necessary for proper prosecution of the work. All machinery, tools and equipment used shall be maintained in a satisfactory and workmanlike manner.

530.4. CONSTRUCTION: All barricades, signs, and other types of devices listed above shall conform to the requirements of the TMUTCD. It is the contractor's responsibility to see that all traffic control devices are properly installed and maintained at the job site. If it is determined by the Traffic Engineering Representative that the traffic control devices do not conform to the established standards, or are incorrectly placed to protect the general public, the Traffic Engineer shall have the option to stop the work, at no expense to the City, until the situation is corrected by the Contractor. If it is determined that additional temporary traffic control devices, special directional devices, and/or business name signs are required, they will be provided by the contractor at no additional cost. As work progresses, the location of temporary traffic control devices will be adjusted and modified as necessary by the Contractor.

All retro reflective traffic control devices such as barricades, vertical panels, signs, etc., shall be maintained by cleaning, replacing or a combination thereof such that during darkness and rain, the retro reflective characteristics shall equal or exceed the retro reflective characteristics of the standard reflective panels in the Inspector's possession.

The contractor shall contact the City of San Antonio Traffic Operations Section prior to removing any traffic signs or traffic signals. Prior to completion of the contract and removal of barricades, all applicable permanent traffic signs and signals must be in place and functioning properly. All permanent signs or traffic control devices missing or damaged during construction shall be replaced at the contractor's expense. Permanent pavement marking shall be applied prior to the opening of any street to traffic. Temporary short-term expendable pavement markings may be provided prior to application of permanent markings.

The contractor must maintain all streets open to through traffic by repairing trenches, potholes, etc., at no direct payment. The contractor shall provide reasonable access to residences and all businesses within all phases of the work, as well as providing suitable access accommodations for school children, pedestrians, garbage pick-up and mail delivery by the US Postal Service. Temporary pedestrian crossing will be determined in the field by the Police Department School Services Unit. Temporary pedestrian crossings shall be 4 feet wide by 4 inches thick asphalt treated base or asphaltic concrete and will be paid for under Item 206, "Asphalt Treated Base" or Item 205, "Hot Mix Asphaltic Concrete Pavement," respectively.

When flagging is required by the plans or Traffic Control Plan, provide a Contractor representative who has been certified as a flagging instructor through courses offered by the Texas Engineering Extension Service, the American Traffic Safety Services Association, the National Safety Council, or other approved organizations. Provide the certificate indicating course completion when requested. This representative is responsible for training and assuring that all flaggers are qualified to perform flagging duties. A qualified flagger must be independently certified by one of the organizations listed above or trained by the Contractor's certified flagging instructor. Provide the Engineer with a current list of qualified flaggers before beginning flagging activities. Use only flaggers on the qualified list.

Flaggers must be courteous and able to effectively communicate with the public. When directing traffic, flaggers must use standard attire, flags, signs, and signals and follow the flagging procedures set forth in the TMUTCD.

530.5. MEASUREMENT: This item will be measured by "Lump Sum" as indicated on the plans.

530.6. PAYMENT: This item will be paid for at the contract lump sum price bid for “barricades, signs, and traffic handling”. This price shall be full compensation for furnishing all labor, materials, supplies, equipment and incidentals necessary. To complete the work as specified. The lump sum price will be pro-rated based on the number of workdays in the project contract. Failure to complete the work within time allowed in the project contract due to approving designs, testing, material shortages, closed construction season, curing periods, and testing periods will not qualify for additional compensation. When additional work is added by an approved field alteration or when work is suspended for the convenience of the City, through no fault of the contractor, additional compensation may be paid to the Contractors.

530.7. BID ITEM:

Item 530.1 - Barricades, Signs and Traffic Handling - lump sum

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ITEM NO. 550

Trench Excavation Safety Protection

550.1 DESCRIPTION: This item shall govern the trench excavation safety protection required for the construction of all trench excavation protection systems to be utilized in the project and including all additional excavation and backfill necessitated by the protection system.

550.2 REFERENCED STANDARDS: Reference standards cited in this Specification Item No. 550 refer to the current reference standard published at the time of the latest revision

1. San Antonio Water System (SAWS):
 - a. Specifications for Water and Sanitary Sewer Construction
 - b. SAWS Materials Specifications
2. City Of San Antonio (COSA) Standard Specifications for Construction
3. Texas Commission of Environmental Quality (TCEQ)
 - a. Chapter 217 Design Criteria for Domestic Wastewater Systems
 - b. Chapter 213 Edwards Aquifer
 - c. Chapter 290; Subchapter D – Rules and Regulations for Public Drinking Water
4. Occupational Safety and Health Administration (OSHA).
 - a. Federal Regulations, 29 CFR, Part 1926, Standards – Safety and Health Regulations for Construction – Subpart P Excavation,

550.3 SUBMITTALS: Contractor shall submit manufacturer's product data, instructions recommendations, shop drawings, and certifications. All submittals shall be in accordance with Engineer's requirements and submittals shall be approved prior to delivery.

1. Submit a safety program specifically for the construction of trench excavation. Design the trench safety program to be in accordance with OSHA 29CFR standards governing the presence and activities of individuals working in and around trench excavations.
2. Construction and shop drawings containing deviations from OSHA standards or special designs shall be sealed by a Professional Engineer Licensed in the State of Texas retained and paid by Contractor.
3. Review of the safety program by Engineer will only be in regard to compliance with specification and will not constitute approval by Engineer nor relieve Contractor of obligations under State and Federal trench safety laws.
4. Submit certification that trench safety system will not be subjected to loads exceeding those which the system was designed to withstand according to the available construction and geotechnical information.
5. An excavation plan submittal signed and sealed by a Texas licensed professional engineer shall be submitted for review and acceptance by the SAWS' Representative, if applicable, prior to the delivery of materials and commencing

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any portion of proposed construction activities where the planned excavation is 20 feet or greater.

550.4 CONSTRUCTION: Trench excavation safety protection shall be accomplished as required by the latest provision of Part 1926, Subpart P – Excavations, Trenching, and Shoring of the OSHA Standards and Interpretations, or the most approved equal provision.

1. A trench shall be defined as a narrow excavation made below the surface of the ground or pavement. In general, the depth is greater than the width, but the width of a trench is not greater than 15 feet.
2. If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet or less (measure at the bottom of the excavation), the excavation is also considered to be a trench.
3. In addition, "Trench Excavation Protection" will not be limited to these applications, but may be used whenever deemed expedient and proper to ensuing work.

550.5 MEASUREMENT: Trench Excavation Safety Protection shall be measured by the linear foot along the centerline of any OSHA defined trench that may be entered by personnel and is not greater than 15 feet wide, including manholes and other structures.

550.6 PAYMENT: Payment for Trench Excavation Safety Protection, measured as described above, shall be made at the unit price bid per linear foot of Trench Excavation Safety Protection regardless of the depth of the trench.

1. Payment shall include all components of the Trench Excavation Safety Protection System which can include, but not be limited to, sloping, sheeting, trench boxes or trench shields, sheet piling, cribbing, bracing, shoring, dewatering or temporary diversion and proper recapture and transportation of water to provide adequate drainage.
2. Payment shall also include the additional excavation and backfill required, any jacking, jack removal, and removal of the trench supports after completion.
3. Payment of all work prescribed under this item shall be full compensation for all additional excavation and backfill associated with the item; for any retention by Contractor of structural design/geotechnical/safety/equipment consultant; for furnishing, placing and removing all shoring, sheeting, or bracing; for dewatering or temporary diversion and proper recapture and transportation of water; for all jacking and jack removal; and for all other labor, material, tools, equipment and incidentals necessary to complete this portion of the work.

- End of Specification -

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ITEM NO. 804

Excavation, Trenching and Backfill

804.1 DESCRIPTION: This section shall govern the excavation, trenching, and backfilling for water, sanitary sewer, and recycled water construction, unless otherwise noted in the contract documents. The work shall include all necessary drainage, dewatering, pumping, bailing, sheeting, shoring and incidental construction.

804.2 REFERENCE STANDARDS: Reference standards cited in this Specification Item No. 804 refer to the current reference standard published at the time of the latest revision

1. San Antonio Water System (SAWS):
 - a. Specifications for Water and Sanitary Sewer Construction
 - b. SAWS Materials Specifications
2. City Of San Antonio (COSA) Standard Specifications for Construction
3. Texas Commission of Environmental Quality (TCEQ)
 - a. Chapter 217 Design Criteria for Domestic Wastewater Systems
 - b. Chapter 290; Subchapter D – Rules and Regulations for Public Drinking Water
4. American Society for Testing and Materials (ASTM) International:
 - a. ASTM C 12 - Standard Practice for Installing Vitrified Clay Pipe Lines.
 - b. ASTM C76- Standard Specification for Reinforced Concrete Culverts, Storm Drain, and Sewer Pipe.
 - c. ASTM D 1556 - Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method.
 - d. ASTM D 2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity Flow Applications.
 - e. ASTM D 2487 - Standard Classification of Soils for Engineering Purposes.
 - f. ASTM D 6938 - Test Method for in place Density and Water

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- Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
- g. ASTM D 4318 - Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
 - h. ASTM D 558 - Standard Test Methods for Moisture-Density Relations of Soil Cement Mixtures.
 - i. ASTM D 698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600kN-m/m³)).
5. American Association of State Highway and Transportation Officials (AASHTO)
- a. AASHTO M306: Standard Specification for Drainage, Sewer, Utility, and Related Castings.
6. Occupational Safety and Health Administration (OSHA).
- a. Federal Regulations, 29 CFR, Part 1926, Standards – Safety and Health Regulations for Construction – Subpart P Excavation,
7. International Organization of Standardization (ISO)
- a. ISO9001 Standards
8. Texas Department of Transportation (TxDOT)
- a. TxDOT Tex-101-E - Preparing Soil and Flexible Base Materials for Testing.
 - b. TxDOT Tex-110-E - Particle Size Analysis of Soils.
 - c. TxDOT Tex-112-E – Test Procedure for admixing Lime to Reduce Plasticity Index of Soils
 - d. TxDOT Tex-113-E - Laboratory Compaction Characteristics and Moisture-Density Relationship of Base Materials
 - e. TxDOT Tex-114 -E- Laboratory Compaction Characteristics and Moisture-Density Relationship of Subgrade, Embankment Soils, and Backfill Material
 - f. TxDOT Tex-142- E –Laboratory Classification of Soils for Engineering Purposes

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804.3 SUBMITTALS: All submittals shall be in accordance with Engineer's requirements. All submittals shall be approved by the Owners' Representative prior to delivery of materials and commencing any portion of the proposed scope of work.

1. Contractor to submit cut sheets when applicable.
 - a. No trenching will commence until cut sheets have been approved by SAWS' Representative.
 - b. The depths of cuts indicated on the cut sheet, are from the center line hub elevation to the invert of the pipe.
2. Submit detailed trench plans, shoring system designs, installation sequences, and flowable fill mix designs.
3. Submit planned typical method of excavation, backfill placement and compaction including:
 - a. Trench widths
 - b. Procedures for foundation and pipe zone bedding placement, and trench backfill compaction
 - c. Procedures for assuring compaction against undisturbed soil when pre-manufactured trench safety systems are proposed.
 - d. An excavation plan submittal signed and sealed by a Texas licensed professional engineer shall be submitted for review and acceptance by the SAWS' Representative, if applicable, prior to the delivery of materials and commencing any portion of proposed construction activities where the planned excavation is 20 feet or greater.
4. Submit trench excavation safety program in accordance with requirements of Specification Item No. 550 Trench Excavation Safety Protection
5. Submit record of location of utilities as installed, referenced to survey control points. Include:
 - a. Locations of utilities encountered or rerouted.
 - b. Give stations, horizontal dimensions, elevations, inverts, and gradients.
6. Submit detailed drawing with plotted utility or obstruction location to SAWS' Representative.
7. Submit Emergency Action Plan (EAP) to address contingency plans in the event of damage to utilities. Include the following:

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- a. Contact personnel and agencies including primary and secondary telephone, numbers,
 - b. Contractor's hierarchy of responsible personnel,
 - c. Traffic control measures, and
 - d. Identification of resources to be available on or near project site in event of damage to utilities.
8. Submit backfill material sources and product quality information in accordance with requirements of this specification.

804.4 MATERIALS: The Contractor shall procure, store, and place materials from either onsite or offsite sources which comply with the specified requirements.

1. The use of sand backfill is not allowed, unless sand is native soil to trenchline, is clean, and is approved by SAWS' Engineer.
2. Backfilling for pipelines is divided into three (3) separate zones:
 - a. Bedding: the material in the trench bottom in direct contact with the bottom of the pipe;
 - b. Initial backfill: is defined as backfill having a thickness in its compacted state from the surface of the bedding to a point 1 foot above the top of the pipe.
 - c. Secondary backfill: the backfill zone extending from the initial backfill surface to the top of the trench.
 - d. Materials and placement for each of the zones shall be as described herein
3. Trench Bottom Materials:
 - a. Stable Material: Existing stable material present during excavation includes:
 - (1) Trench bottom (free of water, muck, debris);
 - (2) Rock in boulder, ledge or coarse gravel (particle size not larger than 1- ¾ inch) formations;
 - (3) Coarse sand and gravels with maximum particle size of 1- ¾ inch, various graded sands and gravels containing small percentages of fines, generally granular and non-cohesive either wet or dry; and

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- (4) Fine sands and clayey gravels; fine sand, sand-clay mixtures, clay and gravel-clay mixtures.
- b. Unstable Material: Existing unstable materials are silt, muck, trash or debris in the trench bottom bearing level; rock on boulder ledge or coarse gravel (particle size larger than 1- 3/4 inch) formations.
- 4. See Table 1 for an outline of the bedding and initial backfill requirements for various pipe materials.

| TABLE 1 | | | | | | |
|--|------------------|-------------------------|------------------|-------------------------|------------------|-------------------------|
| BEDDING AND INITIAL BACKFILL REQUIREMENTS | | | | | | |
| | UNSTABLE | | STABLE* | | ROCK | |
| | Bedding | Initial Backfill | Bedding | Initial Backfill | Bedding | Initial Backfill |
| WATER | 6" or D/8 | 1.0' above | 6" or D/8 | 1.0' above pipe | 6" or D/8 | 1.0' above pipe |
| CSC | Modified Grade 5 | Modified Grade 5 | Modified Grade 5 | Modified Grade 5 | Modified Grade 5 | Modified Grade 5 |
| DI | Modified Grade 5 | Modified Grade 5 | Modified Grade 5 | Modified Grade 5 | Modified Grade 5 | Modified Grade 5 |
| PVC | Modified Grade 5 | Modified Grade 5 | Modified Grade 5 | Modified Grade 5 | Modified Grade 5 | Modified Grade 5 |
| HDPE | Modified Grade 5 | Modified Grade 5 | Modified Grade 5 | Modified Grade 5 | Modified Grade 5 | Modified Grade 5 |
| WSP | Modified Grade 5 | Modified Grade 5 | Modified Grade 5 | Modified Grade 5 | Modified Grade 5 | Modified Grade 5 |
| SEWER | 6" or D/8 | 1.0' above pipe | 6" or D/8 | 1.0' above pipe | 6" or D/8 | 1.0' above pipe |
| RIGID | sewer gravel | sewer gravel | sewer gravel | sewer gravel | sewer gravel | sewer gravel |
| FLEXIBLE | sewer gravel | sewer gravel | sewer gravel | sewer gravel | sewer gravel | sewer gravel |

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NOTE: The use of sand backfill is not allowed, except as secondary backfill if sand is native soil to trenchline, is clean, and is approved by SAWS' Engineer.

CSC = Concrete Steel Cylinder

DI = Ductile Iron

HDPE = High Density Polyethylene Pipe.

PVC = Polyvinyl Chloride

WSP = Tape Wrapped Steel Pipe.

D = Outside Diameter of Pipe

5. Sanitary Sewer Backfill:

a. Bedding Material:

- (1) The existing material at the bearing level shall be removed and replaced to a minimum depth of 6 inches or 1/8 of the outside diameter of the pipe, whichever is greater, with bedding material.
- (2) The bedding material shall extend up the sides of the pipe sufficient to embed the lower quadrant of the pipe.
- (3) The bedding material shall be composed of well-graded, crushed stone or gravel conforming to the requirements of Table 2 unless modified by the Engineer in writing.

| Table 2 | |
|--|----------------|
| Sanitary Sewer Backfill Materials | |
| Sewer Gravel | Percent |
| Passing 1- 1/2 inch sieve | 100 |
| Passing 1 inch sieve | 95 to 100 |
| Passing 1/2 inch sieve | 25 to 60 |
| Passing No. 4 sieve | 0 to 10 |
| Passing No. 8 sieve | 0 to 5 |

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6. Potable Water and Recycle Mains Backfill

a. Bedding Material:

- (1) The existing material at the bearing level shall be removed and replaced to a minimum depth of 6 inches or 1/8 of the outside diameter of the pipe, whichever is greater, with bedding material.
- (2) The bedding and initial backfill materials for concrete steel cylinder pipe (CSC), ductile iron pipe (DI), Wrapped Steel (WS) Pipe, High Density Polyethylene Pipe (HDPE) and Polyvinyl Chloride Pipe (PVC) in all nominal diameters shall be composed of well graded crushed stone or gravel conforming to the requirements of Table 3 unless modified by the Engineer in writing.

| Table 3 | |
|--|----------------|
| Modified Grade 5 Backfill Materials | |
| Modified Grade 5 | Percent |
| Passing 1/2 inch sieve | 100 |
| Passing 3/8 inch sieve | 95 to 100 |
| Passing No. 4 sieve | 20 to 80 |
| Passing No. 10 sieve | 0 to 25 |
| Passing No. 20 sieve | 0 to 2 |

b. Where copper or HDPE services (3/4" – 2") are installed, initial backfill shall be sand conforming to the following requirements:

- (1) Natural sand or sand produced from crushed gravel or crushed rock maximum 1/4 inch free from clay and organic material conforming to the requirements of Table 4 unless modified by the Engineer.
- (2) Larger services utilizing DI pipe or PVC (C-900) pipe shall be backfilled the same as mains and conform to the

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requirements of Table 3 unless modified by the Engineer in writing.

| Table 4 | |
|------------------------------------|----------------|
| Sand Backfill- For Services | |
| Sand No. | Percent |
| Passing No. 4 Sieve | 95 |
| Passing No. 200 sieve | 8 |

804.5 CONSTRUCTION: All existing utilities shall be protected from damage during the excavation and backfilling of trenches and, if damaged, shall be replaced by the Contractor at their own expense.

1. General:

- a. Unless otherwise shown in the contract documents, **all excavation shall be unclassified and shall include all materials encountered regardless of their nature or the manner in which they are removed, to include but not limited to groundwater, water, rock, stone, sand, concrete, organic material, existing abandoned utility lines whether shown on the plans or not, or any kind of material that is encountered.**
- b. Trenches shall not be backfilled until constructed structures or appurtenances, as installed, conform to all requirements specified.
 - (1) Failure to comply will require Contractor to re-excavate trench at no expense to SAWS.
- c. Where pipe is specially coated or sleeve/tape wrapped for protection against corrosion, care shall be taken not to damage the coating or sleeve/tape wrap.
 - (1) Damage to be assessed by Manufacturer and repaired to manufacture’s recommendation at no expense to SAWS.
- d. Where a trench has been improperly backfilled, or settlement occurs, the identified section shall be excavated to the trench depth and a length 50 feet in both directions of the failed area, then refilled and compacted to the grade and compaction level required.

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- e. Safety Devices: The Contractor shall provide and maintain barricades, flags, road flares, and other safety devices as required by local, state, and federal codes and ordinances and conduct work to create a minimum inconvenience to the public.
 - f. Temporary suspension of work does not relieve Contractors' responsibility of the above requirements.
 - g. Safety and Health Regulations: The Contractor shall at all times conform to all of the latest applicable regulations of 29 CFR Part 1926 Subpart "P" entitled Excavation, of OSHA Safety and Health Regulations for Construction," or most applicable approved equal provisions, and all other applicable state and local rules and regulations.
 - h. Archaeological (Unidentified Archaeological Sites): If the Contractor should encounter a section of an archeological feature, such as a acequia (early Spanish irrigation ditch) or any other archaeological deposits during construction operations, the Contractor must stop excavation immediately and contact the SAWS' Engineer and SAWS' Inspector, who will call the City of San Antonio Historic Preservation Officer at (210) 207-0035 for an archaeological investigation as per Section 35-432.3 of the City Code, "Unidentified Sites Archaeological."
 - (1) The Contractor cannot begin excavation again without written permission from SAWS.
 - (2) If more than three days are required for investigation (not including holidays and weekends) and the Contractor cannot work on other project scope items, the Contractor will be permitted to negotiate for additional construction time through a Request for Information (RFI).
 - i. The RFI shall be submitted within ten days after date of the first notice, additional standby time will not be considered.
 - (3) If the time required for investigation does not exceed three days for each event, contract duration will not be extended.
2. Excavation: The Contractor shall perform all excavation of every description and of all substances, including rock, encountered to the lines and grades shown in the contract documents or as determined by the Engineer.

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- a. During excavation, material suitable for backfilling shall be stockpiled in an orderly manner a safe distance from the banks of the trench to avoid overloading and to prevent slides or cave-ins as per 29 CFR Part 1926 Subpart “P” entitled Excavation, of OSHA Safety and Health Regulations for Construction,”
 - b. All excavated materials not required or suitable for backfill shall be removed and properly disposed of by the Contractor or as directed by the Inspector at no additional cost to SAWS.
 - c. Grading shall be done as may be necessary to prevent surface water from flowing into trenches or other excavations, and any water accumulating therein shall be removed by pumping or by other approved methods.
 - d. Sheet piling and shoring shall be installed in accordance with all applicable safety requirements for the protection of the work, adjoining property, and for the safety of all personnel.
 - e. Unless otherwise indicated, excavation shall be by open cut, hand, backhoe, hoe-ram, rock saw, or other approved method.
 - f. Short sections of a trench may be tunneled, if the pipe or structure can be safely and properly installed or constructed, and backfill can be properly compacted in such tunnel sections.
 - g. Tunneled section must be authorized by SAWS’ Engineer prior to start of Construction.
 - h. Where over-excavation occurs and when not as directed by the Engineer or Inspector, the under-cut trench shall be restored to grade at no cost to SAWS by replacement with a material conforming to the requirements of the bedding material or a material approved by the Engineer.
3. Trenching
- a. Trench walls shall be vertical
 - b. Open trenches are limited to 200 ft. open at one time.
 - c. Contractor shall compact trench and install an all-weather surface on any paved surface, roadway or trench as directed by SAWS’ inspector, prior to proceeding to the next section. Sections are limited to 200 ft. of open trench.
 - d. Projects under 500 ft. must be completely restored at the end of

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each day.

- e. Where the trench bottom has been over excavated in excess both vertically and horizontally, beyond the limits as defined in contract documents, the pipe shall be concrete-encased or encased as directed by the engineer.
 - (1) Encasement shall extend from the trench wall to trench wall and be a minimum of 6 inches above the top of pipe. No separate pay item (See Specification Item No. 858, Concrete Encasement.)
- f. Where the trench bottom is not excavated in accordance with this specification due to rock or other hard under lying materials, then the pipe shall be concrete encased as defined in Specification Item No. 858, Concrete Encasement.
- g. The practice of undercutting at the bottom or flaring at the top will not be permitted except where it is justified for safety or at the Engineer's and/or Inspector's direction.
- h. In special cases, where trench flaring is required, the trench walls shall remain vertical to a depth of at least 1 foot above the top of the pipe.
- i. The trench bottom shall be square or slightly curved to the shape of the trenching machine cutters.
- j. The trench shall be accurately graded along its entire length to provide uniform bearing and support for each section of pipe installed upon the bedding material.
- k. Bell holes and depressions for joints shall be dug after the trench bottom has been graded and bedding installed.
- l. The pipe shall rest upon the new bedding material for its full length.
- m. The minimum allowable base width of the trench shall be not less than 12 inches greater than the exterior diameter of the pipe, not less than 6 inches on each side.
- n. Trench supports are exclusive of the minimum trench width.
- o. The maximum allowable base width of trench shall be not greater than 24 inches than the exterior diameter of the pipe, not more than 12 inches on each side.
- p. Trench supports are exclusive of the maximum trench width.

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- q. Whenever such maximum allowable width of trench is exceeded, except as provided for in the contract documents, or by written approval of the Engineer, the Contractor, at his sole expense, shall encase the pipe in concrete from trench wall to trench wall.
 - r. Any additional trench restoration required as a result of an excavation wider than this maximum width or subsequent surface or paving work, will be done at the Contractor's sole expense.
 - s. When unsuitable bearing materials such as water, silt, muck, trash, debris or rock in ledge, boulder or coarse gravel (particle size larger than 1- 3/4 inch) is encountered at the bearing level, the Contractor shall over- excavate and remove such materials to a depth no less than 6 inches below the bottom of the pipe and replace it with a material conforming to the requirements of this Specification or as approved by the Engineer and/or Inspector.
4. Dewatering: Prevent surface water and subsurface or groundwater from flowing into excavations and from flooding project site and surrounding area.
- a. The Contractor shall not allow water to accumulate in excavations or at subgrade level.
 - b. Remove water to prevent softening of foundation bottoms and soil changes detrimental to stability of subgrades and foundations.
 - c. Provide and maintain dewatering system components necessary to convey water from excavations.
 - d. Convey water removed from excavation and rainwater to collecting or runoff areas away from buildings and other structures.
 - e. Establish and maintain temporary drainage ditches and other diversions outside excavation limits.
 - f. Do not use trench excavations as temporary drainage ditches.
 - g. Dewatering devices shall be provided by the Contractor with filters to prevent the removal of fines from the soil.
 - h. Should the pumping system draw fines from the soil, the Inspector shall order immediate shutdown, and remedial measures will be the responsibility of the Contractor.
 - i. Upon completion of the dewatering work, the Contractor shall remove all equipment and leave the construction area in a neat,

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clean, condition that is acceptable to the Inspector.

- j. The Contractor shall maintain a groundwater table at least 12 inches below the finished excavated trench depth.
 - k. Performances of the dewatering system for lowering groundwater shall be measured by observation wells on piezometers installed in conjunction with the dewatering system, and these shall be documented at least daily.
 - l. The Contractor shall maintain a daily log of these readings and submit them to the Inspector before payment.
 - m. No direct payment shall be made for costs associated with dewatering.
 - n. All costs in connection therewith shall be included in the applicable contract price for the item to which the work pertains.
5. **Backfilling:** Trenches shall not be backfilled until the construction structures or appurtenances, as installed, conform to the requirements specified.
- a. Initial backfill is defined as backfill having a thickness in its compacted state from the surface of the bedding to a point 1 foot above the top of the pipe.
 - b. Initial Bedding material shall be consolidated to assure it is incorporated from the bottom of the trench up to the pipe centerline.
 - (1) A hand-held vibrator, commonly used for concrete work, can be used for this purpose. The vibrator shall be inserted every 3 feet on each side of the pipe.
 - c. For pipelines up to 24 inches in diameter initial backfill material shall be placed in two separate lifts above the bedding material the pipe is set on.
 - (1) The first lift shall be spread uniformly and simultaneously on each side and under the bottom quadrant of the pipe to the mid-point or spring line of the pipe.
 - d. For diameters larger than 24 inches, initial backfill material shall be evenly and simultaneously spread alongside, under the lower quadrant of the pipe and over the pipe in 18 (first lift) or 12 inch lifts to a point sufficient to a minimum of 1 foot above the top of the pipe (See Drawing Series DD-804).

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- e. Placement of the first lift of initial backfill shall be subject to inspection and approval prior to placement of second lift, which shall extend from the spring line of the pipe to a minimum of 1 foot above the top of the pipe.
- f. Secondary backfill is defined as backfill from 1 foot above the top of the pipe to the top of the trench or bottom of pavement section.
- g. Secondary backfill shall generally consist of materials removed from the trench and shall be free of brush, debris and trash.
 - (1) Rock or stones having a dimension larger than 6 inches at the largest dimension shall be sifted out and removed before the material is used in the secondary backfilling zone.
 - (2) Secondary backfill material shall be primarily composed of compactible soil materials. The secondary backfill material shall be placed in maximum 12 inch loose lifts or as directed by the Engineer and/or Inspector.
- h. Secondary backfill shall be constructed in accordance with details shown in the construction documents.
- i. All compaction within the secondary backfill zone shall be such that the relative dry density of each layer shall be not less than 98% compaction from the top of the initial backfill to the bottom of pavement section as outlined in TxDOT Testing Methods Tex-113 or Tex-114.
- j. For native sand backfill and non-cohesive soils, Engineer will specify compaction requirements.
- k. The second lift shall be evenly spread in a similar manner as the first lift.
- l. Where specified, by Engineer, only the secondary backfilling may incorporate native excavated materials approved, by Engineer, for backfilling, consisting of earth, loam, sandy clay, sand and gravel, soft shale or other approved materials, free from large clods of earth or stones.
- m. Where pipe is specially coated or sleeve/tape wrapped for protection against corrosion, care shall be taken not to damage the coating or sleeve/tape wrap.
- n. Damaged wrap will be replaced at Contractor's expense.
- o. Where a trench has been improperly backfilled, or where settlement occurs, the identified section shall be excavated to the trench depth and a length 50 feet in both directions of the failed

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- area, then refilled and compacted to the grade and compaction level required at the Contractor's expense.
- p. The use of sand backfill shall not be allowed, except as secondary backfill if the native soil is sand. Compaction and moisture-density relationship to be determined by TxDOT Testing Methods Tex-113 or Tex-114.
 - q. Soil Characteristic determined by TxDOT-142e.
 - r. The pavement (asphalt) section shall have 95% compaction density with a maximum dry density at + or - 1% optimum moisture content as determined by tests on samples as outlined in the latest provisions of TX-DOT Testing Method Tex 113-E or Tex-114, unless otherwise shown on the contract documents.
 - s. At the time of compaction, the water content shall be at optimum moisture content, + or - 1% points as outlined in the latest provisions of TX-DOT Testing Method Tex 113-E or Tex-114.
6. Trench Surface Restoration: The surface of the backfilled trench shall be restored to match the previous existing conditions.
- a. This shall include final grading, placement of topsoil and seeding, placement of sod (such as at homes or businesses that had maintained grass), or other unprepared and prepared surfaces.
 - b. Contractor shall compact trench and install an all-weather surface on any paved surface, roadway or trench as directed by SAWS inspector, prior to proceeding to next section. Sections limited to 200 ft. of open trench.
 - c. Trenches in alleys actively being used by vehicles (such as trash pickup, vehicle parking, etc.) shall be restored by grading and compacting to 98% (per TxDOT Tex-113 or Tex - 114) or higher with a minimum of 4 inches of flex- base materials for the entire width of the alley.
 - d. Asphaltic materials shall have a compaction density of 95%.
 - e. Alleys not actively used by vehicles shall be graded and compacted to 98% (per TxDOT Tex-113 or Tex - 114) or higher from the top of the initial backfill to the bottom of the pavement section, then spread grass seed for entire width of the alley.
 - f. Trenches in paved streets shall be covered with a temporary all-weather surface to allow for vehicular traffic and protect trench from weather, water infiltration and runoff until the final

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asphalt/concrete paving is complete.

- (1) This surface shall be a minimum of 4 inches hot-mix cold lay compacted and rolled asphaltic black base, either hot-mix or cold-mix applied, or plates with cold mix asphalt installed around the edges.
 - (2) It is the Contractor's responsibility to maintain this surface until the final street restoration is complete.
 - (3) Sections limited to 200 ft. of open trench at a time.
 - (4) Temporary street striping may also be required.
 - (5) This surface must be removed prior to final asphaltting.
- g. All street work shall be done in accordance with the latest City of San Antonio Public Works' (or other city as applicable) construction specifications.
- h. Included in this requirement is replacement of any curbs or sidewalks damaged or removed during the construction.
- i. No separate payment for the surface restoration is permitted. The cost for this work must be included in the appropriate bid item.

804.6 DISPOSAL OF EXCAVATED MATERIALS: Any excess excavated material, not utilized after all fill requirements have been met, shall become the responsibility of the Contractor.

1. The Contractor shall dispose of it by hauling and wasting outside the limits of the rights-of-way or easements of this project and of public thoroughfares and water courses, in conformity with pertinent City, County, State and Federal codes and ordinances and in a manner meeting the approval of the Engineer or Inspector.

804.7 QUALITY CONTROL:

1. All testing to be coordinated 48 hours in advance with SAWS Inspector.
2. Samples to be taken in conjunction with SAWS samples at same time and location.
3. Contractor to be prepared to test if coordinated with Inspector.
4. Quality Assurance Testing: The Owner shall have such tests and inspections as he may desire performed by a nationally-accredited,

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independent testing laboratory for his guidance and control of the work.

- a. The Owner will determine in-place density and moisture content by anyone or combination of the following methods:
 - (1) TxDOT Tex-113-E - Laboratory Compaction Characteristics and Moisture-Density Relationship of Base Materials
 - (2) TxDOT Tex-114 -E- Laboratory Compaction Characteristics and Moisture-Density Relationship of Subgrade, Embankment Soils, and Backfill Material
 - (3) ASTM D2922 (density of soil and soil aggregate in-place by nuclear methods – shallow depth),
 - (4) ASTM D1556 (density and unit weight of soil in-place by sand cone method),
 - (5) ASTM D2216 (lab density of water content of soil and rock),
 - (6) ASTM D3017 (water content of soil and rock – shallow depth in-place by nuclear methods) or most applicable approved equal provisions.
- b. Payment for such tests shall be the responsibility of the Owner, including the material proctor tests and density tests.
- c. The Contractor shall request testing work performed by the Owner by notifying the Owner of the areas available by Station Numbers or Dimensions and Lift Numbers.
- d. The Contractor shall provide access to SAWS and to lab to the test area, backfilling test areas and provide associated trench excavation safety protection at the Contractor's expense for all depths and lifts.
- e. The frequency and location of testing shall be determined solely by the SAWS. Or at a minimum tests will be done at location points randomly selected as indicated by the Inspector/Test Administrator, per each 18 (first lift from bottom) and 12 inch loose lift per 100 linear feet, at a probe depth of six (6) inches. One per lift per 100 ft.
- f. The Owner may test any lift of fill at any time, location, or elevation.

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5. Quality Control Testing: The Contractor shall be responsible for compaction in accordance with the appropriate Specification.
 - a. Compaction tests will be done at location points randomly selected or as indicated by the SAWS' Inspector/Test Administrator, per each 18 (first lift from bottom) and 12 inch loose lift per 100 linear feet, at a probe depth of six (6) inches. One per lift per 100 ft.
 - b. The inspector shall determine the depth at which the density test shall be taken.
 - c. All depths shall be considered for testing without a predetermined maximum or minimum
 - d. Test requirements above are indicated as a minimum requirement, but maybe subjected to follow more stringent requirements as established by other appropriate agencies (such as COSA Public Works Right of Way Management Plan, etc.)
 - e. Any failed test shall require the Contractor to remove and replace that layer of backfill in the identified section of the failed test location to the trench depth and a length 50 feet in both directions, then refilled and compacted to the grade and compaction level required.
 - 1) The Contractor will also be required at no cost to SAWS to provide two additional tests at the replaced location where the initial test failed and at one location point, randomly selected or as indicated by the SAWS Inspector/Test Administrator.
 - f. Sanitary Sewer Laterals will be subject to compaction tests at the discretion of the SAWS' Inspector/Test Administrator within 100 linear foot segments.
 - 1) Any failed test shall require the Contractor to remove and replace that layer of backfill in the identified section of the failed test location to the trench depth and a length 50 feet in both directions, then refilled and compacted to the grade and compaction level required.
 - 2) The Contractor will also be required at no cost to SAWS to provide two additional tests at the replaced location where the initial test failed and at one location point, randomly selected or as indicated by the SAWS' Inspector/Test Administrator.

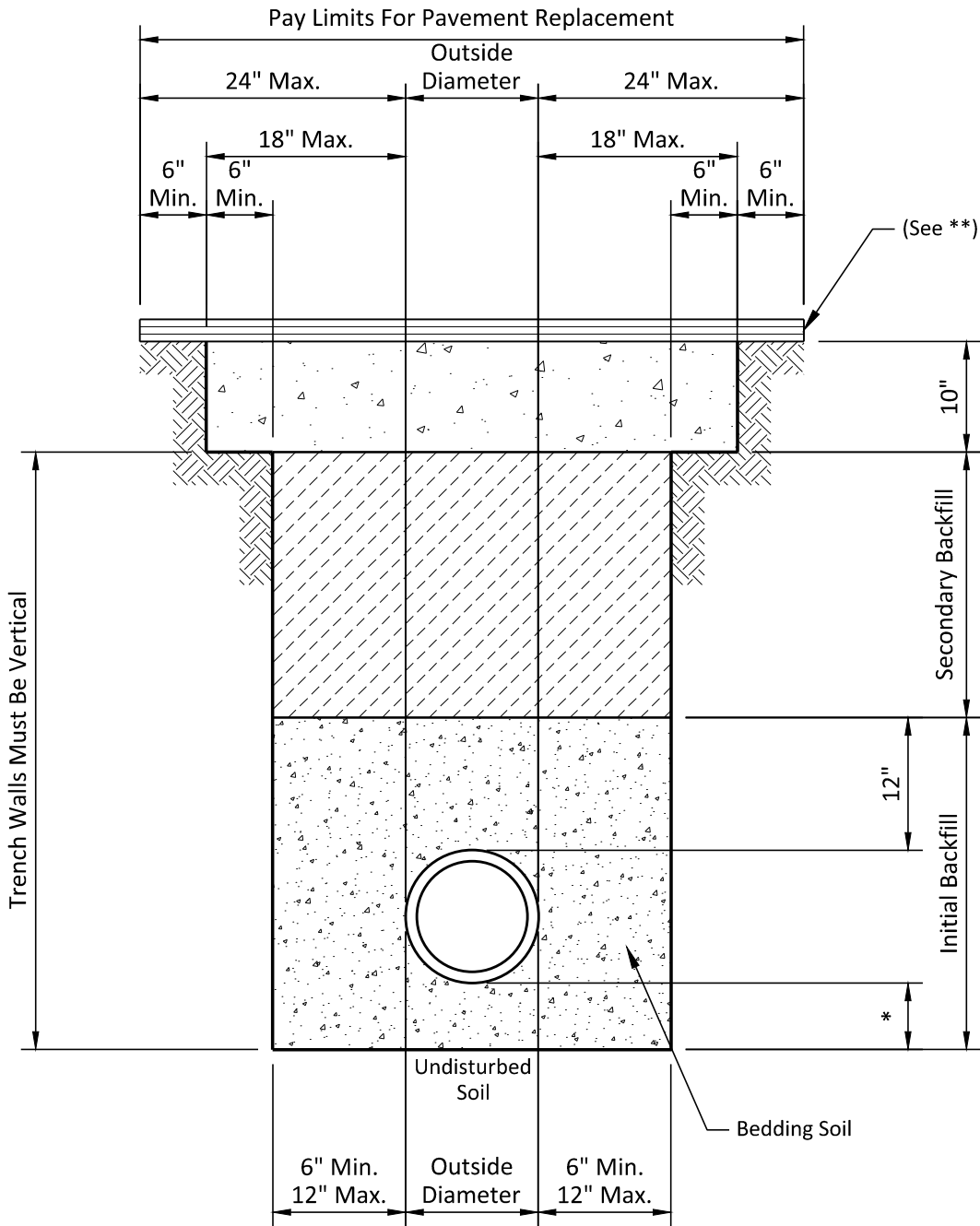
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- g. The Contractor shall be responsible for all costs associated with the proctor and density tests, and for providing to SAWS and Consultant, if applicable, verification that necessary compaction levels were achieved.
- h. These tests shall be performed by a nationally-accredited, independent testing laboratory.
- i. The Contractor shall provide access to SAWS and to lab to the test area, backfilling test areas and provide associated trench excavation safety protection at the Contractor's expense for all depths and lifts.

804.8 MEASUREMENT: Excavation, Trenching and Backfill will not be measured for payment

804.9 PAYMENT: No direct payment shall be made for incidental costs associated with quality control testing, excavation, trenching backfilling for water mains and sanitary sewers, and placement of all-weather material and all costs in connection therewith shall be included in the applicable contract price for the item to which the work pertains.

-End of Specification-



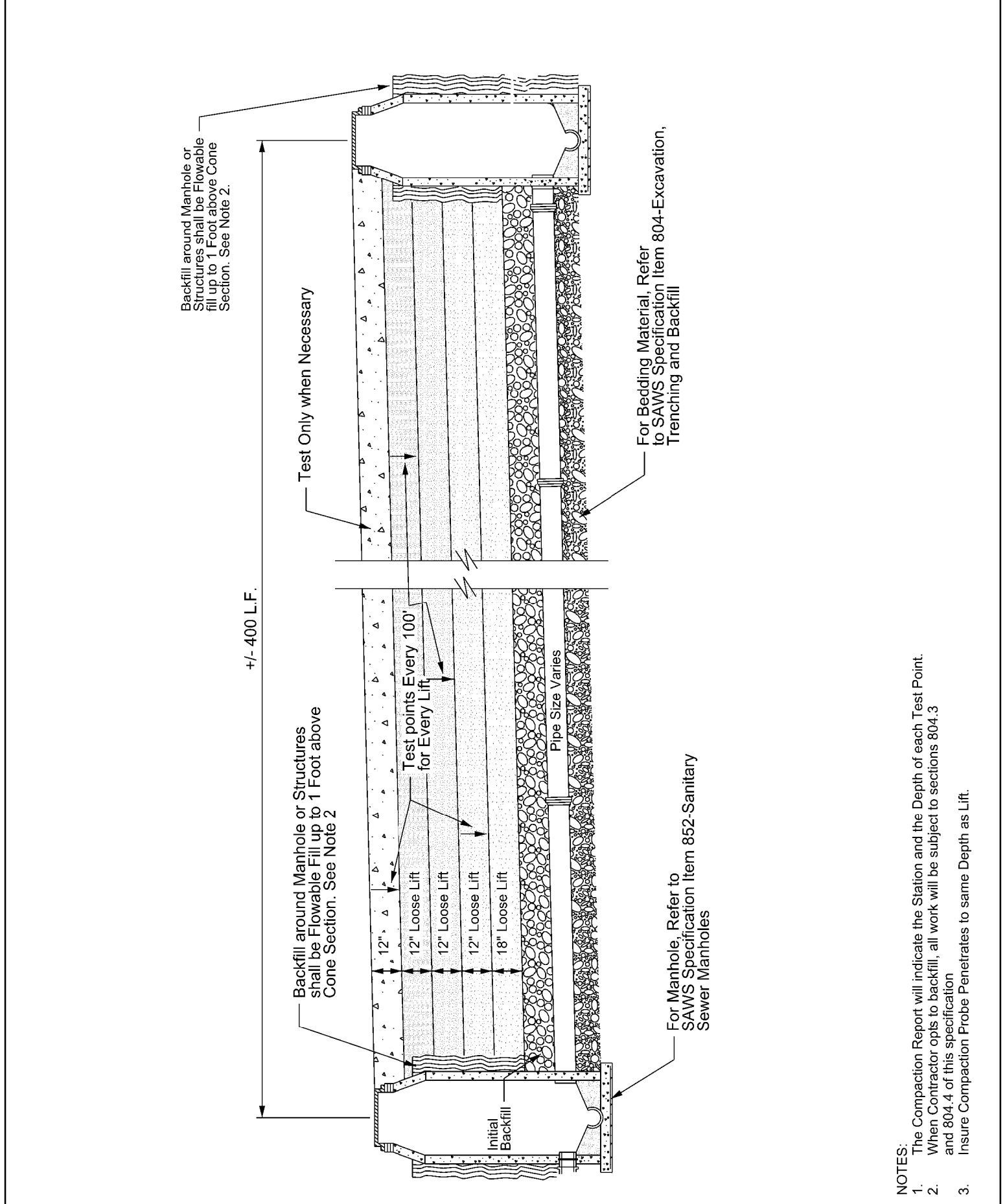
The Existing Material at the Bearing Level shall be Removed and Replaced to a Minimum Depth of 6-Inches or $\frac{1}{8}$ of the Outside Diameter of the Pipe, whichever is greater, with Bedding Material.

In Areas of over Excavation, Encasement shall extend from Trench Wall. Pay Limits shall not Exceed 12" Max. as shown on Detail. Additional Encasement shall be incidental.

- * Sewer Gravel 6" Min. or $\frac{1}{8}$ O.D. of the Pipe, whichever is greater.
- ** Minimum 2" HMAC Type "D" for Trench Repair in Local/Residential Streets.
- ** Minimum 3" HMAC Type "C" for Trench Repair in Collector/Arterial Streets.

- Hot Mix Asphalt Concrete (HMAC)
- Asphalt Treated Base (A.T.B.)

| | | | |
|--|--|------------------|----------|
| PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS | SANITARY SEWER PIPE LAID IN TRENCH | APPROVED | REVISED |
| | | MARCH 2008 | AUG 2019 |
| | | DD-804-01 | |



- NOTES:
1. The Compaction Report will indicate the Station and the Depth of each Test Point.
 2. When Contractor opts to backfill, all work will be subject to sections 804.3 and 804.4 of this specification
 3. Insure Compaction Probe Penetrates to same Depth as Lift.

PROPERTY OF
SAN ANTONIO WATER SYSTEM
 SAN ANTONIO, TEXAS

TRENCH COMPACTION
 DETAIL

APPROVED
 MARCH 2018

REVISED
 AUG 2019

DD 804-02

SHEET
1 OF 1

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ITEM NO. 848

Sanitary Sewers

848.1 DESCRIPTION: This item shall govern the furnishing, installation, adjustment, or replacement of sanitary sewer pipe of the size and type specified in the contract documents.

848.2 REFERENCED STANDARDS: Reference standards cited in this Specification Item No. 848 refer to the current reference standard published at the time of the latest revision date.

1. San Antonio Water System (SAWS):
 - a. Specifications for Water and Sanitary Sewer Construction
 - b. SAWS Materials Specifications
2. City of San Antonio (COSA) Specifications for Construction
3. Texas Commission of Environmental Quality (TCEQ)
 - a. Chapter 217 Design Criteria for Domestic Wastewater Systems
 - b. Chapter 213 (“Edwards Aquifer”)
4. American Society for Testing and Materials (ASTM)
 - a. ASTM C 150 - Standard Specification for Portland Cement.
 - b. ASTM C 494 - Standard Specification for Chemical Admixture for Concrete.
 - c. ASTM C 618 - Standard Specification for Fly Ash and Raw or Calcinated Natural Pozzolan for use as Mineral Admixture in Portland Cement Concrete.
 - d. ASTM C 937 - Standard Specification for Grout Fluidifier for Pre-placed Aggregate Concrete.
 - e. ASTM C 940 - Standard Test Method for Expansion and Bleeding of Freshly Mixed Grout for Replaced Aggregate Concrete in the Laboratory.
 - f. ASTM C 1017 - Standard Specification for Chemical Admixture for Use in Producing Flowing Concrete.
 - g. ASTM C 1107 - Specification for Packaged Dry, Hydraulic-Cement Grout (Non-shrink)
 - h. A. ASTM D 618 - Standard Practice for Conditioning Plastics for Testing.
 - i. ASTM D 1248 - Standard Specification for Polyethylene Plastics Molding and Extrusion Materials.
 - j. ASTM D 1784 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
 - k. ASTM D 2122 – Standard Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings.
 - l. ASTM D 2241 - Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series).

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- m. ASTM D 2310 - Standard Classification for Machine-Made Fiberglass (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe
- n. ASTM D 2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
- o. ASTM 2412 – Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel Plate Loading
- p. ASTM D 2444 - Standard Test Method for Determination of the Impact Resistance of Thermoplastic Pipe and Fittings by Means of a Tup (Falling Weight).
- q. ASTM D 2657 - Standard Practice for Heat Fusion Joining Polyolefin Pipe and Fittings.
- r. ASTM D 2680 - Specification for Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Composite Sewer Piping.
- s. ASTM D 2837 - Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials.
- t. ASTM D 2992 - Obtaining Hydrostatic or Pressure Design Basis for "Fiberglass" (Glass-Fiber-Reinforced-Thermosetting) Resin Pipe and Fittings.
- u. ASTM D 3034 - Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- v. ASTM D 3035 - Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter.
- w. ASTM D 3139 - Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.
- x. ASTM D 3212 - Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.
- y. ASTM D 3262 - Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer Pipe.
- z. ASTM D 3350 - Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.
- aa. ASTM D 3681 - Method for Determining Chemical Resistance of "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe in a Deflected Condition.
- bb. ASTM D 3754 - Standard Specification for "Fiberglass" (Glass-Fiber Reinforced Thermosetting-Resin) Sewer and Industrial Pressure Pipe.
- cc. ASTM D 4161 - Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe Joints Using Flexible Elastomeric Seals.
- dd. ASTM F 477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
- ee. ASTM F 679 - Standard Specification for Poly (Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings.
- ff. ASTM F 714 - Standard Specification for Polyethylene Plastic (PE) Pipe (SDR-PR) Based on Outside Diameter.

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- gg. ASTM F 794 - Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter.
 - hh. ASTM F 894 - Standard Specification for Polyethylene (PE) Large-Diameter Profile Wall Sewer and Drain Pipe.
 - ii. ASTM G 62 - Standard Test Methods for Holiday Detection in Pipeline Coatings.
5. American Water Works Association (AWWA)
- a. AWWA C 110 - American National Standard for Ductile-Iron and Gray-Iron Fittings, 3 Inches Through 48 Inches for Water.
 - b. AWWA C 111 - American National Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
 - c. AWWA C 900 - Standard for Polyvinyl Chloride (PVC) Pressure Pipe, 4 Inches Through 12 Inches for Water Distribution.
 - d. AWWA C 909 - Standard for Molecularly-Oriented Polyvinyl Chloride (PVCO) Pressure Pipe, 4 Inches through 12 Inches (100mm through 300 mm), for Water Distribution.
 - e. AWWA M23 – PVC Pipe – Design and Installation
 - f. W. PPI TR3 - Policies and Procedures for Developing Recommended Hydrostatic Design Stresses for Thermoplastic Pipe Materials.
 - g. AWWA C 300 - Standard for Prestressed Concrete Pressure Pipe, Steel-Cylinder Type, for Water and other Liquids.
 - h. AWWA C 950 – Fiberglass Pressure Pipe
 - i. AWWA M 45 – Fiberglass Pipe Design
7. National Science Foundation
- a. NSF Standard 61 - Drinking Water System Components - Health Effects.
8. Society of Protective Coatings
- a. SSPC-SP 6 - Steel Structures Painting Council, Commercial Blast Cleaning.
9. Uni-Bell
- a. UNI-B-13 - Recommended Standard Performance Specification for Joint Restraint Devices for Use with Polyvinyl Chloride Pipe.

848.3 SUBMITTALS: Contractor shall submit manufacturer's product data, instructions, recommendations, shop drawings, and certifications.

1. Contractor to submit cut sheets prior to commencement of open cut work.
2. Submit proposed methods, equipment, materials and sequence of operations for sewer construction.
3. Plan operations so as to minimize disruption of utilities to occupied facilities or adjacent property.
4. Submit all test reports and pre and post sewer television inspection video.
5. Videos become property of SAWS.

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848.4 MATERIALS: Materials for sanitary sewer pipe and fittings shall be either rigid or flexible. All pipe not listed shall be subject to pre-approval by the Engineer.

1. Rigid Pipe:
 - a. Concrete Pipe: Concrete pipe shall not be used.
 - b. Concrete Steel Cylinder Pipe: Concrete Steel Cylinder Pipe shall not be used.
 - c. Asbestos-Cement (AC) Pipe: AC pipe shall not be used. Refer to Specification Item No. 3000, "Handling Asbestos Cement Pipe."
2. Flexible Pipe: Pipe consisting of materials other than those listed above.
 - a. Any flexible pipe having a deflection of the inside diameter greater than 5% after 30 days of installation will not be accepted.
 - b. Testing shall be as per SAWS Test Specification Item No. 849 - Sanitary Sewer Testing
 - c. Working room for flexible pipe shall be as per Specification Item No. 804 Excavation Trenching and Backfill.
 - d. Polyvinylchloride (PVC) Sewer Pipe: Pipe shall be made from class 12454 materials as described in ASTM D1784.
 - i. For pipes 4 inches to 15 inches in diameter, fittings and joints shall conform to ASTM D3034 and D3212, with the exception that solvent cement joints shall not be used.
 - ii. All pipes that are 18 inches to 24 inches in diameter shall meet the requirements of ASTM F679.
 - iii. **All sanitary sewer PVC pipe shall be green. White pipe is prohibited. Contractor will need to submit information to request an exemption to use white pipe such as letters from suppliers that pipe is not available. Once a project is awarded Contractor should bring this exemption to SAWS attention via RFI. If white pipe is approved it must have appropriate markings and be wrapped with green poly wrap. This shall include all lateral piping as well.**
 - iv. At waterline crossings and where water and sewer mains are parallel and separation distance cannot be achieved as per 30 TAC 217.53, use extra stiff pipe SDR 26 PVC (ASTM D2241) with a minimum pressure rating of 160 psi.
 - e. Fiberglass Reinforced Sewer Pipe, Non-Pressure Type:
 - i. Fiberglass reinforced sewer pipe, non-pressure type, shall be a factory-formed conduit of polyester resin, fiberglass and silica sand built up in laminates and shall conform to the requirements of ASTM D3262, including the appendix and subsequent specifications, and in accordance with SAWS' material specifications.
 - ii. Depths shall comply with requirement of ASTM D3839.
 - iii. Joints for pipe and fittings shall be confined compression rubber gasket bell and spigot type joints conforming to the material and performance requirements of ASTM D4161. Depths shall comply with requirement of ASTM D3681.

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- iv. Flanges, elbows, reducers, tees, wyes, laterals, and other fittings shall be capable of withstanding all operating conditions when installed. They may be contact molded or manufactured from mitered sections of pipe joined by glass-fiber reinforced overlays.
- v. For pipe diameters 15 inches or larger, lateral openings 6 inch or greater in size shall be made using PVC sewer saddles conforming to ASTM D2661 or insert a tee connection conforming to ASTM D3034, approved by the Engineer, and found in SAWS' Material Specifications.
- vi. Minimum pipe stiffness shall not be less than SN 72 for direct bury applications
- f. High density, High Molecular Weight Polyethylene Pipe (HDPE):
 - i. HDPE shall meet requirements of Type III, Class C, Category 5, Grade P34, as defined in ASTM D 1248.
 - ii. Material meeting requirements of cell classification 345434D or E, in accordance with ASTM D 3350, are also suitable for making pipe products under these specifications.
 - iii. Inner wall of pipe shall be of light or gray color for television inspection purposes.
- 3. Pressure Pipe/Force Mains:
 - a. High density, High Molecular Weight Polyethylene Pipe (HDPE):
 - i. HDPE shall meet requirements of Type III, Class C, Category 5, Grade P34, as defined in ASTM D 1248.
 - ii. Material meeting requirements of cell classification 345434D or E, in accordance with ASTM D 3350, are also suitable for making pipe products under these specifications.
 - iii. Inner wall of pipe shall be of light or gray color for television inspection purposes.
 - b. The pressure rating, size, and pressure class shall be as shown in the contract documents.
 - c. All required joint restraint shall be approved by the Engineer prior to the work being accepted.
 - d. Pressure pipe/Force mains are required to have modified grade 5 material used as bedding.
 - e. Pipes also shall be hydrostatically tested at a minimum of 150 psi after their construction to ensure proper construction.
- 4. Mechanical or compression joints, concrete jointing collars, or non-reinforced rubber adaptors shall be used only as approved by the Engineer.
- 5. All sanitary sewer pipe and fittings utilized within the jurisdiction of SAWS shall be tested by a manufacturer-approved laboratory at the source of supply.
- 6. All shipments of pipe shall be accompanied by a certificate of compliance to these specifications prepared by an independent testing laboratory and signed by a Texas registered professional engineer.

848.5 CONSTRUCTION: All sanitary sewer mains shall be constructed in accordance with the specifications herein outlined and in conformity with the required lines, grades, and details

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shown in the contract documents and as directed by the Engineer. Whenever true line and grade is not attained it will be the Contractor's sole responsibility to remove and reinstall any and all sewer pipe deemed required by the Engineer and shall be done at the Contractor's expense.

1. Successful passage of the Hydrostatic, air test and mandrel test (for flexible pipe, 30 days after installation), as described under TCEQ criteria. In addition sewer pipe must also pass settlement test for the final acceptance of the mains. Settlement Testing shall be performed in accordance with Specification Item No. 849 "Sanitary Sewer Testing".
2. Mains shall be properly backfilled as per Specification Item No. 804, "Excavation Trenching and Backfill" prior to the start of the 30 day testing period.
3. Water Main Crossings: Where gravity or force main sewers are constructed in the vicinity of water mains, the requirements of the 30 TAC§ 217.53 shall be met.
4. For excavation, trenching and backfill requirements see Specification Item No. 804, "Excavation, Trenching and Backfill."
5. Pipe Installation: The Inspector will inspect all pipe before it is placed in the trench and will reject any sections found to be damaged or defective to a degree that would affect the structural integrity of the pipe.
6. Rejected pipe shall be immediately removed from the site of the work and replaced with new acceptable pipe.
7. Sewer main installation should be constructed from downstream to upstream as standard practice.
8. No pipe shall be laid within 10 feet of any point where excavation is in progress. Pipe installation shall proceed upgrade with the bell pointing in the upstream direction of flow.
9. Pipe shall be lowered into the trench without disturbing the prepared bedding or the trench sides.
10. The drilling of lifting holes in the field will not be permitted.
11. Pipe shall be installed by means of a concentric pressure being applied to the pipe with a mechanical pipe puller. Pulling or pushing a joint of pipe in place by using a crane, bulldozer, or backhoe will not be permitted.
12. Pipe shall be "pulled home" in a straight line with all parts of the pipe on line and grade at all times.
13. No side movement or up and down movement of the pipe will be permitted during or after the pulling operation.
14. Should coupled joints of pipe be out of line or off grade, they shall be removed one joint at a time in the presence of the Inspector and brought to the proper line and grade.
15. The lifting or moving of several joints of coupled pipe at one time to close a partially open joint or to fine grade under laid joints of pipe will not be permitted.
16. Contractor shall insure that all existing or proposed manholes or structures shall remain visible and accessible at all times.
17. No manhole or structure covers shall be covered by pavement, equipment, or other obstructions other than a removable, steel plate (min thickness of ½ inch and H-20 traffic bearing rated), temporary lid provided for safety.

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18. Pipe Separation: Sewer pipe separation distances shall be maintained in accordance with TCEQ rules 30 §217.53. See Drawing Series DD-848.
19. Contractor to obtain the services of a licensed surveyor in accordance with the General Conditions for the purpose of validating the elevations of all sewer main work including the installation of manholes. It is the contractor responsibility to use the latest technology including Laser Beams to establish elevations as per design plans.
 - a. Contractor to provide SAWS with the licensed surveyors report validating the all pipe was installed per design plans and upload report in CPMS.
 - b. If the sewer main or manholes are not constructed per plans it is the contractors responsibility to relay or replace any sewer work at his cost with no additional days granted.
20. **No horizontal or vertical curves shall be permitted in conformance with appropriate regulatory agency requirements.**
21. Before leaving the work unattended, the upper ends of all pipelines shall be securely closed with a tight fitting plug or closure.
22. The interior of laid pipe shall be kept free from dirt, silt, gravel, or foreign material at all times.
23. All pipes in place must be approved by the Inspector before backfilling.
24. When replacing an existing system in place, Contractor shall maintain screens to prevent the entrance of construction debris into the sewer system.
25. Pipe bursting on AC sanitary sewer pipe is not allowed.

848.6 MEASUREMENT: All sewer pipes will be measured from center of manhole to center of manhole or end of main.

1. Measurement will be continuous through any fittings in the main, even though the fittings are pay items of the contract.

848.7 PAYMENT: Sewer pipe up to 24-inches will be paid for at the contract bid price per linear foot. Sewer pipe larger than 24-inches will be paid for by percentage listed below.

1. For sewer pipe up to 24-inches said price shall be full compensation for furnishing all materials, including pipe, couplings, trenching, pumping, concrete, plugs, laying and jointing, backfilling, select bedding and initial backfill material, tamping, water, labor, tools, equipment, and all weather surface, testing, acceptable densities and must meet all requirement for testing and other incidentals necessary to complete the work.
2. For sewer pipe over 24-inches the contractor will get paid 80% of the bid item cost for furnishing all materials, including pipe, couplings, trenching, pumping, concrete, plugs, laying and jointing, backfilling, select bedding and initial backfill material, tamping, water, labor, tools, equipment, and all weather surface.
3. For sewer pipe over 24-inches the contractor will get paid the remaining 20% percent of the bid item cost for the approved testing results of acceptable densities

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and must meet all requirement for all other testing and other incidentals necessary to complete the work.

4. When the minimum separation distances for any water and sewer piping facilities cannot be maintained per 30 TAC §217.53, Contractor shall install SDR-26 PVC pipe (160 psi pressure rated). Payment for this higher pressure rated pipe shall be made the contract bid price per linear foot complete in place for the type, and size constructed as described above.
5. Sewer pipe fittings, as part of the main line such as wyes and tees, are inclusive in the cost of Specification Item No.854, "Sanitary Sewer Laterals."
6. Pay cuts will be measured from the top of ground prior to the Contractor's operation and along the centerline of the pipe to the invert of the pipe, to be submitted with cut sheets.

-End of Specification-

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ITEM NO. 849

Sanitary Sewer Testing

849.1 DESCRIPTION: This item shall consist of air, infiltration/exfiltration, pipe deflection, and settlement tests in accordance with this specification and as directed by the Engineer.

849.2 REFERENCED STANDARDS: Reference standards cited in this Specification Item No. 849 refer to the current reference standard published at the time of the latest revision date.

1. San Antonio Water System (SAWS)
 - a. Specifications for Water and Sanitary Sewer Construction
 - b. SAWS Materials Specifications
2. City of San Antonio (COSA) Standard Specification for Construction
3. Texas Commission of Environmental Quality (TCEQ)
 - a. 217 Design Criteria for Domestic Wastewater Systems
4. American Society for Testing and Materials (ASTM) International:
 - a. ASTM C 828 – Standard Test Method for Low Pressure Air Test of Vitrified Clay Pipe Lines.
 - b. ASTM C 924 – Standard Practice for Testing Concrete Pipe Sewer Lines by Low-Pressure Air Test Method.
 - c. ASTM D 3034 – Standard Specification for Type PSM Polyethylene (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
 - d. ASTM F 794 – Specification for Poly (Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter.
 - e. ASTM F 1417 – Standard Test Method for Installation Acceptance of Plastic Gravity Sewer Lines Using Low Pressure Air.
 - f. ASTM C 1244 Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill.

849.3 SUBMITTALS: Contractor shall submit manufacturer's product data instructions, recommendations, shop drawings, and certifications.

1. Test Plan: Before testing begins and in adequate time to obtain approval through submittal process, prepare, and submit test plan for approval by Engineer.
2. Include testing procedures, methods, equipment, and tentative schedule. Obtain advance written approval for deviations from Drawings and Specifications.
3. Submit test reports for each test on each segment of sanitary sewer.

849.4 MATERIALS: The materials installed for air and deflection tests shall conform to the appropriate specifications contained within the latest revision of SAWS' Material Specifications.

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849.5 TESTING OF INSTALLED PIPE: The Contractor shall perform a low-pressure air test or an infiltration/exfiltration test, and, for pipe installed by open cut method, a settlement test before the installed work shall be considered accepted. If a gravity collection main is composed of flexible pipe, a deflection test will also be required. Flexible pipe is defined as pipe that will deflect at least 2% without structural distress. Contractor shall insure that all testing is performed in the presence of the Inspector, with copies of all written test results made available to the Inspector. Tests shall conform to the following requirements:

1. Low-Pressure Air Test: The procedure for the low-pressure air test shall conform to the procedures described in ASTM C828, ASTM C924, and ASTM F1417 (or other appropriate procedures), except for testing times. The test times shall be as outlined in this section. For sections of pipe less than 36-inch average inside diameter, the following procedure shall apply. The pipe shall be pressurized to 3.5 psi greater than the pressure exerted by groundwater above the pipe. Once the pressure is stabilized, the minimum time allowable for the pressure to drop from 3.5 pounds per square inch gauge to 2.5 pounds per square inch gauge shall be computed from the following equation:

$$T = \frac{0.085 \times D \times K}{Q}$$

T = Time for pressure to drop 1.0 pound per square inch gauge in seconds;

K = $0.000419 \times D \times L$, but not less than 1.0;

D = Average inside pipe diameter, in inches;

L = Length of line of same pipe size being tested, in feet;

Q = Rate of loss, 0.0015 cubic feet per minute per square foot internal surface shall be used since a K value of less than 1.0 shall not be used.

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The minimum testing times for each pipe diameter is as follows:

| Pipe Diameter | Minimum Time | Length for Minimum Time | Time for Longer Length |
|----------------------|---------------------|--------------------------------|-------------------------------|
| Inches | Seconds | Feet | Seconds/Ft |
| 6 | 340 | 398 | 0.855 |
| 8 | 454 | 298 | 1.520 |
| 10 | 567 | 239 | 2.374 |
| 12 | 680 | 199 | 3.419 |
| 15 | 850 | 159 | 5.342 |
| 18 | 1,020 | 133 | 7.693 |
| 21 | 1,190 | 114 | 10.471 |
| 24 | 1,360 | 100 | 13.676 |
| 27 | 1,530 | 88 | 17.309 |
| 30 | 1,700 | 80 | 21.369 |
| 33 | 1,870 | 72 | 25.856 |

* Note: Test time starts after the required 60 seconds of stabilization time has transpired.

The test may be stopped if no pressure loss has occurred during the first 25% of the calculated testing time. If any pressure loss or leakage has occurred during the first 25% of the testing period, then the test shall continue for the entire test duration as outlined above or until failure.

Mains with a 27-inch or larger average inside diameter may be air tested at each joint instead of air testing entire pipe.

Mains with a 36-inch average inside diameter and larger must be air tested at each joint. If the joint test is used, a visual inspection of the joint shall be performed immediately after testing. The pipe is to be pressurized to 3.5 psi greater than the pressure exerted by groundwater above the pipe. Once the pressure has stabilized, the minimum time allowable for the pressure to drop from 3.5 pounds per square inch gauge to 2.5 pounds per square inch gauge shall be 10 seconds.

2. Infiltration/Exfiltration Test: The total exfiltration, as determined by a hydrostatic head test, must not exceed 10 gallons per inch of diameter per mile of main per 24 hours, at a minimum test head of 2 feet above the crown of the main at an upstream manhole. The Contractor shall use an infiltration test in lieu of an exfiltration test

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when mains are installed below the ground water level. In such cases, the total exfiltration, as determined by a hydrostatic head test, must not exceed 10 gallons per inch diameter per mile of main 24 hours at a minimum test head of 2 feet above the crown of the main at an upstream manhole, or at least 2 feet above the existing groundwater level, whichever is greater. For construction work occurring within a 25-year floodplain, the infiltration or exfiltration must not exceed 10 gallons per inch diameter per mile of main per 24 hours at the same minimum test head as stated in the previous sentence. If the quantity of infiltration or exfiltration exceeds the maximum quantity specified, the Contractor shall propose to the Engineer, and receive approval therefrom, all necessary remedial action, solely at the Contractor's own cost, in order to reduce the infiltration or exfiltration to an amount within the limits specified herein.

3. Deflection Testing: As stated in the 30 TAC § 217, deflection test shall be performed on all flexible pipe installed.
 - a. For mains with inside diameters less than 36 inches, a rigid mandrel shall be used to measure deflection.
 - b. For mains with an inside diameter 36 inches and greater, a method approved by the Engineer shall be used to test for vertical deflections.
 - c. For rigid pipe, a manufacturer approved "Go, No Go" deflection rod may be used to test deflection, but must be approved by Engineer or Inspector prior to testing.
 - d. The deflection test must be accurate to within $\pm 0.2\%$ deflection. The test shall be conducted after the final backfill has been in place at least 30 days. No pipe shall exceed a deflection of five percent. If a pipe should fail to pass the deflection test, the problem shall be corrected, and a second test shall be conducted after the failed area's final backfill has been in place an additional 30 days. The tests shall be performed without mechanical pulling devices. The Engineer should recognize that this is a maximum deflection criterion for all pipes and a deflection test less than 5 % may be more appropriate for specific types and sizes of pipe. Upon completion of construction, the Engineer or other Texas Registered Professional Engineer appointed by the owner shall certify to the Inspector, that the entire installation has passed the deflection test. This certification may be made in conjunction with the notice of completion required in 30 TAC § 217.14. (1) of this title (relating to General Provisions). This certification shall be provided for the Owner to consider the requirements of the approval have been met.
 - e. Contractor shall provide 24 hr. notice to Engineer and Inspector prior to any testing.
 - f. Engineer of Record must witness all tests over the EARZ.
 - g. Mandrel Sizing. The rigid mandrel shall have an outside diameter (O.D.) not less than 95% of the inside diameter (I.D.) of the pipe.
 - h. The inside diameter of the pipe, for the purpose of determining the outside

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diameter of the mandrel, shall be the average outside diameter minus two minimum wall thicknesses for O.D. controlled pipe and the average inside diameter for I.D. controlled pipe. All dimensions shall be per appropriate standard. Statistical or other "tolerance packages" shall not be considered in mandrel sizing.

- i. Mandrel Design: The rigid mandrel shall be constructed of a metal or a rigid plastic material that can withstand 200 psi without being deformed.
 - ii. The mandrel shall have nine or more "runners" or "legs" as long as the total number of legs is an odd number.
 - iii. The barrel section of the mandrel shall have a length of at least 75% of the inside diameter of the pipe.
 - iv. A proving ring shall be provided and used for each size mandrel in use.
 - v. Method Options: Adjustable or flexible mandrels are prohibited. A television inspection is not a substitute for the deflection test.
- i. Test Reports: Submit reports from tests in accordance with relevant standards.

4. Settlement Testing: For all gravity sanitary sewer pipe installed by open-cut method the Contractor shall conduct settlement testing of the newly installed sewer to determine whether excessive sagging of the pipe has occurred. This test does **not** identify the precise threshold at which pipe is properly installed. Rather, it provides a simple, easily interpretable means to identify grossly unacceptable installation of gravity sewer pipe. As such, passing this test shall not excuse poor workmanship identified by other means. Contractor shall follow construction QC/QA program established for the specified project per SAWS Standard Specification 903 and follow best practices to maintain horizontal and vertical alignment control.

- a. This test involves television inspection. Requirement for televising, video format, and submittals shall be governed by SAWS Standard Specification 866. If suitable to the project in question the settlement test televising efforts can be combined with but are in addition to and do not in any way replace or nullify, the efforts or requirements associated with SAWS Standard Specification 866.
- b. Unless otherwise directed by Engineer or Owner, no sewer flow should be introduced into the system when performing settlement test.
- c. This test shall be conducted no earlier than 30 days after installation of the sanitary sewer pipe and final backfill.
- d. For the purpose of this test the term "**segment**" is defined as all pipe between two manholes and/or structures and "**pipe section**" is defined as a single piece of pipe up to and including where it joins adjacent pipe(s).
- e. Segment must be isolated and cleaned to ensure no flow through pipe and

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- that it is free of dirt, rocks, scale, mud, silt, and any other foreign matter prior to performing this test.
- f. Contact the Inspector prior to testing so that they may witness flooding of the system and testing.
 - g. Water shall be introduced into the pipe to provide meaningful observations. To accomplish this, after cleaning, and immediately before performing this test, contractor shall flood system with an amount of water sufficient to flow from the upstream manhole through the segment to be tested and be observed flowing into the downstream manhole. Introduction of water will then be stopped and any standing water allowed to remain in the segment being tested. Testing shall commence when flow is no longer observed in downstream manhole. The established unit cost for settlement testing shall be inclusive of any and all water and work necessary to deliver water to test site and shall thus be provided by contractor at no additional cost to Owner.
 - h. Settlement testing varies by pipe diameter:
 - i. **For pipes from 8 to 42 inches in diameter:** After advancing television unit through pipe to be tested, connect golf ball with rigid wire and string as necessary for golf ball to be fully visible within CCTV footage and maintain contact with bottom of pipe as golf ball is pulled back through each segment. The golf ball shall have a diameter of 1.68 inches or 42.7 mm. Any and all points along the pipe segment at which the golf ball becomes fully submerged in standing water shall be defined as excessive sag.
 - ii. **For pipes 48 inches in diameter and larger:** Manned entry to the pipe will be made. A rigid steel ruler with zero (0) inch mark at the extreme end shall be placed in all areas of standing water in the pipe such that it is in contact with the lowest portion of the pipe's circumference and a reading of the depth of standing water shall be taken. All such readings shall be documented, including, at a minimum, the depth of water and location (STA or upstream or downstream distance from manhole/structure) of each reading taken. Any and all points along the pipe segment at which the measured depth of standing water exceeds 4.0% of the nominal diameter of the pipe in question shall be defined as excessive sag.
 - i. Any and all pipe section(s) of gravity sanitary sewer in which excessive sag is identified shall be rejected. Contractor shall correct each and every such pipe section, including as many upstream or downstream sections or segments as necessary to eliminate excessive sag(s) while maintaining grade required by the contract documents.

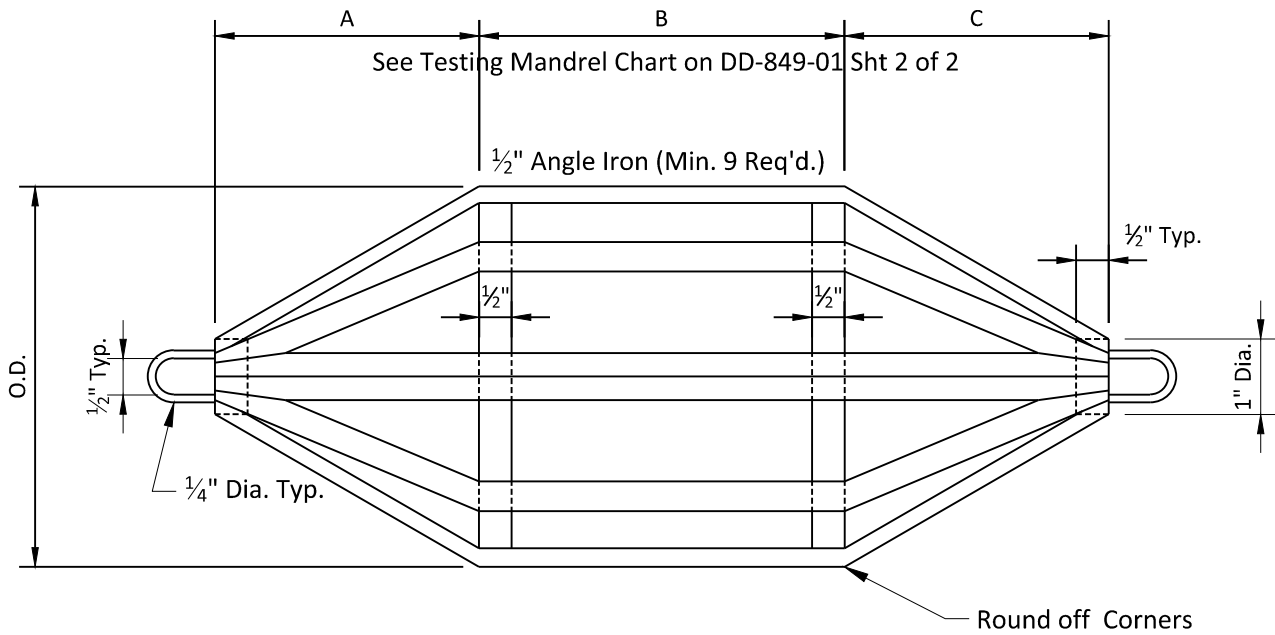
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- j. No segment, regardless of length, shall have more than three (3) excessive sags. Identification of more than three (3) excessive sags in a segment of pipe shall be cause for rejection and Contractor shall reinstall the segment in its entirety at no cost to Owner.
- k. All corrected sections and/or segments of pipe shall be retested at no additional cost to Owner until all pipe segments pass this and other tests required by SAWS Standard Specifications and contract documents for the project in question.
- l. Excessive sags shall be documented in video and shall be in accordance with NASSCO-(PACP) requirements per SAWS Specification Item No. 866.
- m. Provide televising and associated reports documenting the occurrence of the test and its results to Owner no later than 3 days following the test.

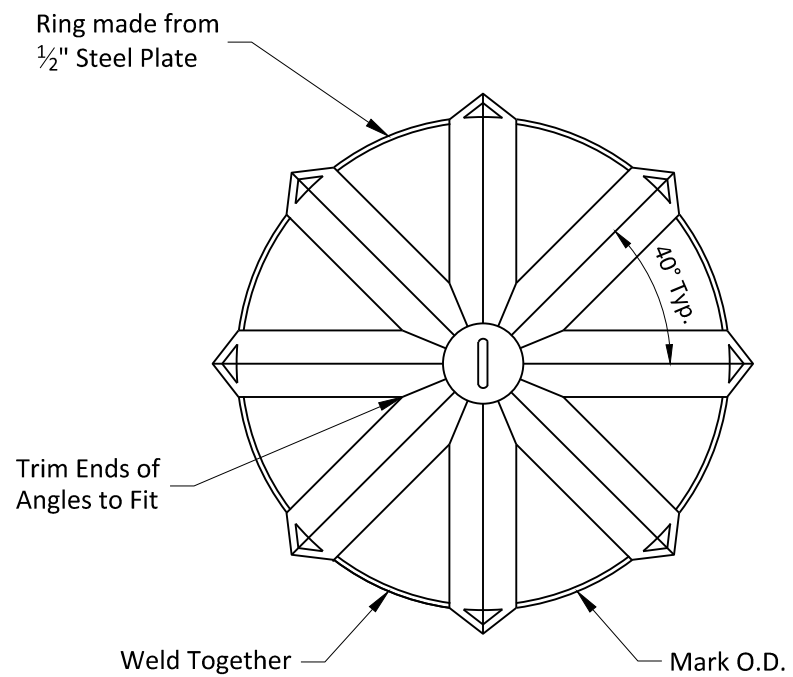
849.6 MEASUREMENT: Air/Infiltration/Exfiltration, and Deflection Testing will not be measured for payment.

849.7 PAYMENT: No direct payment shall be made for Air/Infiltration/Exfiltration and Deflection Testing and all costs in connection therewith shall be included in the applicable contract price for the item to which the work pertains. Refer to Specification 866 for payment of settlement testing.

-End of Specification-



SIDE OR TOP VIEW



END VIEW

Note:
 All Mandrels must be Approved by SAWS Construction Inspection Dept. and Stamped before Use.

| | | | |
|--|--|------------------|---------------|
| PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS | GO, NO GO DEFLECTION TESTING MANDREL | APPROVED | REVISED |
| | | March 2008 | December 2019 |
| | | DD-849-01 | |

| SIZE | A | B* | MANDREL O.D. | RING O.D. |
|------|-------|-------|------------------|------------------|
| | | | PVC (SDR -26) | PVC (SDR -26) |
| 6" | 4.0" | 4.5" | 5.50 | 4.79 |
| 8" | 5.5" | 6" | 7.37 | 6.66 |
| 10" | 7.0" | 7.5" | 9.21 | 8.50 |
| 12" | 8.0" | 9" | 10.96 | 10.25 |
| 15" | 10.0" | 11" | 13.42 | 12.71 |
| 18" | 12.0" | 13.5" | ———— | ———— |
| 21" | 14.0" | 16" | ———— | ———— |
| 24" | 16.0" | 18" | ———— | ———— |
| 27" | 18.0" | 20" | ———— | ———— |

*Minimum Length

CHART

Notes:

PVC Pipes and Fittings 6" to 15" in Diameter shall Conform to ASTM D-2241

PVC Pipes and Fittings 18" to 27" in Diameter shall Conform to ASTM F-679

This information is provided as a reference. All deflection testing shall be done in accordance with TCEQ Chapter 217.

| | | | |
|--|--|------------------|---------------|
| PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS | GO, NO GO DEFLECTION TESTING MANDREL CHART | APPROVED | REVISED |
| | | March 2008 | December 2019 |
| | | <i>DD-849-01</i> | |

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ITEM NO. 852

Sanitary Sewer Manholes

852.1 DESCRIPTION: This item shall govern the construction of standard sanitary sewer manholes complete in place and the materials therein, including manhole rings and covers.

852.2 REFERENCED STANDARDS: Reference standards cited in this Specification Item No. 852 refer to the current reference standard published at the time of the latest revision date.

1. San Antonio Water System (SAWS):
 - a. Specifications for Water and Sanitary Sewer Construction
 - b. SAWS Materials Specifications
2. City of San Antonio (COSA) Specifications for Construction
3. Texas Commission of Environmental Quality (TCEQ)
 - a. Chapter 217 Design Criteria for Domestic Wastewater Systems
 - b. Chapter 213 (“Edwards Aquifer”)
4. AASHTO – American Association of State Highway and Transportation Officials:
 - a. M306: Standard Specification for Drainage, Sewer, Utility, and Related Castings.
5. ASTM – American Society for Testing and Materials:
 - a. ASTM A 307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile
 - b. A536: Standard Specification for Ductile Iron Castings.
 - c. ASTM A 615 - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
 - d. ASTM C 443 - Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.
 - e. ASTM C 478 - Standard Specification for Precast Reinforced Concrete Manhole Sections
 - f. ASTM C 890 - Standard Practice for Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures
 - g. ASTM C 913 – Standard Specifications for Precast Concrete Water and Wastewater Structures.
 - h. ASTM C 990 – Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants
 - i. ASTM D638: Test Method for Tensile Properties of Plastics.
 - j. ASTM D648: Standard Test Method for Deflection Temperature of Plastics under Flexural Load in the Edgewise Position.
 - k. ASTM D 698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lb/ft.)

San Antonio Water System Standard Specifications for Construction

- l. ASTM D790: Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
 - m. ASTM D1238: Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer.
 - n. ASTM D1505: Standard Test Method for Density of Plastics by the Density-Gradient Technique.
 - o. ASTM D1693: Standard Test Method for Environmental Stress-Cracking of Ethylene Plastics.
 - p. ASTM D 2665 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste and Vent Pipe and Fittings
 - q. ASTM D 2996 - Standard Specification for Filament-Wound “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe
 - r. ASTM D 2997 - Standard Specification for Centrifugally Cast “Fiberglass” (Glass-Fiber-Reinforced Thermosetting Resin) Pipe
6. American Society of Mechanical Engineers
- a. ASME B 16.1 - Cast Iron Pipe Flanges and Flanged Fittings

852.3 SUBMITTALS: Contractor shall submit manufacturer’s product data, instructions, recommendations, shop drawings, and certifications. All submittals shall be in accordance with Engineer’s requirements, and submittals shall be approved by the Engineer prior to delivery.

1. Plan operations to minimize disruption of utilities to occupied facilities or adjacent property.
2. Submit all test reports and pre and post sewer television inspection video.
3. Videos become property of SAWS.

852.4 MATERIALS: All constructed manholes shall be watertight and equipped with pre-tested and approved ring and covers. Sewer manhole ring and cover castings shall meet the current requirements of the American Association of State Highway and Transportation Officials (AASHTO) Designation M306-10.

1. Concrete Manhole Components: For new concrete manholes, all concrete manhole components (cast-in-place or precast manhole base, precast risers, precast cone sections, cast-in-place or precast flat tops, and as applicable) for new manholes shall conform to the applicable requirements of ASTM Designation C478, except as modified below.
 - a. Concrete Grout: All concrete grout used for patching or other similar fill-in work shall be of non-shrink type made with the Komponent[®] admixture specified above, or approved alternate, in accordance with the manufacturer’s recommended formulation with Portland cement, fine aggregate, water, and water reducer to produce a compressive strengths of approximately 4,800 psi within 7 days and 7,250 psi within 28 days at a 70 °F baseline temperature.

San Antonio Water System Standard Specifications for Construction

2. The manhole ring and cover shall be of ductile iron or gray cast iron construction. The cover shall be solid with no vent or pick holes; hinged with underlying special hinge area leakage protection; the cover secured with four (4) stainless steel bolts; and shall have a recessed “pick bar” for cover opening. Cam lock type covers shall not be allowed.
 - a. Approved manufacturers, as listed in the SAWS Approved Products List (APL), have previously completed required inflow leakage shop testing and have met a maximum allowable leakage rate criterion of 1 gallon per minute (gpm) at 12 inches of water submergence above the manhole cover.
 - b. Nominal cover diameter shall be 32 inches, with 30-inch clear opening, as required by TCEQ
 - c. Vented Manhole Covers will be specified by Engineer.
3. “Throat rings” shall be made of HDPE and have a maximum thickness of 2 inches. No concrete throat rings shall be used.
 - a. The internal diameter shall match that of the ring and cover’s opening. HDPE “throat rings” are to be used in conjunction with a UV stabilized internal polyethylene liner for the purpose of providing an infiltration/inflow (I/I) barrier.
 - b. The I/I Barrier shall be as manufactured by Strike Tool Products of Cannon Falls, MN. See SAWS APL.
 - c. Note of Clarification: A minimum of two and a maximum of six “throat rings” may be used at each adjusted manhole. “Throat rings” are limited to a minimum of two and a maximum of four rings for new manhole construction. Throat rings shall be a maximum thickness of two (2) inches.
4. Bitumastic Joint Sealant, flat tops, and between the ductile or gray cast iron ring (frame) and the uppermost adjustment ring or flat top: See Approved APL.
5. For rehabilitated manholes; first, apply a combination of cementitious coatings followed by an approved epoxy coating. Kerneos SewperCoat 2000 HS and PG, applied at the required one-inch thick application, is the only product approved which does not require a subsequent epoxy coating.
6. Other approved materials are located on SAWS website under SAWS Approved Products List. The list is periodically updated and should be checked by Contractor prior to start of construction.
7. For reconstructed manholes; first, apply a combination of cementitious coatings followed by an approved epoxy coating with the cementitious coating first. Kerneos SewperCoat 2000 HS and PG, applied at the required one-inch thick application, is the only product approved which does not require a subsequent epoxy coating.
8. Other approved materials are located on SAWS website under SAWS Approved Products List. The list is periodically updated and should be checked by Contractor prior to start of construction.
9. New Manholes shall be precast manholes.
 - a. Manufacturer shall be approved by SAWS Products Standard Committee and be on the APL.

San Antonio Water System Standard Specifications for Construction

10. Shallow manholes have a depth of 4 feet or less measured from the top of cover to sewer invert.
11. Each manhole joint shall be sealed with Infi-Shield® Gator Wrap external rubber sleeve as manufactured by Sealing Systems, Inc. The seal shall be made of Stretchable, Self-Shrinking, Intra-Curing Halogenated based rubber with a minimum thickness of 30 mils. The back side of each unit shall be coated with a cross-linked re-enforced butyl adhesive. The butyl adhesive shall be non-hardening sealant, with a minimum thickness of 30 mils. The seal shall stretch around the substrate then overlapped creating a cross-link and fused bond between the rubber and butyl adhesive.

852.5 CONSTRUCTION:

1. Manholes shall be constructed of materials and workmanship as described by these specifications, at such places shown in the contract documents or as designated by the Engineer, and in conformity with the typical details and sketches shown.
2. Unless otherwise shown in the contract documents or approved by the Engineer, standard sanitary sewer manholes shall be constructed with influent and effluent piping less than or equal to 24 inches in diameter with precast reinforced concrete manhole sections.
3. A standard sanitary sewer manhole shall be a single entrance cylindrical structure, having a minimum internal diameter of 4 feet between the cone and base sections.
4. The base of the structure shall include the load bearing portion beneath and exterior of the structure, invert channels and the fill or bench portions adjacent to the lower sewer pipes within the structure.
5. When the manhole depth is 4 feet or less, but not less than three (3) feet, provide a shallow type manhole. Maximum pipe size for shallow type manholes is 12-inch diameter.
6. Special shallow cone sections, or flat cover slabs, shall be used for shallow manholes.
7. The maximum vertical height of the diameter adjustment section or cone shall be 36 inches.
 - a. Adjustment of throat rings may be used for final elevation adjustment of the manhole ring and cover.
 - b. Concrete encasement of the manhole's ring shall be as shown in the DD-852 Standard Drawing Series.
 - c. Ring and cover shall be attached to the diameter adjustment flat top section or cone.
 - d. Manholes which differ from the above description shall be governed by Specification Item No. 850, "Polymer Concrete Sanitary Sewer Structures."
 - e. An External drop manhole shall be provided for a sewer entering a manhole more than 30 inches above the invert, as per TCEQ Rules and Regulations Chapter 217 Design Criteria for Domestic Wastewater Systems.
8. Footings or bases of manholes shall be a minimum of 6 inches in depth below the bottom of the pipe.

San Antonio Water System Standard Specifications for Construction

9. All invert channels shall be constructed and shaped accurately so as to be smooth, uniform and cause minimum resistance to flow.
10. The bench shall be finished smooth with a slope of ½ inch per foot from the manhole walls to the edges of the invert.
11. The top half of all sewer pipes within the invert channel or bench zone shall be removed flush to the inside manhole walls.
12. Joints on sewer pipes shall not be cast or constructed within the wall sections of manholes.
13. Concrete cradles shall be required for new pre-cast manholes.
14. Concrete cradles shall extend beyond the outside walls of the manhole a minimum of 36 inches.
15. Voids between exterior pipe walls and manhole walls at all pipe connections in manholes shall be filled with a non-shrink grout, as specified above, or as approved by the Engineer, or as shown in the contract documents and inspected prior to backfilling.
16. Where connections to existing manholes are required, the adjacent pipe bedding shall be prepared to proper grade, the existing manhole neatly cored and the new pipe inserted so that the end is projecting 2 inches from the inside wall.
17. The invert shall then be reshaped to properly channel new flows.
18. Debris of any kind shall be kept out of new or existing manholes or mains.
19. Joints between cones, risers, adjustment rings, flat tops, and between the ductile cast iron ring and the uppermost adjustment ring or flat top, as applicable, shall be thoroughly sealed in accordance with manufacturer's recommendations with adhesive bitumastic products as specified above.

Where precast concrete risers are used, any gaps in the outer joint surfaces shall be additionally coated with non-shrink grout to a minimum thickness of ¼ inch.

20. All manhole rings shall be encased with 4,000 psi reinforced concrete as shown in the contract documents or as approved by the Engineer.
 - a. Concrete manhole ring encasement shall extend 6 inches below the top of the cone and have a minimum width when measured at the manhole ring of 1 foot. The surface of the encasement shall be flush with the top of the manhole ring.
21. All new manholes shall be encased with a minimum of 12 inches thickness of flowable fill to one foot above the top of the cone section to allow for the concrete ring encasement. See DD-852 drawing series.

852.6 TESTING: The Contractor shall notify Inspector and Engineer 48 hours prior to beginning of manhole testing and only after a successful pretest has been performed.

1. The Contractor shall perform the testing for all sanitary sewer manholes in accordance with the following:
2. All manholes must pass a leakage test.
3. The Contractor shall test each manhole (after assembly and backfilling) for leakage, separate and independent of all other sanitary sewer piping, by means of either a

San Antonio Water System Standard Specifications for Construction

hydrostatic test, vacuum test, or other methods approved by the Engineer.

4. The Contractor is hereby instructed to conduct either of the two identified tests in the following manner:
 - a. Hydrostatic testing shall be conducted by utilizing approved plugs to seal all influent and effluent pipes in the manhole and filling the manhole to the top of the cone with water.
 - (1) Additional water may be added over a 24-hour period to compensate for absorption and evaporation losses.
 - (2) At the conclusion of the 24-hour saturation period, the manhole shall be filled to the top and observed.
 - (3) Any measurable loss within a 30-minute period shall be considered an unsuccessful test and thus require the Contractor to assess the needed repairs, perform such repairs (subject to the approval of the Engineer), and notify the Inspector when the retest will be performed.
 - (4) All effort, materials, or other costs shall be solely at the Contractor's expense.
 - b. Vacuum Testing: Manholes shall be tested after construction/installation and backfilling with all connections (existing and/or proposed) in place.
 - (1) Drop-connections and gas sealing connections shall be installed prior to testing.
 - (2) The lines entering the manhole shall be temporarily plugged with the plugs braced to prevent them from being drawn into the manhole.
 - (3) The plugs shall be installed in the lines beyond drop connections, gas sealing connections, etc.
 - (4) Prior to performing the test, the Contractor shall plug all lift holes and exterior joints with a non-shrink grout and plug all pipes entering the manhole.
 - (5) Only a cementitious coating may be applied.
 - (6) Contractor shall use a minimum 60 inch-lb. torque wrench to tighten the external clamps that secure the test cover to the top of the manhole.
 - (7) The test head shall be inflated in accordance with the manufacturer's recommendations.
 - (8) A vacuum of 10 inches of mercury shall be drawn, and the vacuum pump will be turned off.
 - (9) With the valve closed, the level vacuum shall be read after the required test time.
 - (10) If the drop in the level is less than 1 inch of mercury (final vacuum greater than 9 inches of mercury), the manhole will have passed the vacuum test.
 - (11) The required test time is 2 minutes.

San Antonio Water System Standard Specifications for Construction

- c. Acceptance: Any manhole which fails the initial test must be repaired with a non-shrink grout or other suitable material based on the material of which the manhole is constructed.
 - d. The manhole shall be retested as described above until a successful test is attained.
 - e. After a successful test, the temporary plugs will be removed.
 - f. To ensure that the plugs have been removed, Contractor shall only do so in the presence of the Inspector.
 - (1) Repairs to Existing Manholes: Any existing manhole which fails to pass the hydrostatic/vacuum test shall be closely examined by the Inspector and the Contractor to determine if the manhole can be repaired.
 - g. Thereafter, the Contractor shall either repair or remove and replace the manhole as directed.
 - h. Any manhole excavated for repairs or excavated for tie in, shall be backfilled with a minimum of 12 inches thickness of flowable fill to one foot above the top of the cone section to allow for the concrete ring encasement.
 - i. After abrading and cleaning, additional protective coating material shall be applied to the repair area.
 - j. All touch-up repair procedures shall follow the protective coating manufacturer's recommendations
5. If a sanitary manhole fails to pass one of the above tests, it shall be repaired in accordance with the manufacturer's recommendations and re-tested. Should the test fail a second time, Contractor shall perform another leak test utilizing the other testing option in this specification. Should the test fail the third time, Contractor shall remove and replace the manhole and perform all the necessary test at no additional cost to SAWS. Manholes shall not be accepted until it passes all tests.
6. Engineer of Record must witness all tests over the EARZ.

852.7 MEASUREMENT: All manholes zero feet to 6 feet deep and designated in the contract documents will be measured as the total number of such manholes constructed, including those exceeding 6 feet in depth from the lowest invert elevation to the top of the ring.

1. Manholes deeper than 6 feet shall be measured by the number of vertical feet in excess of 6 feet.

852.8 PAYMENT:

1. All manholes shall be paid at the contract unit price bid for each such manhole, which price shall be full compensation for all precast sections or throat rings, UV stabilized polyethylene liner, cones, bases, rings and covers, manhole ring, encasement, manhole rubber joint seal, flowable fill, mortar, drop pipes, saws cutting of surfaces, surface restoration, and fittings, labor, tools, equipment, testing, tees, wyes, and incidentals necessary to complete the work.

San Antonio Water System Standard Specifications for Construction

2. Extra depth manholes shall be paid for at the contract unit price bid per vertical foot as measured above.
3. Shallow manholes shall be paid at the contract unit price.
4. Concrete cradles for pipes shall be measured and paid for at the contract unit price bid as provided for in Specification Item No. 858, "Concrete Encasement, Cradles, Saddles and Collars."
5. Gravel subgrade filler for manholes shall not be measured separately for payment.

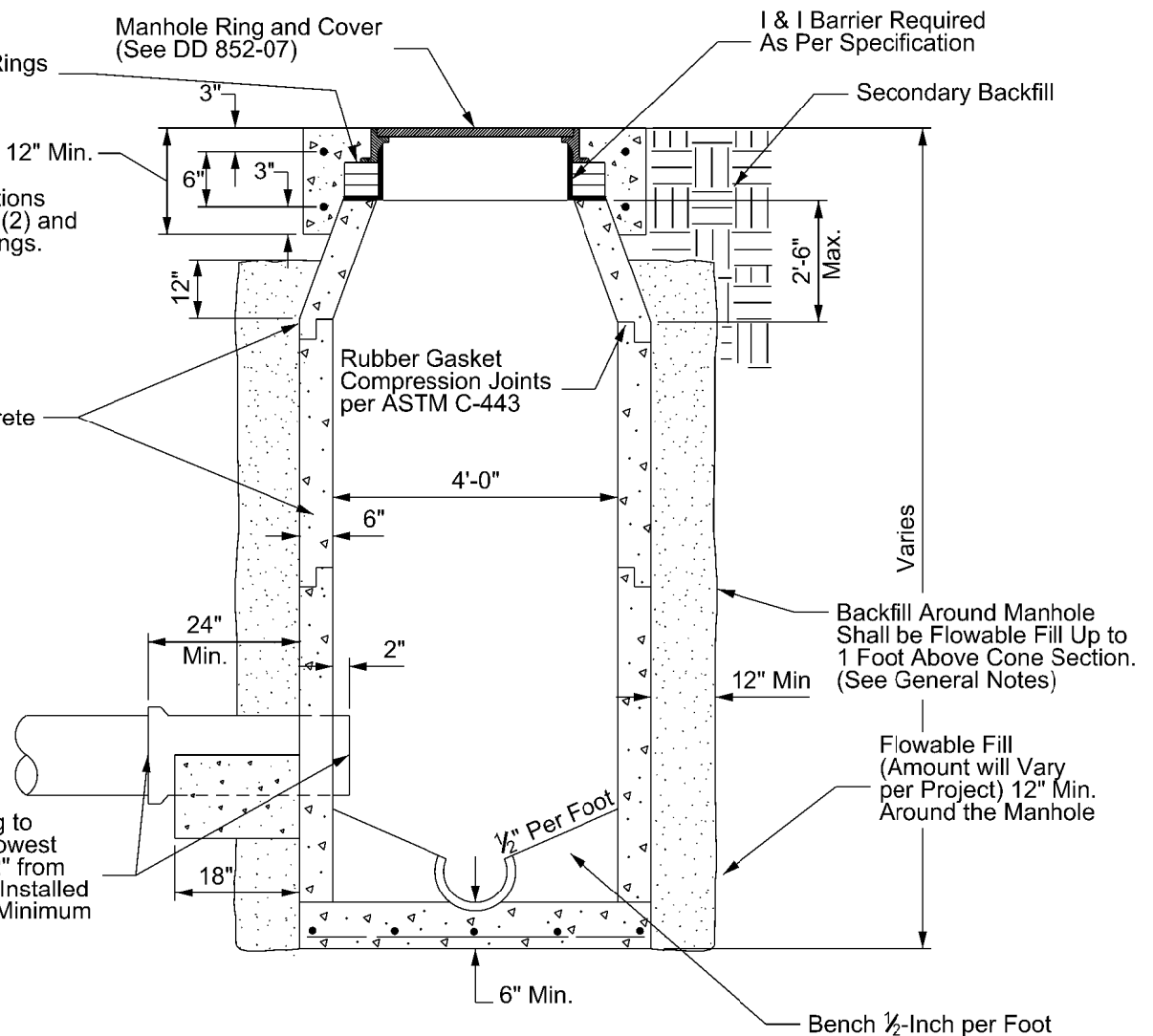
- End of Specification-

Adjusted:
A Minimum of (2) and a Maximum of (6) Throat Rings Shall be Used at Each Adjusted Manhole.

New:
All New Manhole Installations Shall have a Minimum of (2) and Not Exceed (4) Throat Rings.

Precast Reinforced Concrete Manhole Sections ASTM Designation C-478
4000 psi min. Strength in 28 Days

Note "A"
Sewer Pipe Connecting to Manholes Above the Lowest Sewer Shall Protrude 2" from the Inside Wall and be Installed with a Joint Located a Minimum 24 Inches



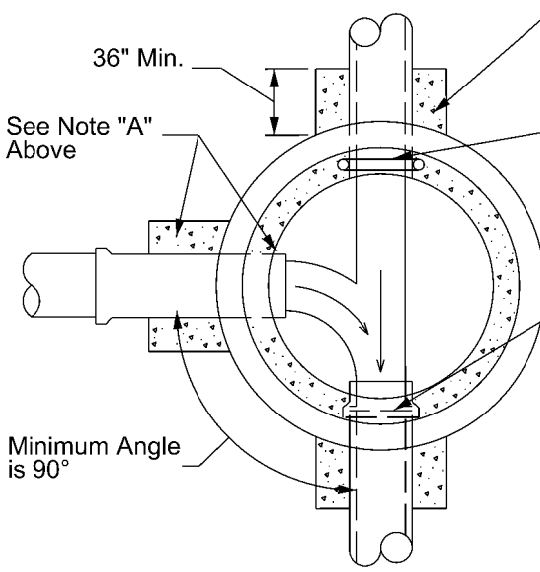
PRECAST MANHOLE

Concrete Cradle to Nearest Point of all Lines Leaving or Entering Manholes
All Pipe is Used, Provide Rubber Gasket One Size Smaller than Pipe at Each Wall Crossing of Manhole, If HDPE Pipe is Used a Non-Shrink Grout to be Applied within the Wall Sections, Gasket is also, Required.

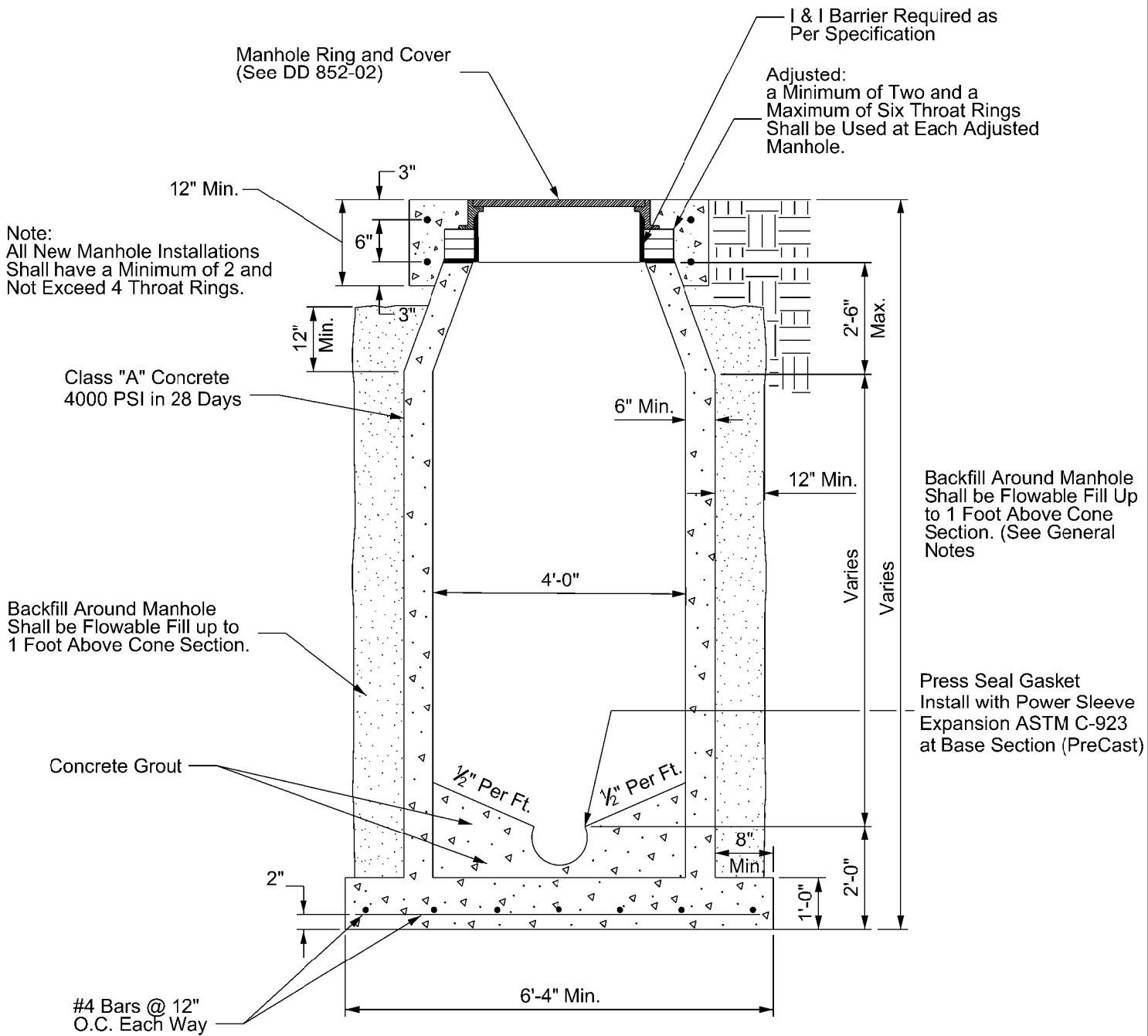
No Joints for Pipe will be Allowed within Wall Section

General Notes:

1. Material for Sanitary Sewer Pipe must be the Same from Manhole to Manhole. Changes in Type of Pipe may be Made Only at Manholes, or Special Structures, except as Approved by the SAWS Inspector.
2. Adapters and Concrete Collars shall be Used as Directed and Approved by the SAWS Inspector.
3. Watertight Manhole Rings and Covers shall be Trans-Tex A77 "O" Ring or Approved Equal.
4. The Minimum Angle of Flow for a Connecting Sewer to the Direction of Flow Defined by a Collection System is 90 Degrees, unless Approved by the Engineer.



PRECAST MANHOLE



MONOLITHIC MANHOLE

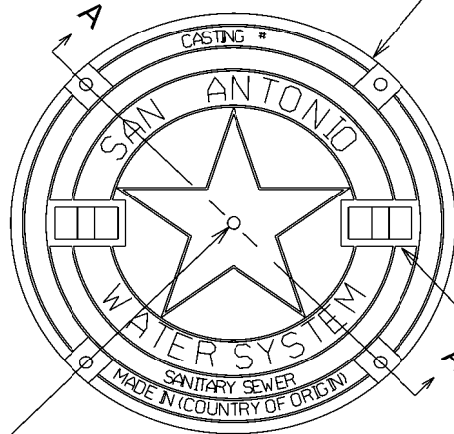
General Notes:

1. Material for Sanitary Sewer Pipe Must be the Same from Manhole to Manhole. Changes in Type of Pipe May be Made only at Manholes, or Special Structures, Except as Approved by the Project Engineer.
2. Adaptors and Concrete Collars shall be used as approved by the SAWS Project Engineer.
3. Watertight Manhole Rings and Covers shall be Trans-Tex A77 "O" Ring or Approved Equal.

| | | | |
|---|--------------------------------|------------|-----------------|
| PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS | STANDARD MONOLITHIC MANHOLE | APPROVED | REVISED |
| | | March 2008 | AUG 2019 |
| DD 852-01 | | | SHEET 2 OF 2 |

Note:
Standard Manhole Ring and Cover:
All applicable dimensions shall
conform to the dimensions shown
here

Vented Manhole
Ring and Cover



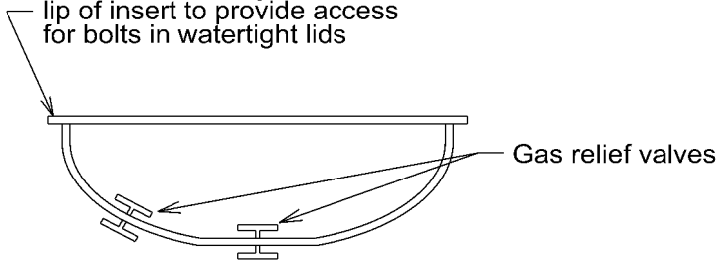
Lift Slot for Lifting Bar

Note:
The bearing surfaces and
O-Ring groove shall be
Machine ground

1" Dia. Cast Hole

VENTED MANHOLE RING AND COVER

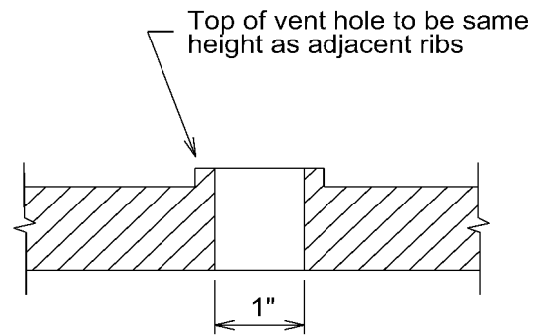
Slots or holes may be cut in
lip of insert to provide access
for bolts in watertight lids



Gas relief valves

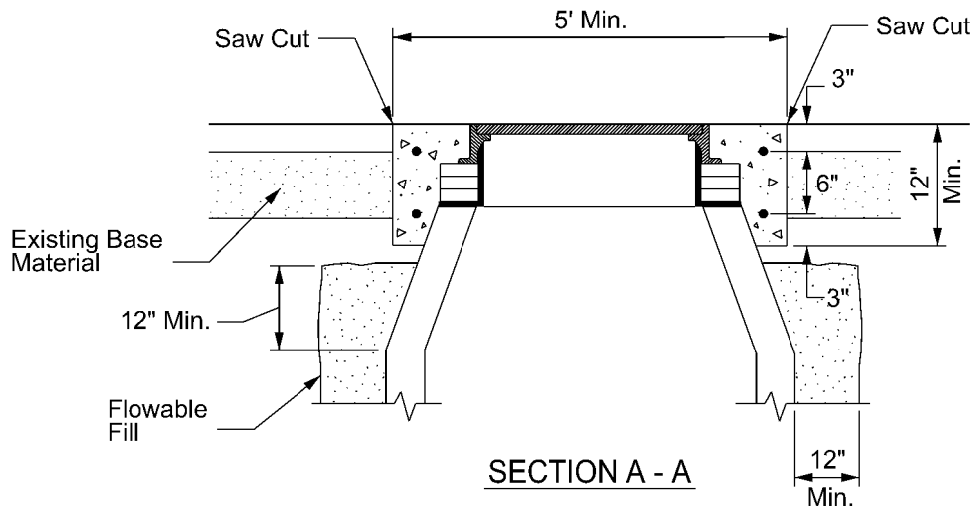
**WATERTIGHT MANHOLE
INSERT DETAIL**

Top of vent hole to be same
height as adjacent ribs

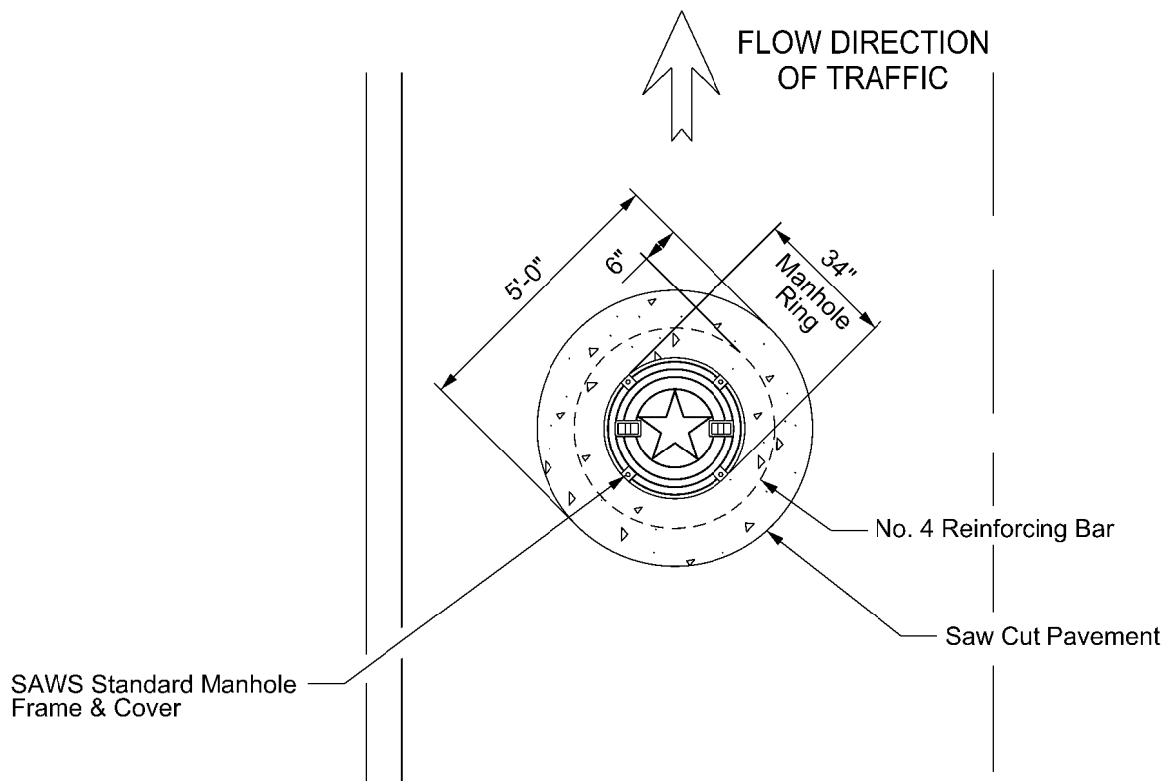


**VENT HOLE DETAIL
SECTION A-A**

Manhole cover inserts shall be installed in strict accordance with the manufacturer's recommendations. The contractor shall be responsible for making the necessary field measurements for the manufacturer prior to production.



SECTION A - A



NOTE:

1. The Concrete Shall be 4000 PSI Minimum and Reinforced with No. 4 Bars as Shown.
2. The Concrete Shall Extend to Edge of Saw Cut Pavement.
3. Manhole Ring Encasement is Required on all Manholes.
4. Manhole Lid shall Open in the Direction of Traffic or Downstream in Parkway

PROPERTY OF
SAN ANTONIO WATER SYSTEM
SAN ANTONIO, TEXAS

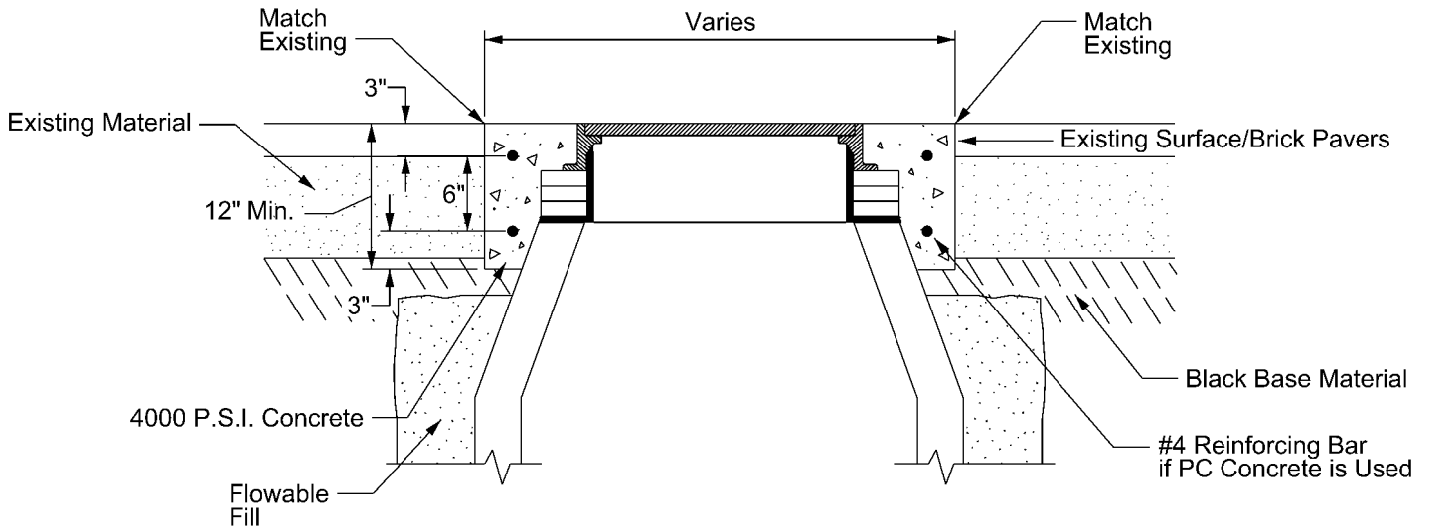
MANHOLE RING
ENCASEMENT DETAIL

APPROVED
AUGUST 2009

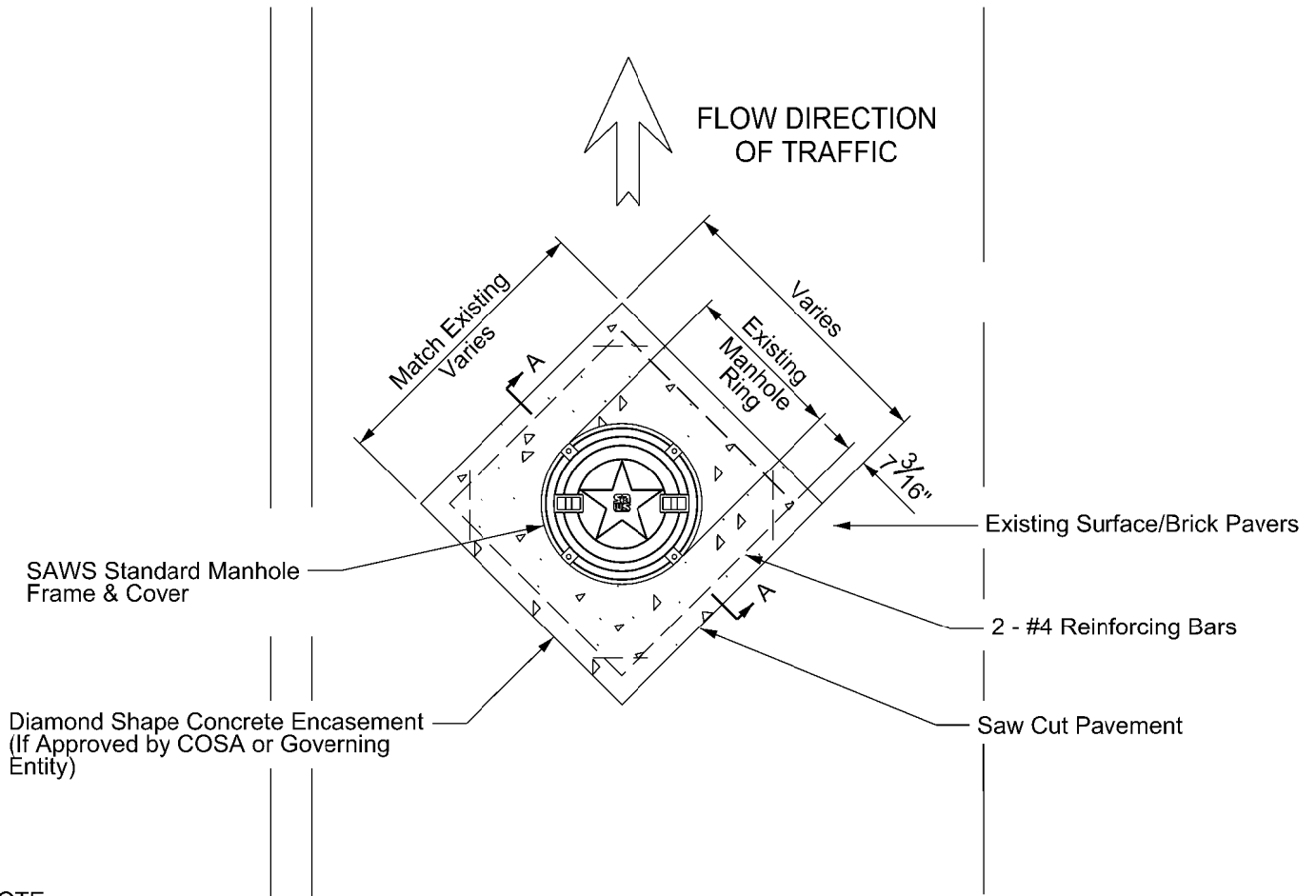
REVISED
AUG 2019

DD 852-03

SHEET
1 OF 2



SECTION A - A



NOTE:

1. The Concrete Shall be 4000 PSI, Minimum and Reinforced with 2 - #4 Bars as Shown.
2. The Concrete Shall Extend to Edge of Saw Cut Pavement.
3. Manhole Ring Encasement is Required on all Manholes.
4. Manhole Lid Shall Open in the Direction of Traffic or Downstream in Parkway.

PROPERTY OF
SAN ANTONIO WATER SYSTEM
SAN ANTONIO, TEXAS

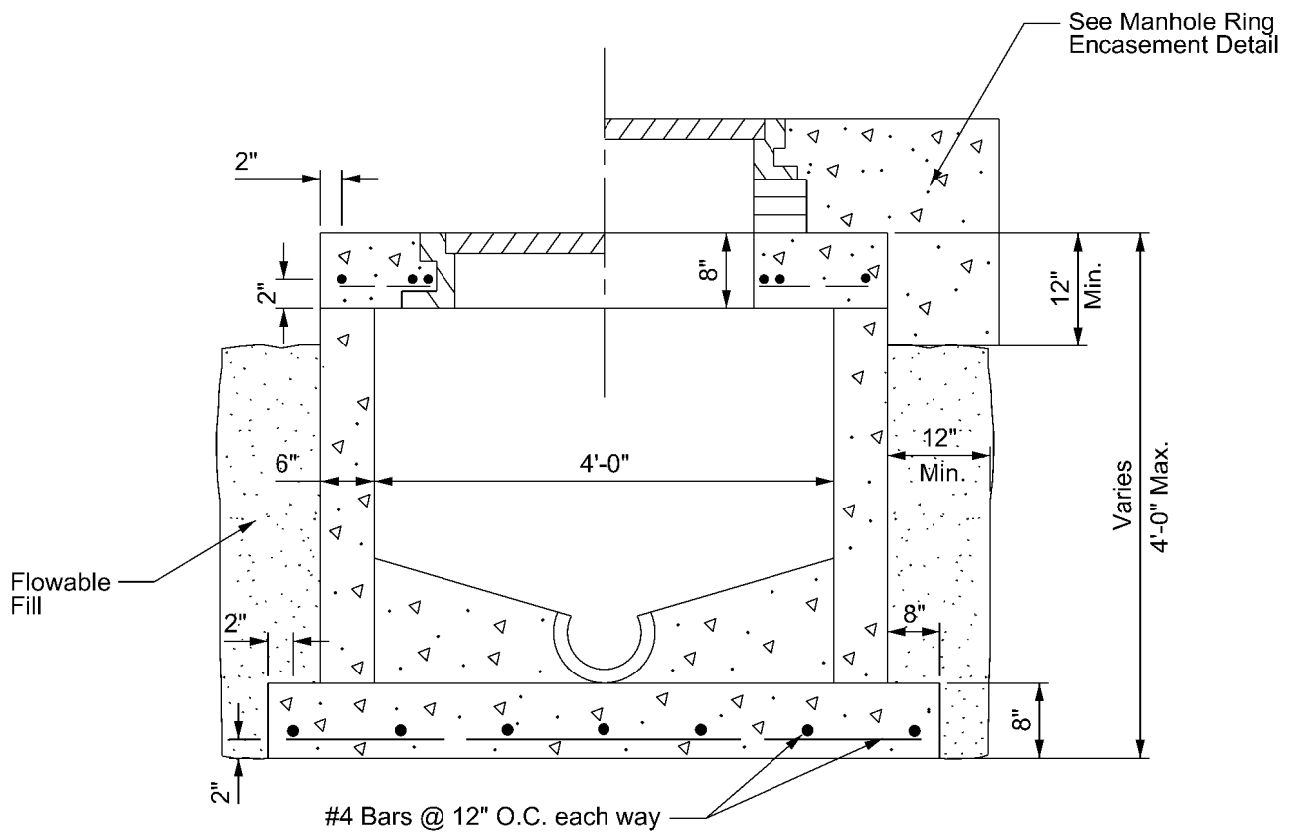
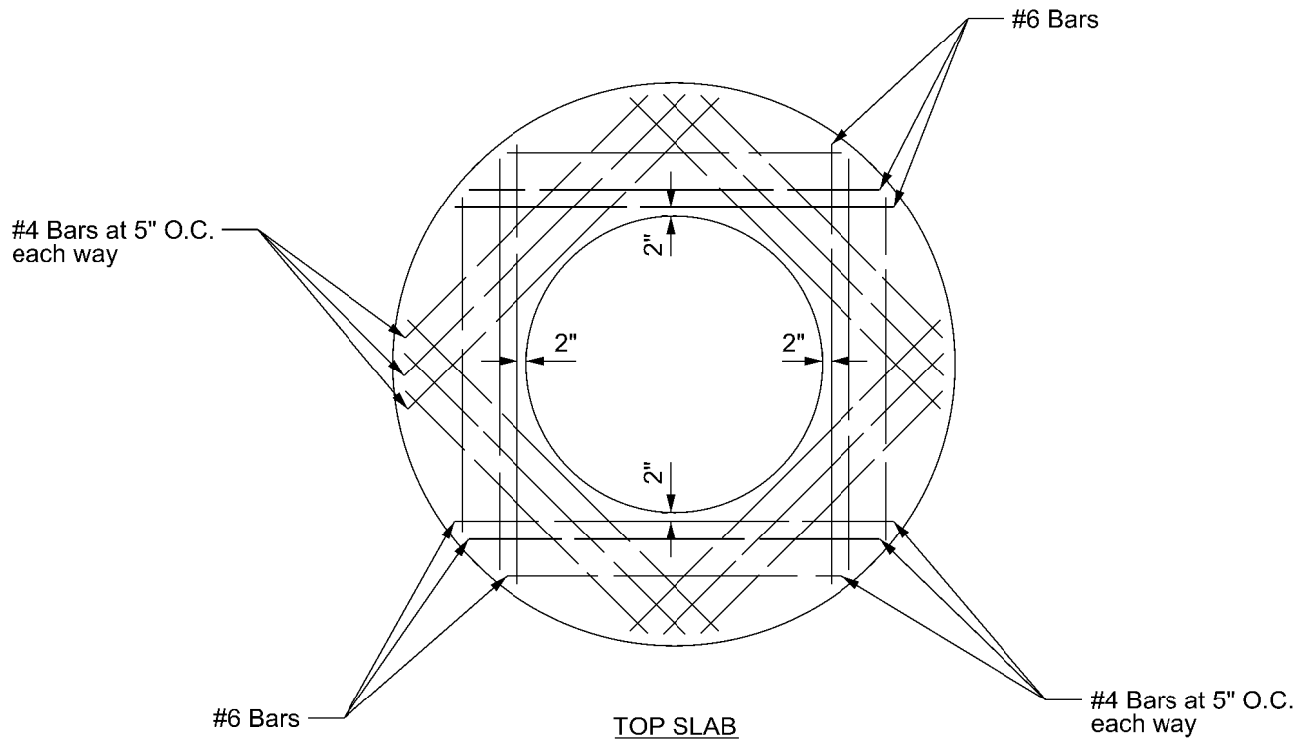
MANHOLE RING
ENCASEMENT DETAIL
DOWNTOWN

APPROVED
MARCH 2008

REVISED
AUG 2019

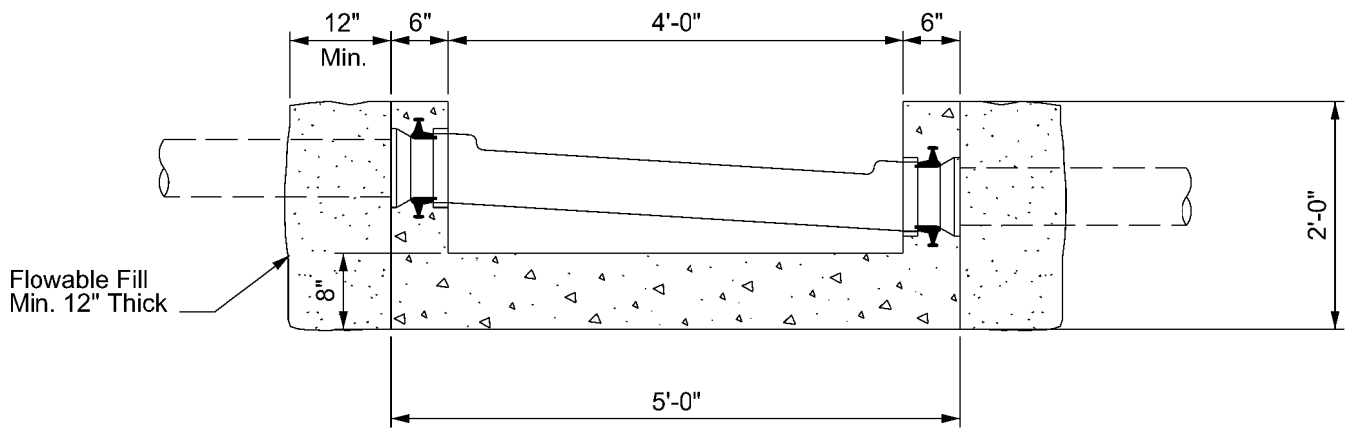
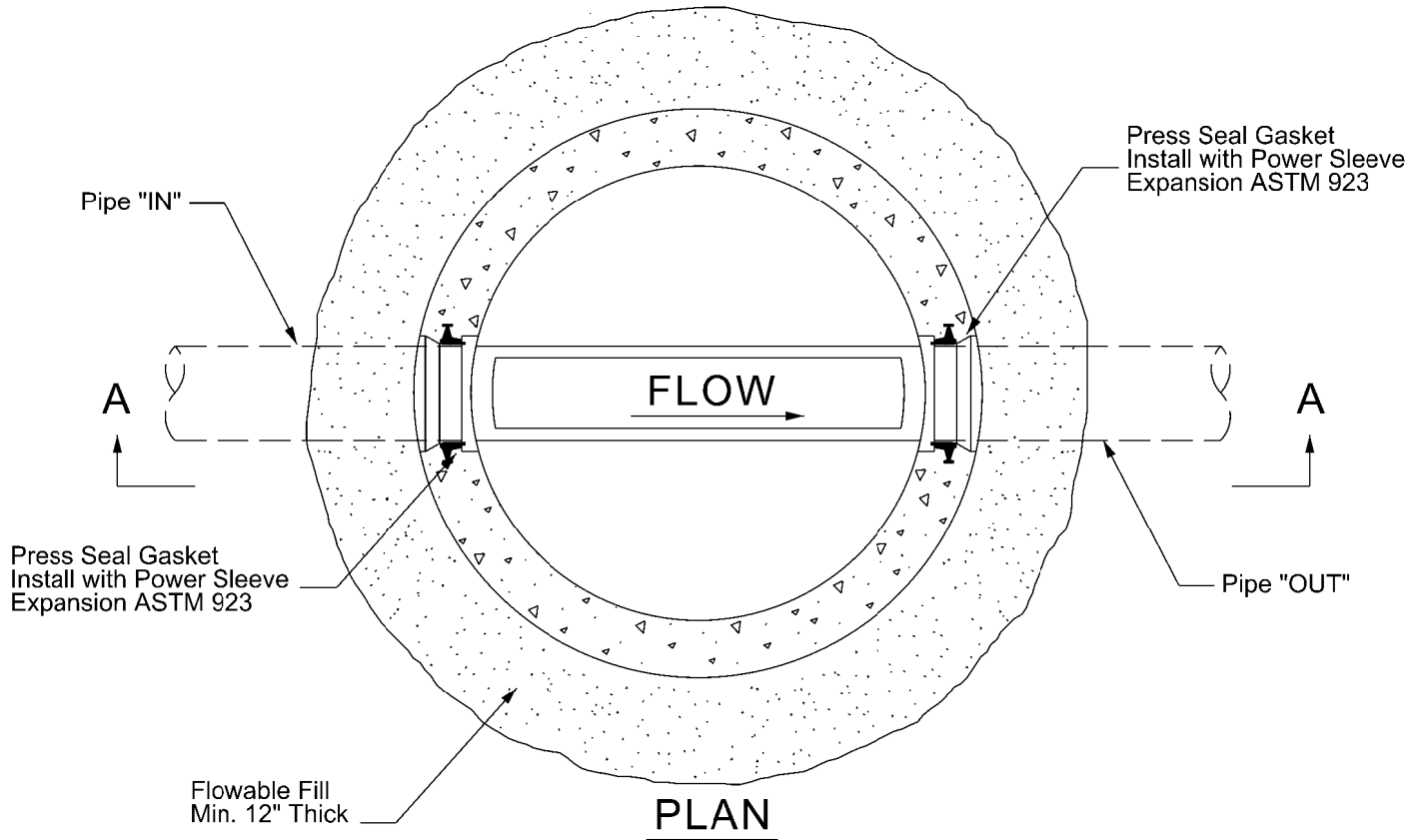
DD 852-03

SHEET
2 OF 2



SHALLOW MANHOLE
PRECAST OR MONOLITHIC

| | | | |
|---|---------------------------|------------|-----------------|
| PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS | SHALLOW MANHOLE DETAIL | APPROVED | REVISED |
| | | MARCH 2008 | AUG 2019 |
| | | DD 852-04 | |
| | | | SHEET 1 OF 1 |



PROPERTY OF
SAN ANTONIO WATER SYSTEM
SAN ANTONIO, TEXAS

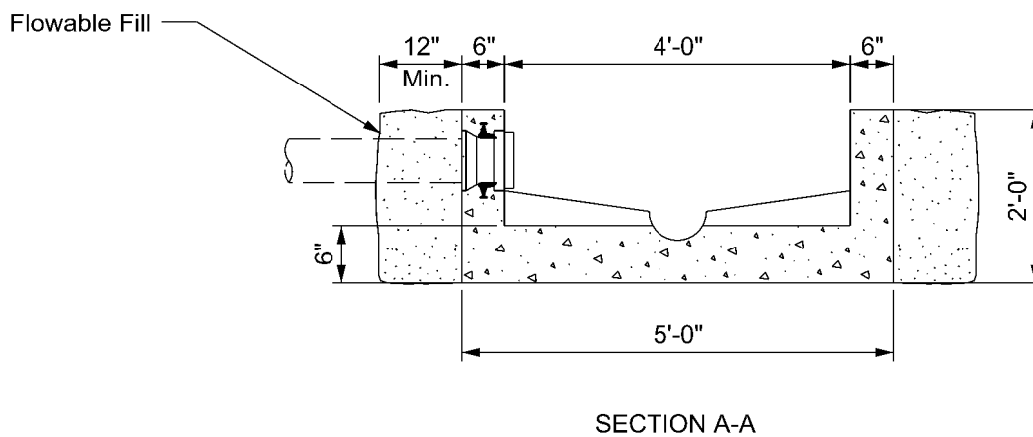
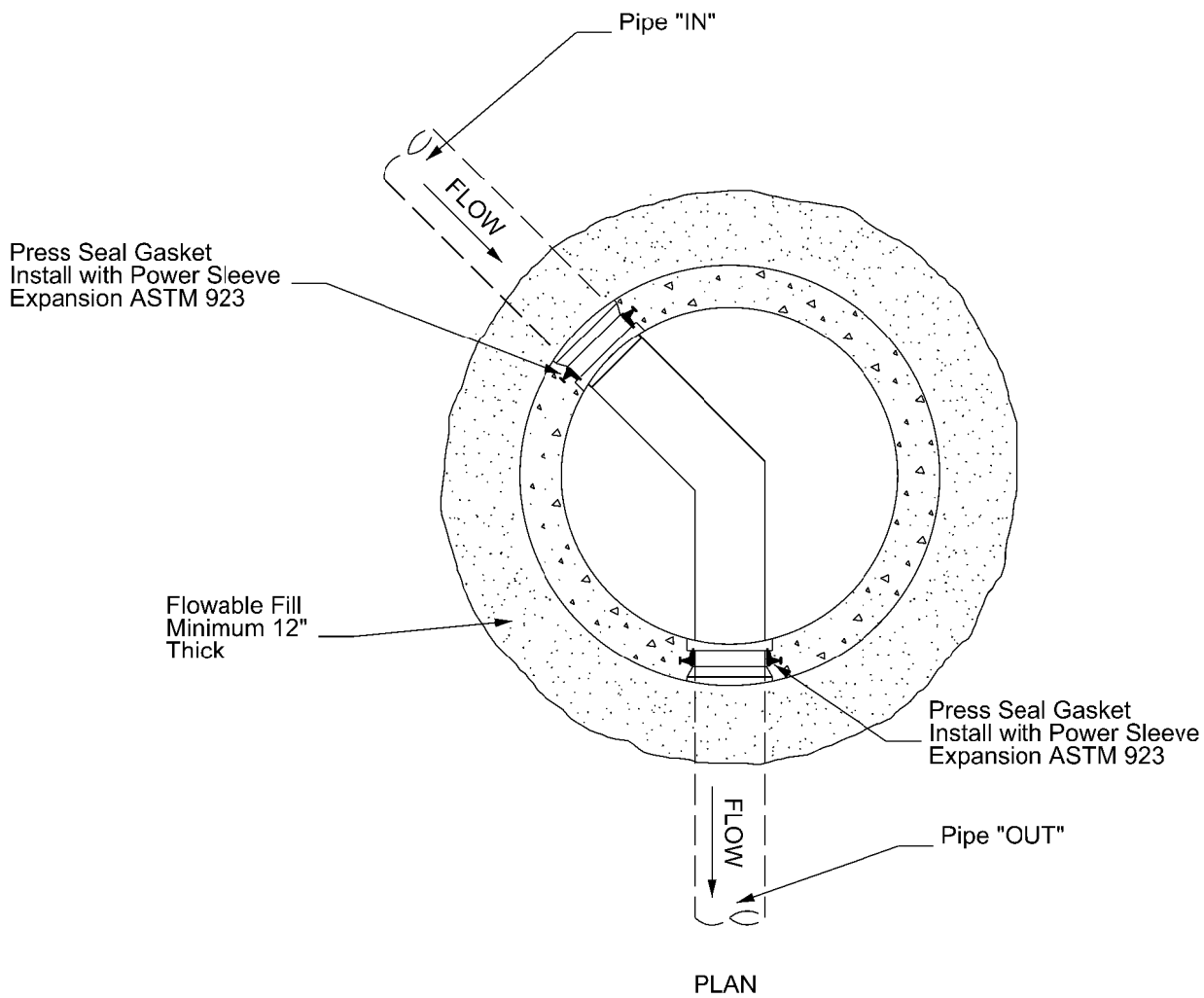
PRECAST MANHOLE BASE
STRAIGHT THROUGH

APPROVED
MARCH 2008

REVISED
AUG 2019

DD-852-05

SHEET
1 OF 1



PROPERTY OF
SAN ANTONIO WATER SYSTEM
SAN ANTONIO, TEXAS

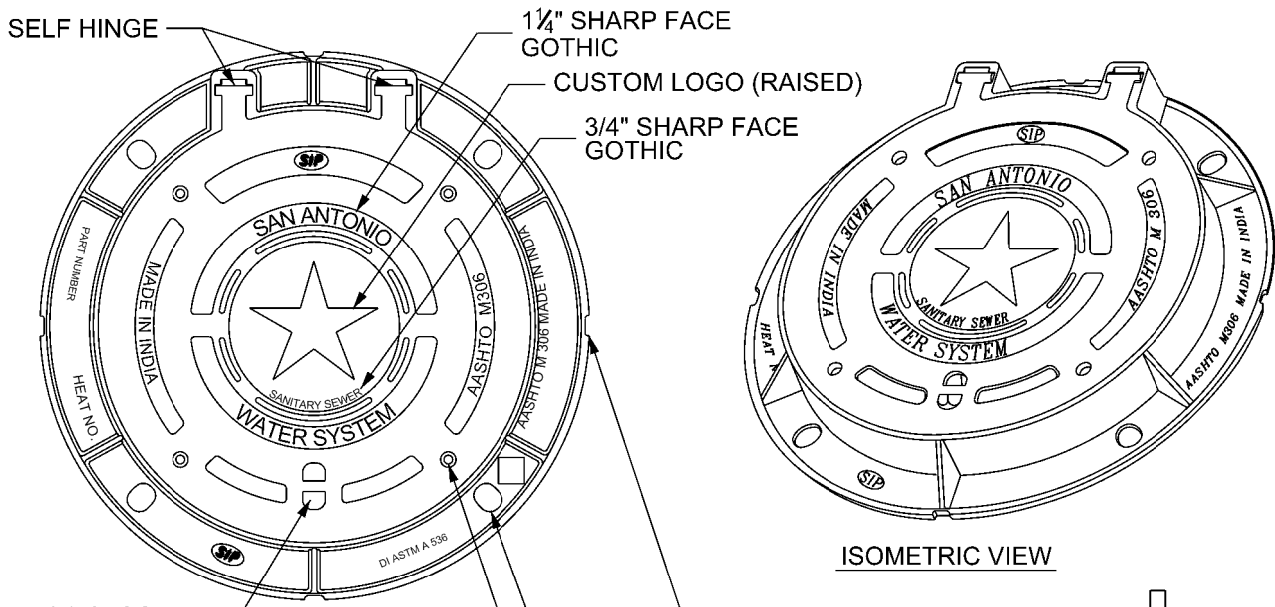
PRECAST MANHOLE BASE
45° ANGLE

APPROVED
MARCH 2008

REVISED
AUG 2019

DD-852-06

SHEET
1 OF 1

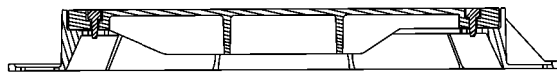


(1) CLOSED PICKHOLE

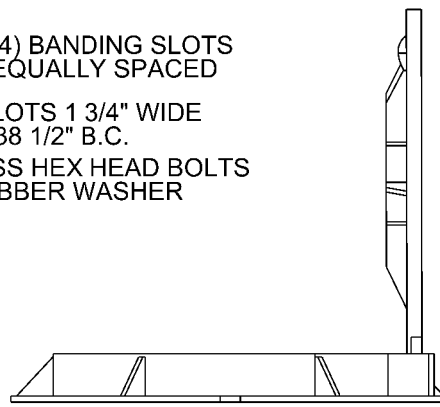
(4) BANDING SLOTS EQUALLY SPACED

(4) BOLT SLOTS 1 3/4" WIDE ON 36" TO 38 1/2" B.C.

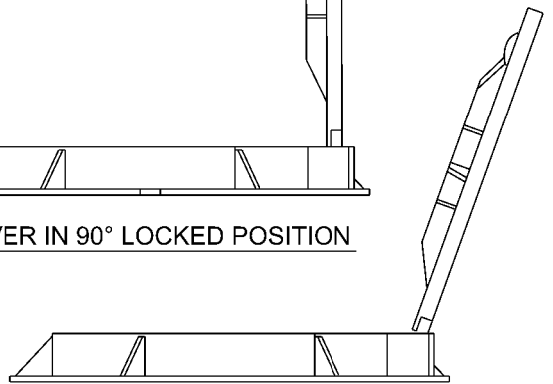
(4) 1/2" - 13 SS HEX HEAD BOLTS W/ SS & RUBBER WASHER



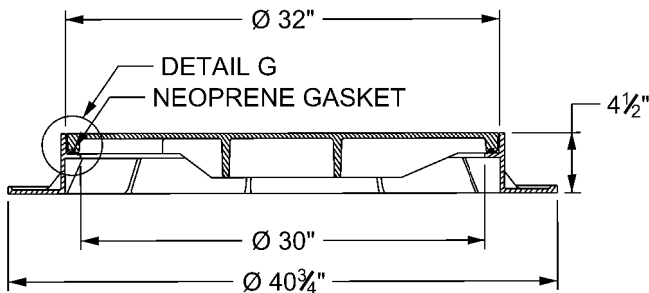
SECTION B-B (BOLTING DETAIL)



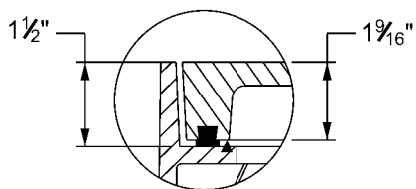
COVER IN 90° LOCKED POSITION



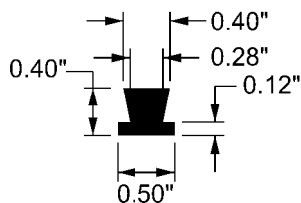
COVER IN 120° RESTING POSITION



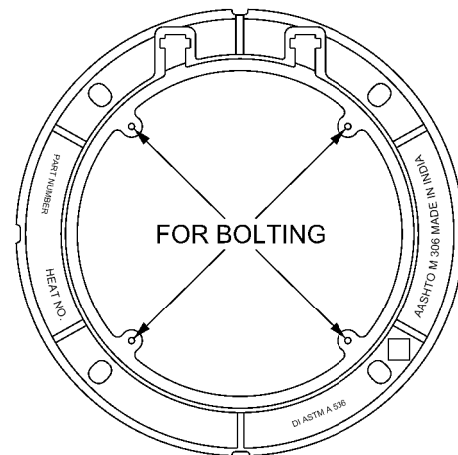
SECTION A-A



DETAIL G



NEOPRENE GASKET DETAIL



FRAME TOP VIEW

SIP Industries

PROPERTY OF
SAN ANTONIO WATER SYSTEM
SAN ANTONIO, TEXAS

30" MANHOLE RING
AND COVER DETAIL

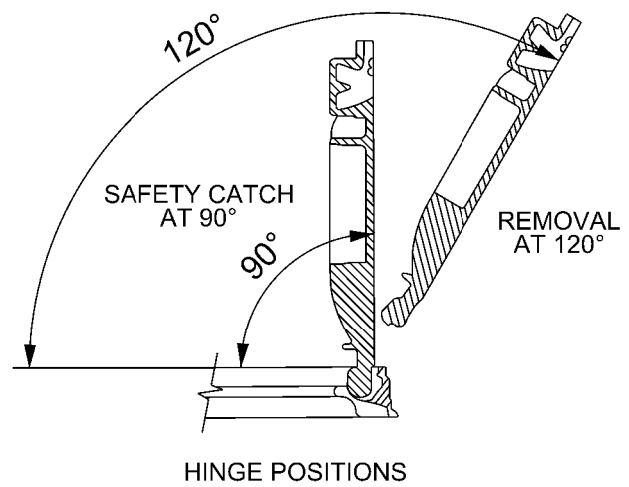
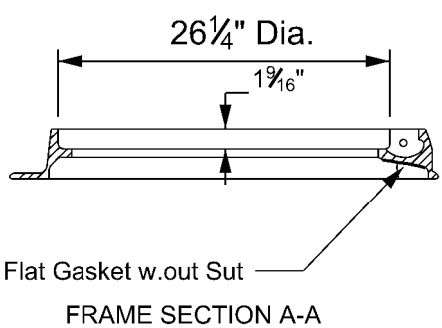
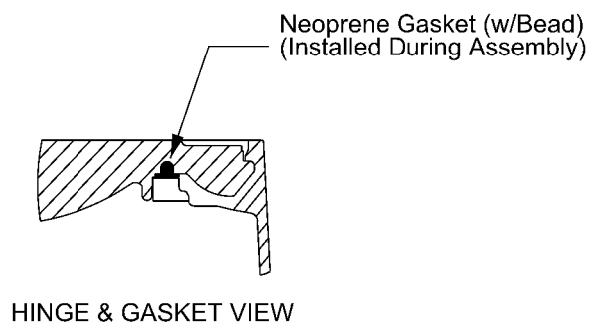
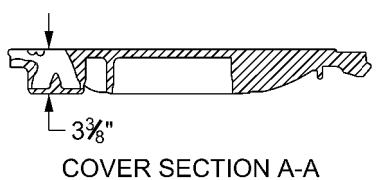
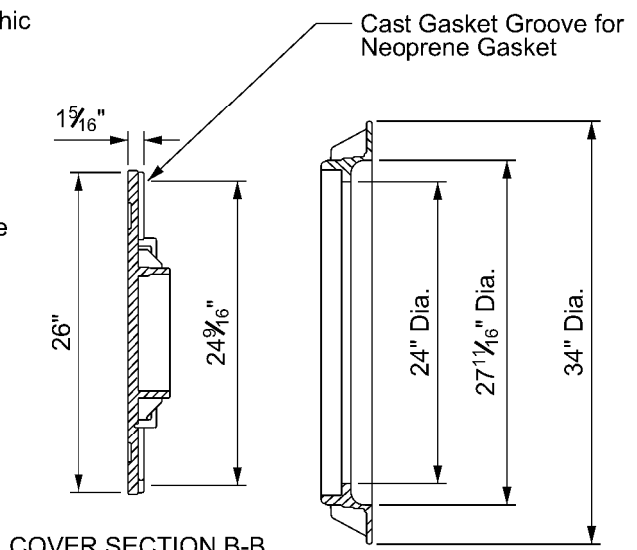
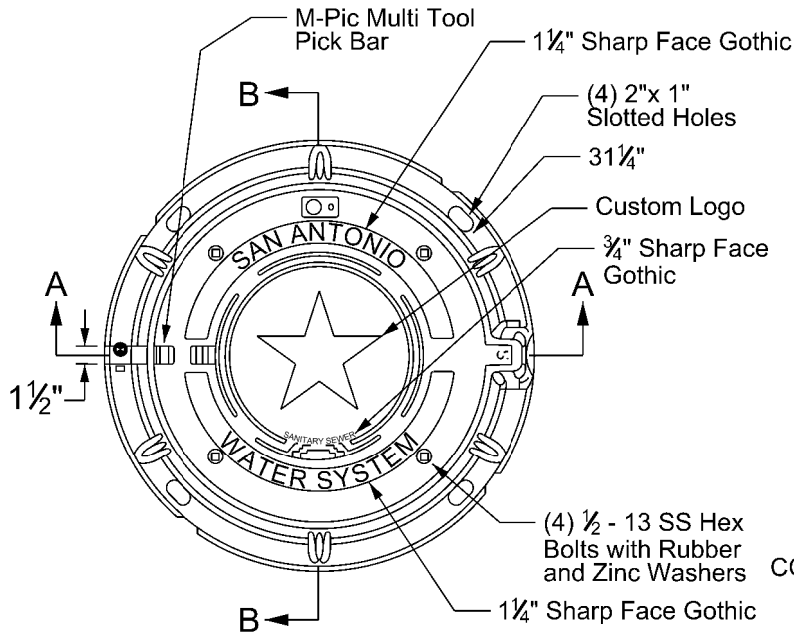
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1 OF 5



ERGO Assembly

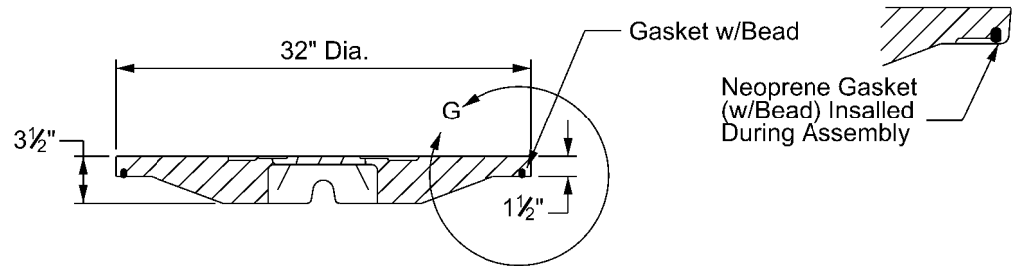
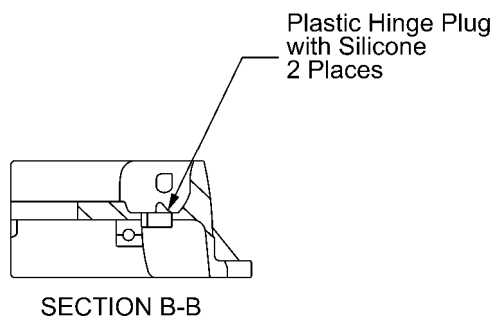
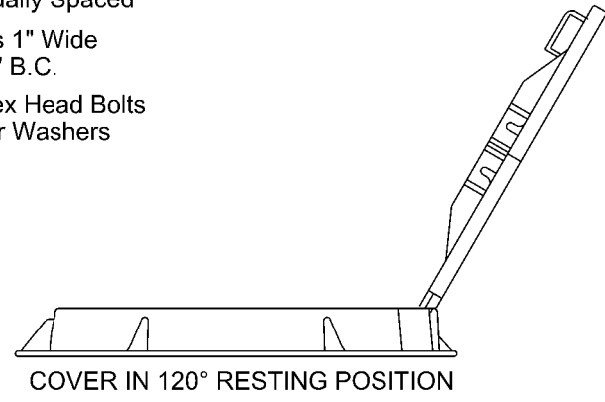
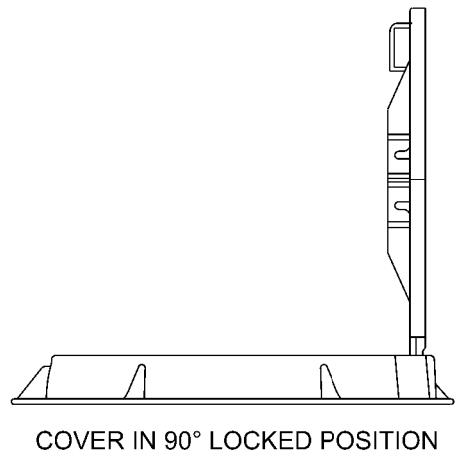
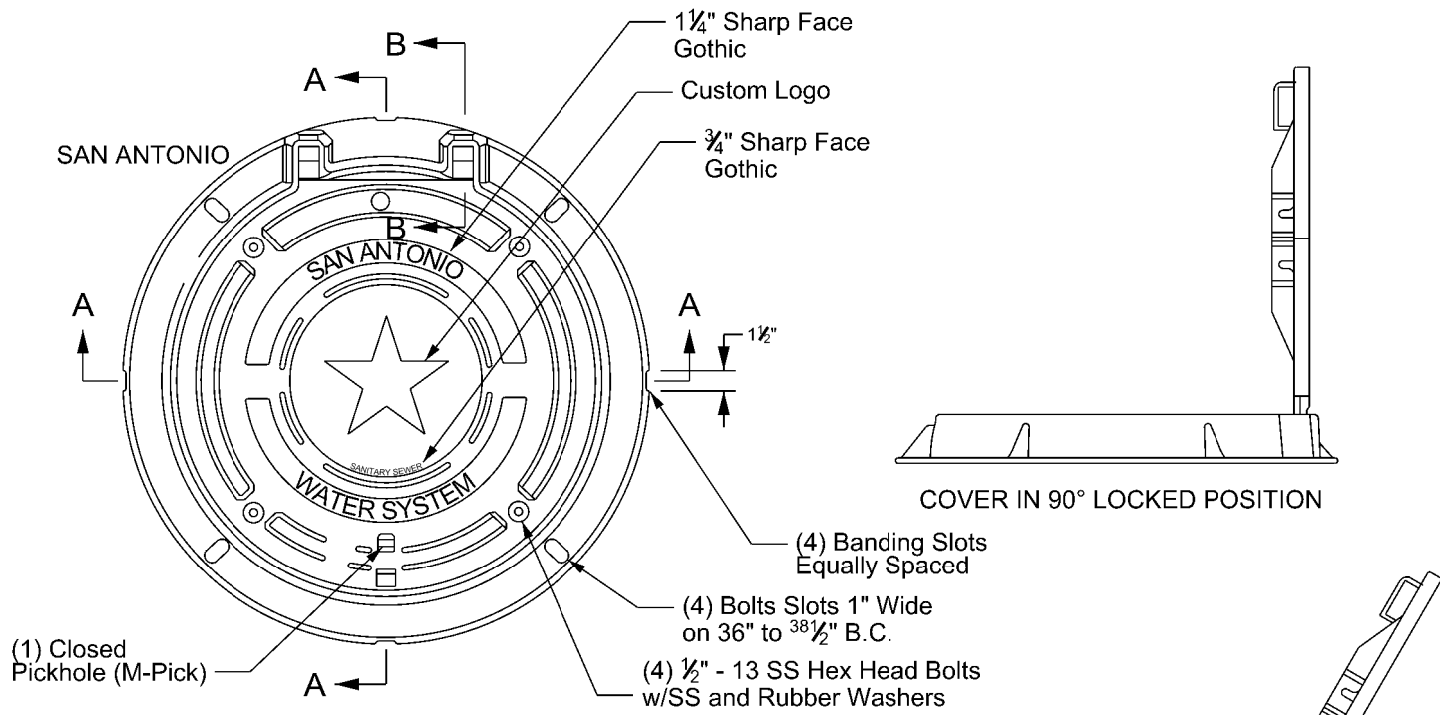
PROPERTY OF
SAN ANTONIO WATER SYSTEM
SAN ANTONIO, TEXAS

MANHOLE RING
AND COVER DETAIL

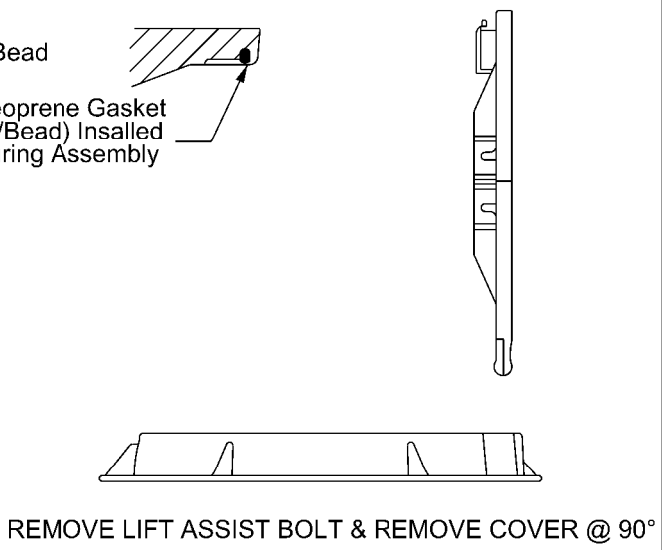
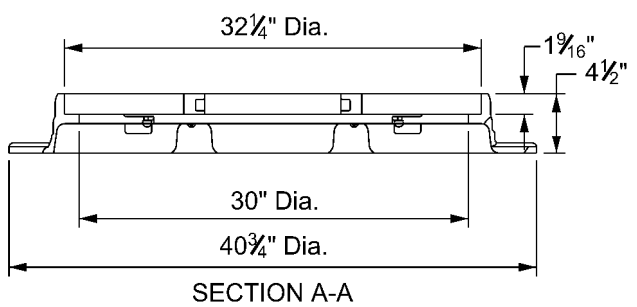
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| MARCH 2008 | AUG 2019 |

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2 OF 5

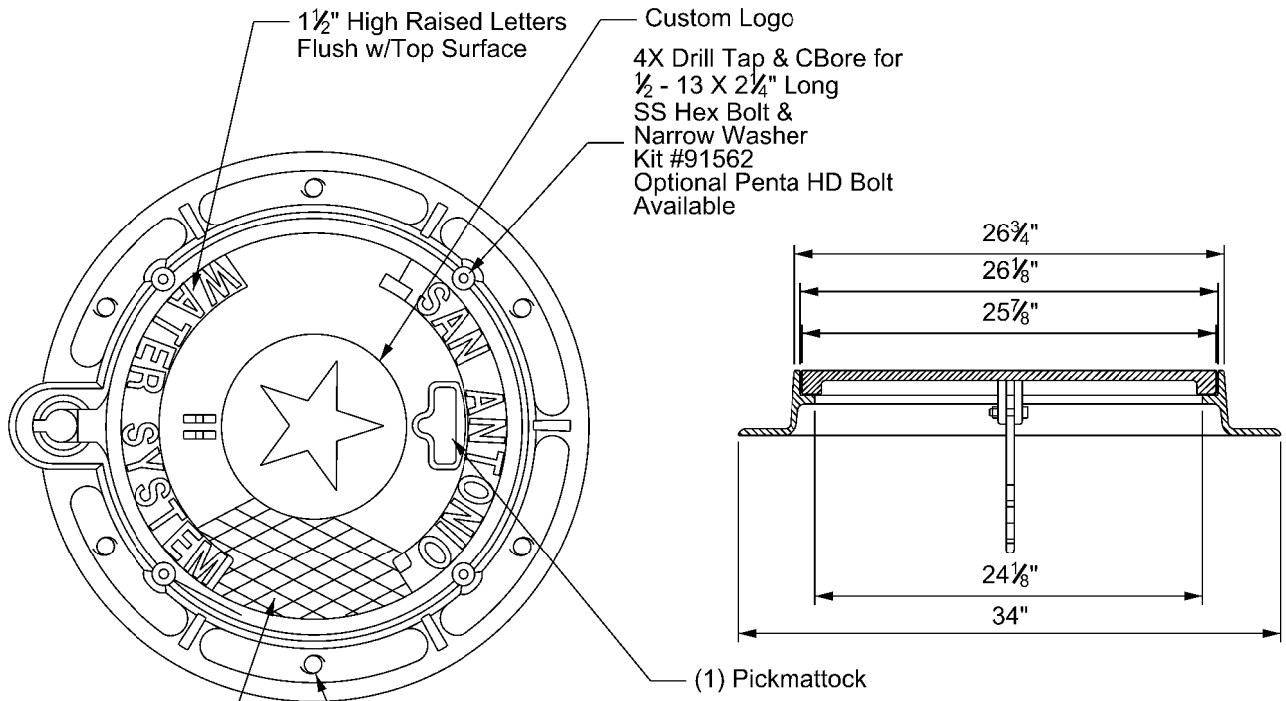


Gasket w/Bead
Neoprene Gasket (w/Bead) Installed During Assembly



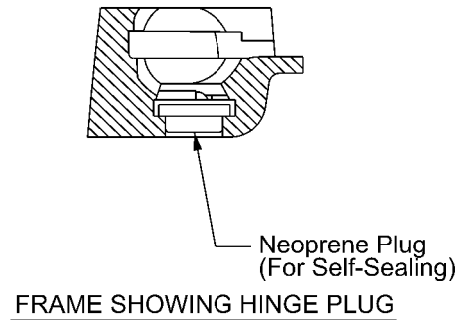
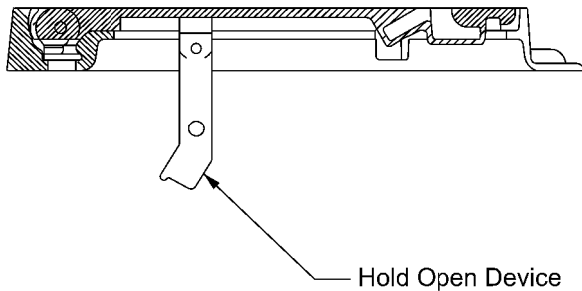
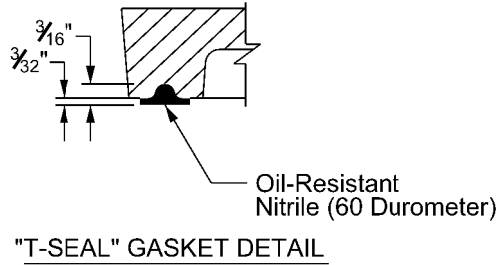
ERGO XL Assembly

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| PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS | MANHOLE RING AND COVER DETAIL | APPROVED MARCH 2008 | REVISED AUG 2019 |
| | | DD 852-07 | |
| | | SHEET 3 OF 5 | |



Type "C" Lid Design
w/Permagrip Texture

(6) 1 1/8" Dia. Anchor Bolt
Holes on a 29 1/16" Dia. B.C.



NEENAH FOUNDRY

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SAN ANTONIO, TEXAS

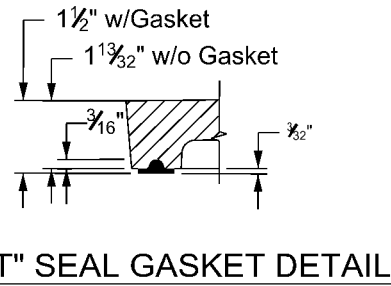
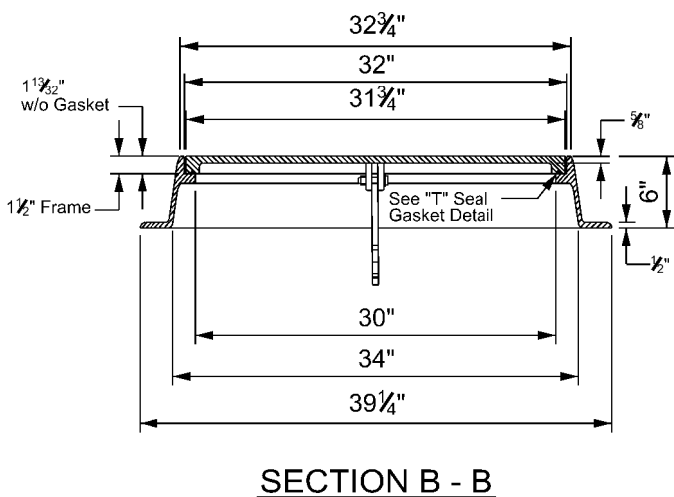
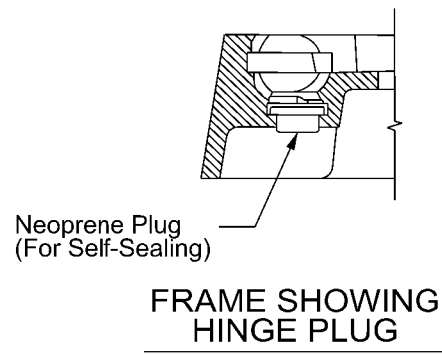
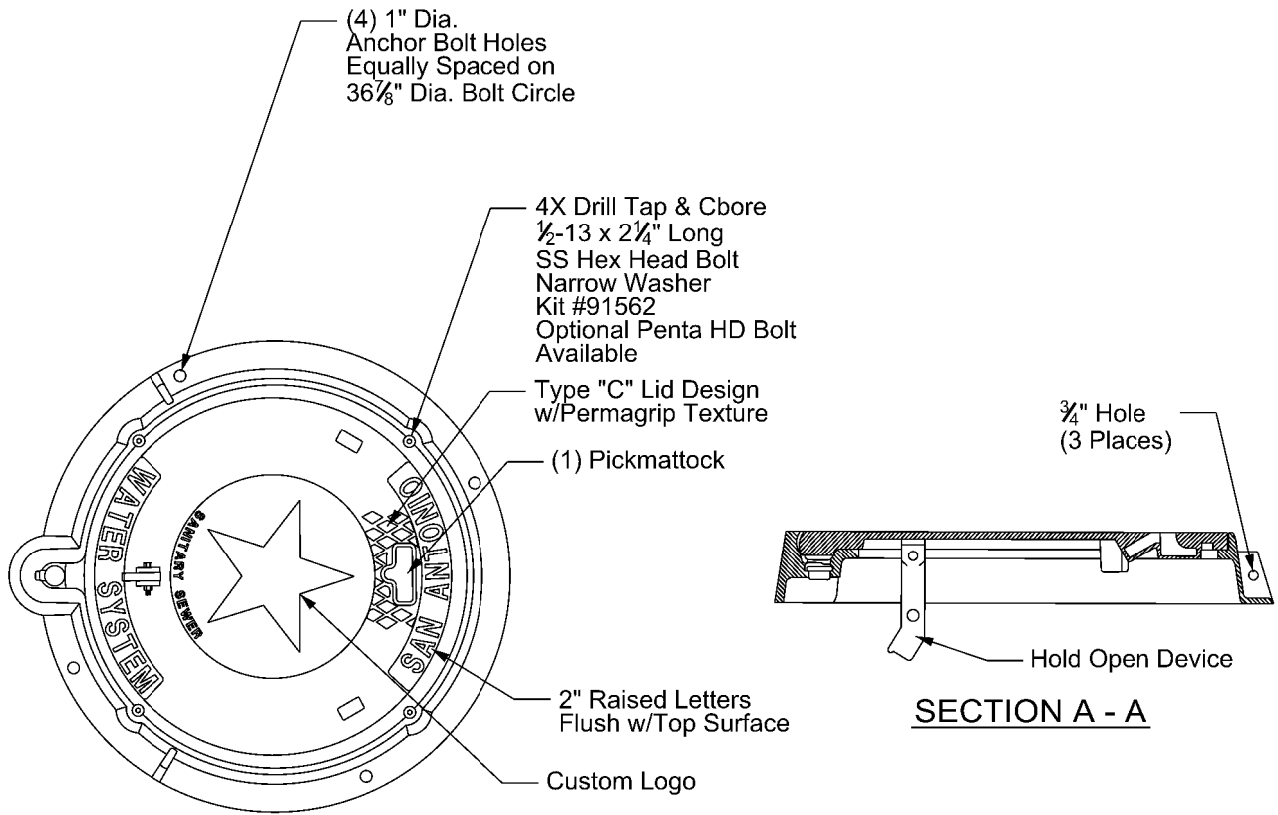
MANHOLE RING
AND COVER DETAIL

APPROVED
MARCH 2008

REVISED
AUG 2019

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NEENAH FOUNDRY

PROPERTY OF
SAN ANTONIO WATER SYSTEM
SAN ANTONIO, TEXAS

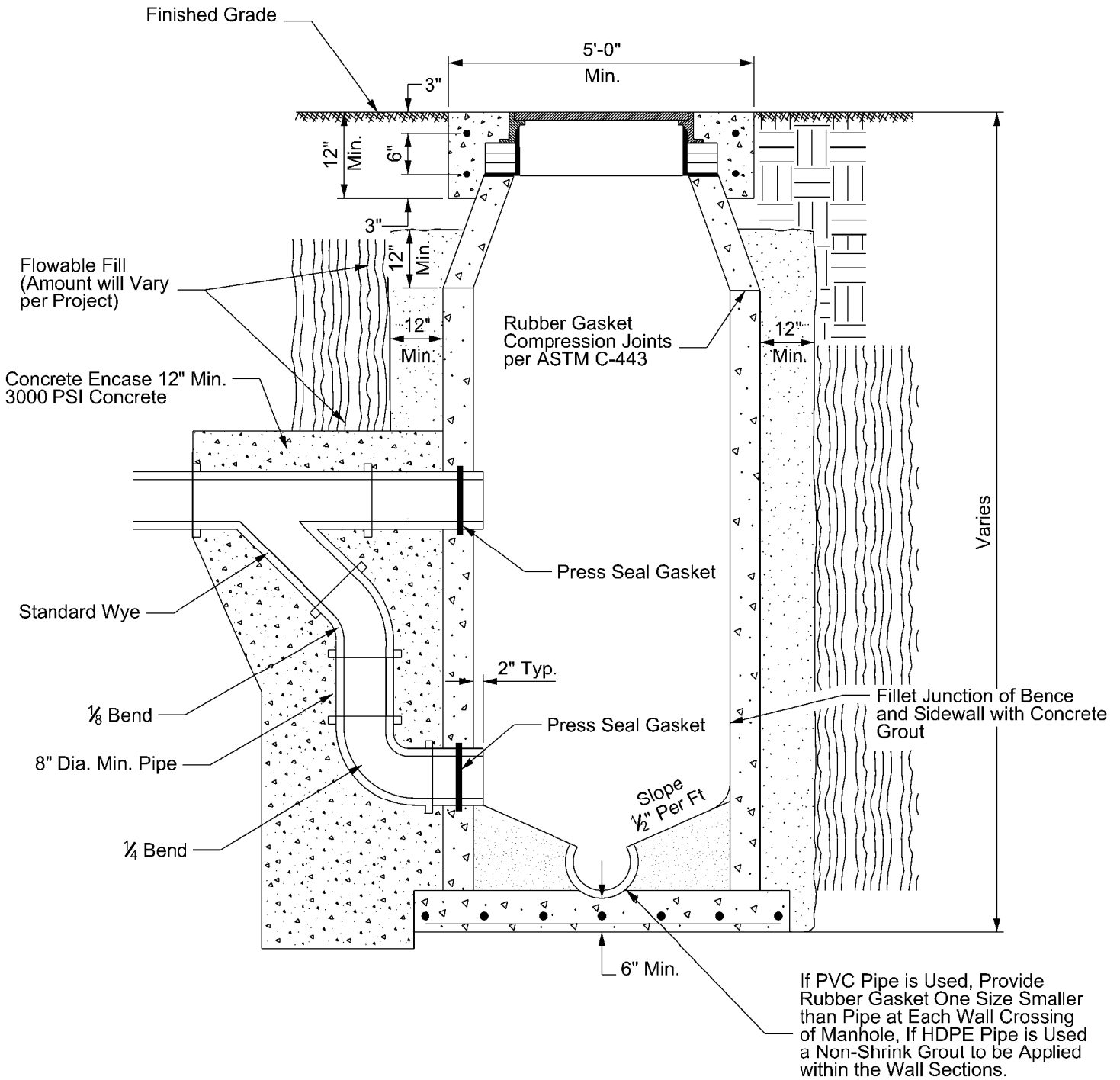
MANHOLE RING
AND COVER DETAIL

APPROVED
MARCH 2008

REVISED
AUG 2019

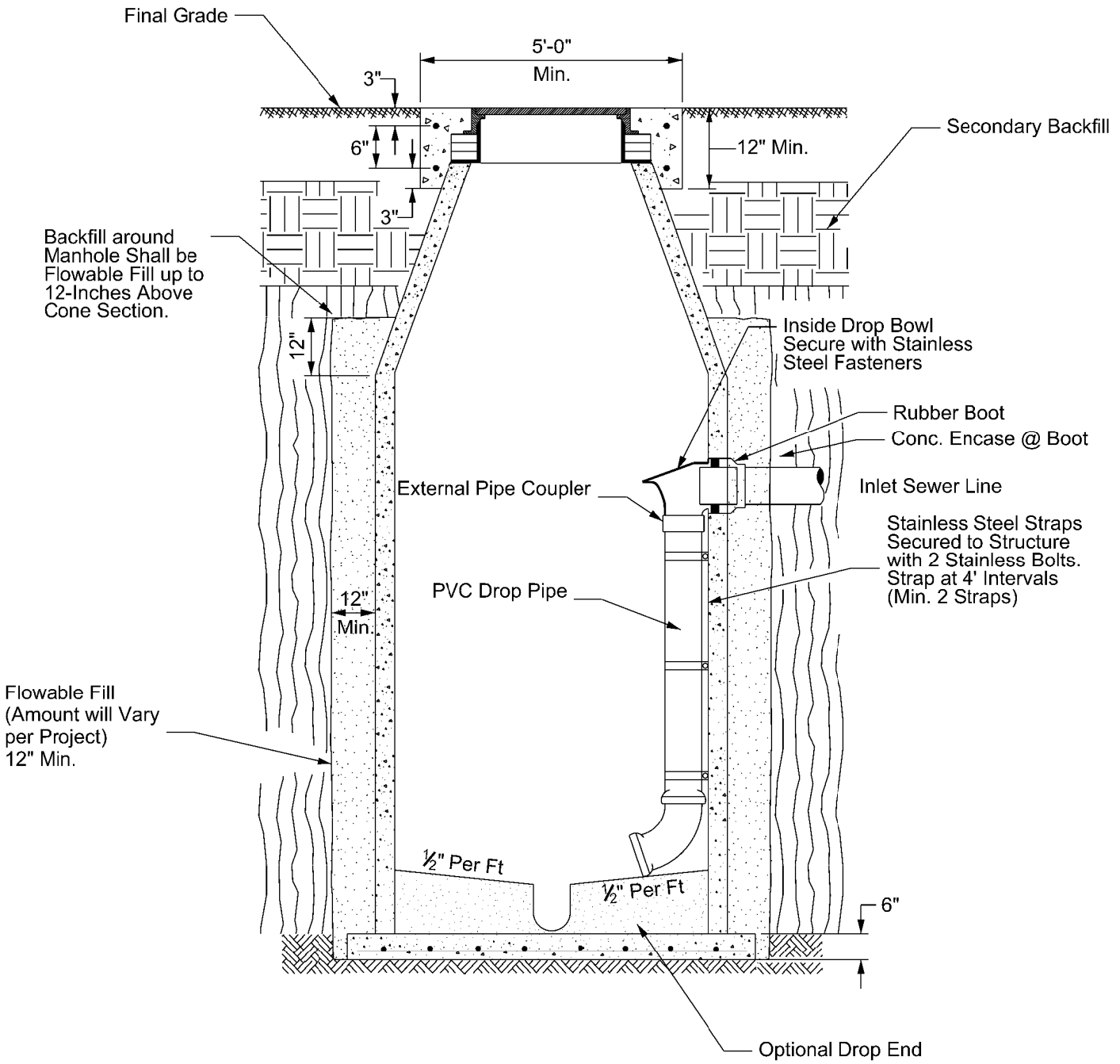
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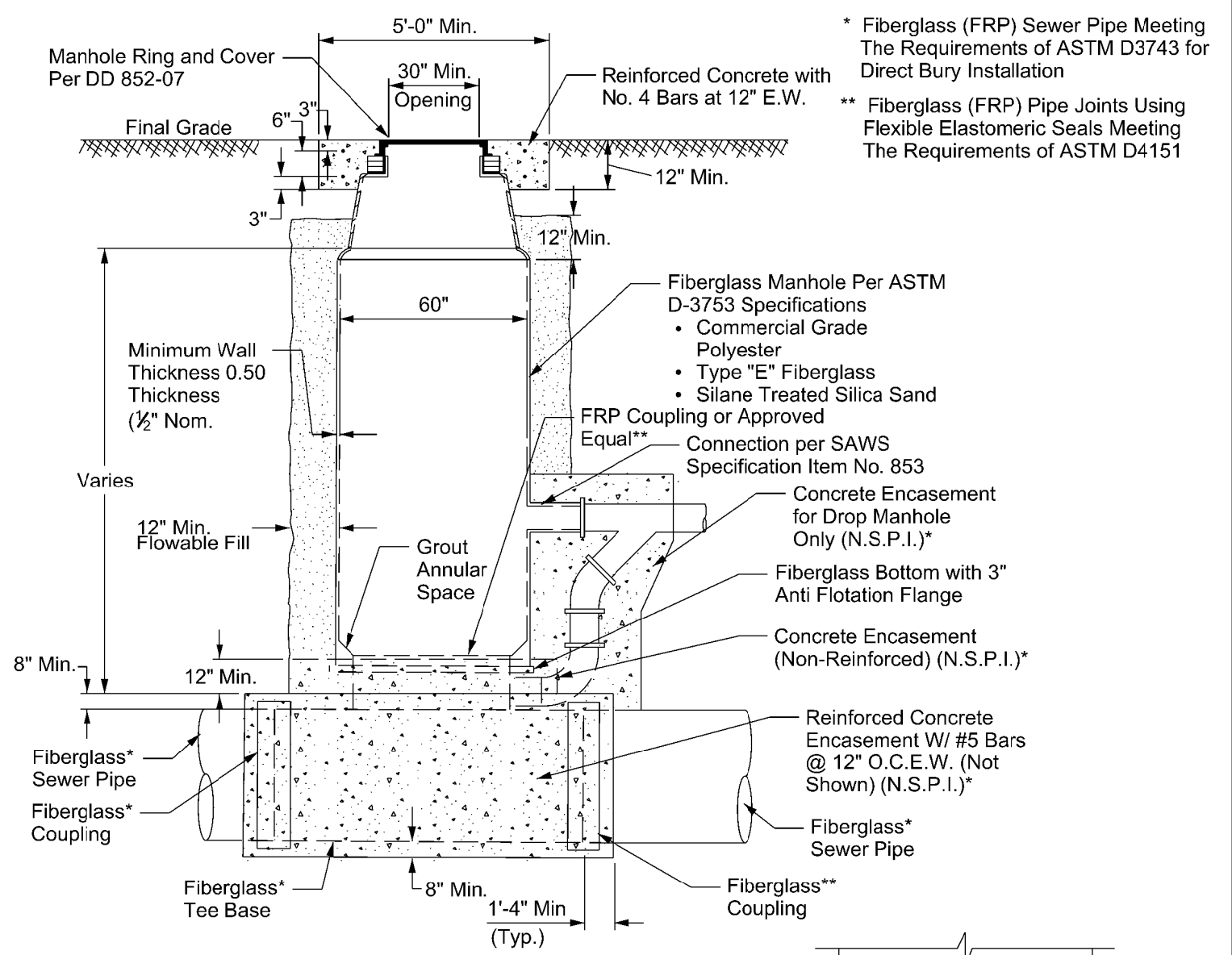
NOTE: Price for Drop Fittings and Encasement to be Included with the Price of Manhole.

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|---|---------------------|------------|-----------------|
| PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS | DROP MANHOLE DETAIL | APPROVED | REVISED |
| | | MARCH 2008 | AUG 2019 |
| DD-852-08 | | | SHEET 1 OF 1 |



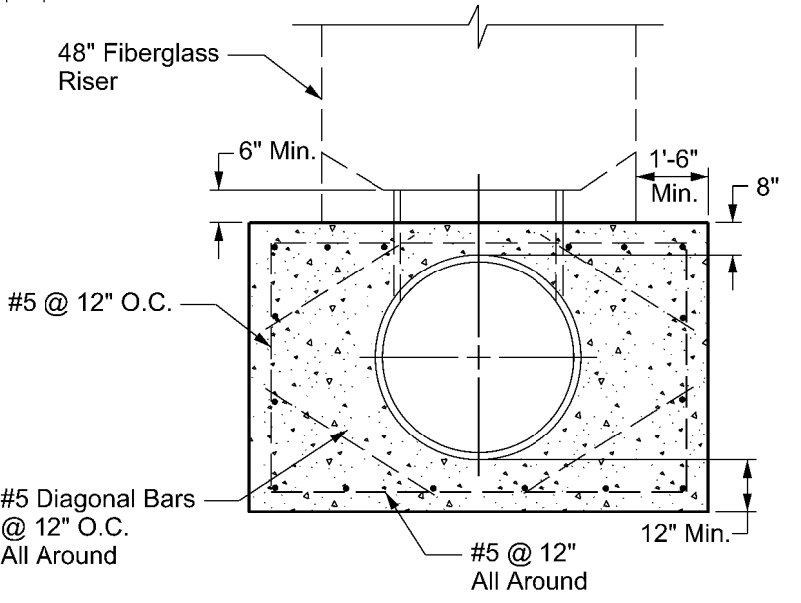
NOTE:
THIS MANHOLE IS TO BE APPROVED BY SAWS DIRECTOR OF ENGINEERING PRIOR TO CONSTRUCTION.

| | | | |
|---|-------------------------------|------------------|-------------------------------|
| PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS | MANHOLE INSIDE DROP SYSTEM | APPROVED | REVISED |
| | | SEPT 2018 | AUG 2019 |
| | | DD-852-09 | SHEET <u>1</u> OF <u>1</u> |



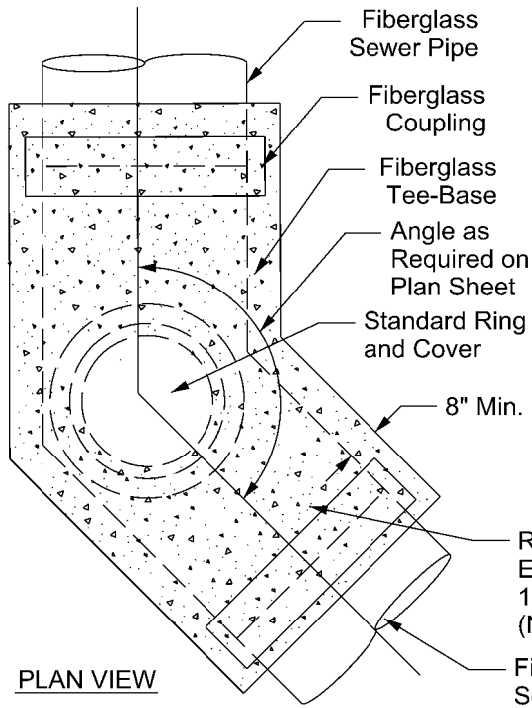
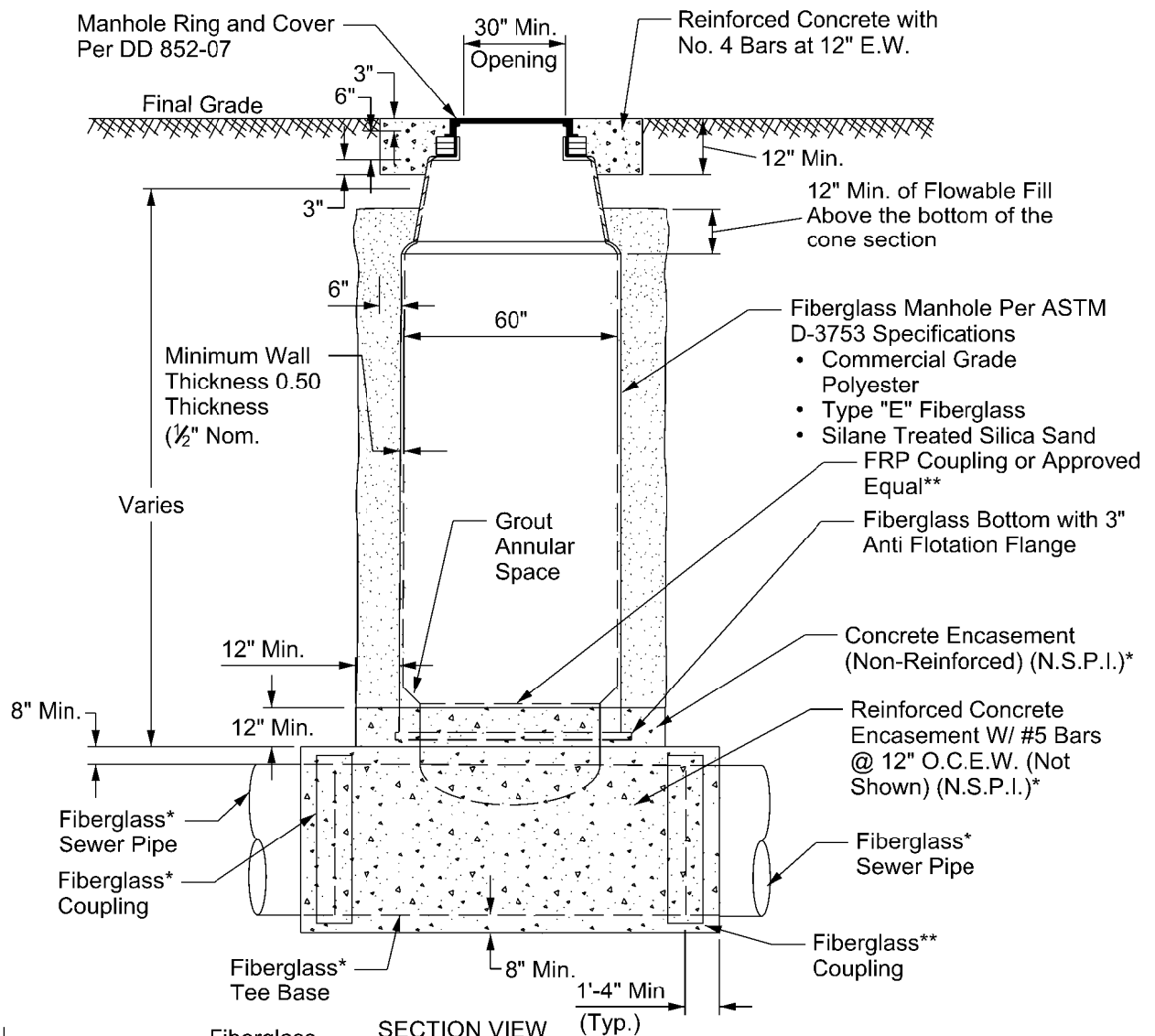
* Fiberglass (FRP) Sewer Pipe Meeting The Requirements of ASTM D3743 for Direct Bury Installation
 ** Fiberglass (FRP) Pipe Joints Using Flexible Elastomeric Seals Meeting The Requirements of ASTM D4151

- Notes:
1. Encasement to be Designed to Resist all Tee Base Deformations and is to Extend Past the First Joint on Either Side of the Tee Base by 1' to 3'
 2. All Concrete Encasement Required for Tee Base Manholes Shall be Considered Incidental to the Cost of the Manholes.
 3. Backfill Around Manhole Shall be Flowable (low Strength) with a Min. Thickness of 12-Inches and Fill Shall be Placed to within 12-Inches of Final Grade. This Cost Shall be Incidental to the Cost of the Manhole.
 4. Over Excavation within Areas for Placement of Sanitary Sewer Manholes and Structures Shall be Backfilled Per Detail This Sheet with Regards to Flowable Fill and ASTM D448 Aggregate. This Cost Shall be Incidental to the Cost of the Manhole or Structure.



TEE BASE CONCRETE REINFORCEMENT SECTION THROUGH PIPE

| | | | |
|---|-------------------------------------|------------------|-------------------------------|
| PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS | TEE-BASE FIBERGLASS DROP MANHOLE | APPROVED | REVISED |
| | | AUG 2019 | |
| | | DD-852-10 | SHEET <u>1</u> OF <u>1</u> |



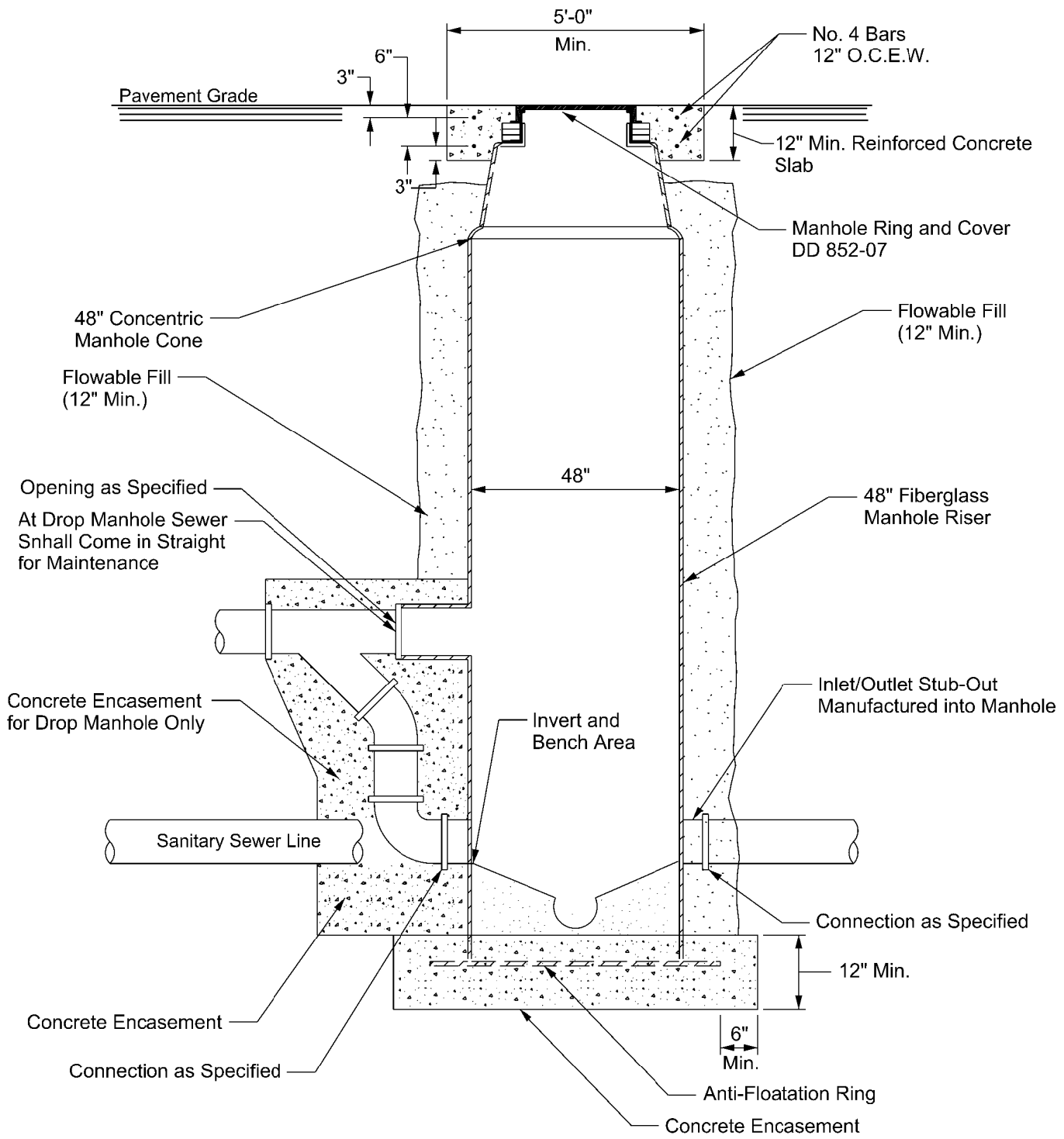
SECTION VIEW

Notes:

1. Encasement to be Designed to Resist all Tee Base Deformations and is to Extend Past the First Joint on Either Side of the Tee Base by 1' to 3'
2. All Concrete Encasement Required for Tee Base Manholes Shall be Considered Incidental to the Cost of the Manholes.
3. Backfill Around Manhole Shall be Flowable with a Min. Thickness of 12-Inches and Fill Shall be Placed to within 12-Inches of Final Grade. This Cost Shall be Incidental to the Cost of the Manhole.
4. Over Excavation within Areas for Placement of Sanitary Sewer Manholes and Structures Shall be Back filled Per Detail This Sheet with Regards to Flowable Fill and ASTM D448 Aggregate. This Cost Shall be Subsidiary to the Cost of the Manhole or Structure.

* Fiberglass (FRP) Sewer Pipe Meeting The Requirements of ASTM D3743 for Direct Bury Installation

** Fiberglass (FRP) Pipe Joints Using Flexible Elastomeric Seals Meeting The Requirements of ASTM D4151



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 SAN ANTONIO, TEXAS

**TYPICAL FIBERGLASS
 MANHOLE DETAIL**

APPROVED
 AUG 2019

REVISED

DD-852-12

SHEET
1 OF 1

ITEM NO. 865

**Bypass Pumping
Small Diameter Sanitary Sewer Mains**

865.1 DESCRIPTION: The work covered by this item consists of bypass pumping operations for existing sanitary sewers less than 24-inches in diameter in order to temporarily reroute sanitary sewer flows to prevent a sanitary sewage overflow (SSO) and to provide adequate and reliable sanitary sewer flow at all times during construction, while the tasked scope of work is executed.

1. The work also covered in this item is for the use of inflatable and mechanical pipe plugs.
2. The use of inflatable/mechanical plugs in the water and sewer industry is the standard method to temporarily plug a pipe where permanent flow control devices are not available or are not operating as designed.
3. An inherent danger exists with all inflatable products.
4. If any conditions with this equipment exist that may jeopardize the safety of workers or others, do not use it.
5. This item includes all requirements for implementing a temporary pumping system for the purpose of diverting sanitary sewage flow around any construction-related activity to an approved reintroduction point within the sanitary sewer system.
6. The Contractor shall minimize the health, safety, and regulatory risks by taking all reasonable measures to avoid an SSO.
7. All bypass systems shall comply with all the requirements of this section unless specifically noted otherwise.
8. The Contractor shall be responsible for the design of the bypass pumping plan and system. Contractor's bypass pumping system design shall be developed based upon the requirements of the Contract Documents.
9. Contractor's bypass pumping system design shall be developed based upon full pipe flow using a Manning Roughness coefficient of 0.013.
10. The bypass system shall meet the requirements of all codes and regulatory agencies having jurisdiction
11. Pump and haul bypass systems shall not be allowed within the Edwards Aquifer Recharge Zone (EARZ) or for larger sanitary sewers with significant sewage bypass flows.
12. Contractor shall provide for temporary measures to convey sewage flows and avoid sewage spills should a storm event occur that generates sanitary sewer flows in excess of Contractor's bypass pumping system.

865.2 REFERENCE STANDARDS: Reference standards cited in this Specification Item No. 865 refer to the current reference standard published at the time of the latest revision date.

1. San Antonio Water System (SAWS):
 - a. Specifications for Water and Sanitary Sewer Construction (2014)
 - b. SAWS Materials Specifications

San Antonio Water System Standard Specifications for Construction

2. City Of San Antonio (COSA) Standard Specifications for Construction
3. Texas Commission of Environmental Quality
 - a. TCEQ under 30 TAC Chapter 312, Subchapter G
 - b. Edwards Aquifer Recharge Zone (30 TCEQ § 213).
4. American Concrete Pipe Association
 - a. Concrete Pipe Design Manual

865.3 SUBMITTALS:

1. All submittals shall be in accordance with Engineer's requirements. All submittals shall be approved by the Engineer prior to delivery of materials and commencing any portion of the proposed scope of work.
2. For all projects requiring bypass pumping, the Contractor shall prepare and submit a Bypass Pumping Plan (BPP).
 - a. The BPP shall be submitted a minimum of (2) two weeks prior to commencing any portion of the proposed scope of work and shall be approved by the Engineer prior to beginning Work.
 - b. The BPP shall be signed and sealed by a professional engineer licensed in the State of Texas (Contractor's Engineer).
3. Contractor shall submit manufacturer's product data, instructions, recommendations, shop drawings, and necessary certifications in order for the proposed BPP to be reviewed and approved.
4. The following shall be submitted as part of the BPP:
 - a. A cover letter containing the following information;
 - i. The project name and job number.
 - ii. The name and address of the Contractor.
 - iii. Contact information of the Contractor's project manager, superintendent, foreman/supervisor, safety professional, etc.
 - iv. Resumes for qualified pump personnel and supervisors
 - v. A description and location of the planned bypass pumping work to be performed; include data for stationary and pump and haul bypass systems as applicable.
 - b. Emergency (24 hrs/day, 7 days/week) contact information for the bypass pumping subcontractor, if applicable. Make sure to include the name, cell phone number, and title of the person(s) onsite responsible for the bypass pumping operation.
 - c. The name, phone number, title, signature, and PE seal of the Contractor's Engineer preparing the BPP.
 - d. Copies of permits or other documents showing the Contractor has obtained all clearances necessary for installation and operation of the BPP.
 - e. If Contractor elects to use a combination of stationary bypass pumping and pump and haul for his bypass system, Contractor's BPP shall identify the quantity of flows that will be pumped and pumped and hauled for each type of bypass system along with the points where flows will be removed and reintroduced into the sanitary sewer system.

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- f. Certificate of Compliance that the BPP complies with all SAWS and regulatory requirements and that all components have been designed by a professional engineer licensed in the State of Texas.
- g. The Contractor's Engineer shall review all components of the submitted BPP for adequacy to the Contractor's selected design flow conditions and insure that all bypass pumping system components are of adequate size, strength, meet the reliability criteria specified herein.
- h. A description of the maximum amount of sanitary sewer flows to be bypassed by the Contractor's bypass pumping system and how the flow conditions will be monitored during system operations (including all flow measurement devices, calculations, equipment, or other sources of how data was obtained).
- i. Descriptions of all proposed bypass pumping components to be used.
- j. If applicable, describe all different bypass pumping phases.
 - i. Include bypass pump(s) size(s) and capacity, as well as the size(s) and capacity of the suction/discharge piping.
 - ii. The description shall also include manhole(s)/structure(s) depth(s) and size(s) that will be used during the bypass pumping operation, sanitary sewer plugging method and type of plugs to be used, flowmeter installation locations, etc.
- k. All plugs are required, submit a Plug Use Plan (PUP) according to the requirements of to this specification.
 - i. Contractor shall provide SAWS with adequate prior notification to allow SAWS to witness installation and removal of all plugs.
 - ii. Description of procedure for locating and recovering any lost plug.
- l. Description of minimum equipment on hand should an emergency plan be implemented, i.e. spare pump, emergency generator.
- m. The date and time the bypass pumping is expected to begin and be completed. Indicate if bypass pumping will take place outside normal work hours which are between 8 am to 5 pm Mondays through Fridays (except for SAWS observed holidays).
- n. The pump curves, showing operating range. This shall include the proposed system curve, addressing the pump operation in relation to the suction/discharge piping's alignment with respect to restriction and/or elevations.
- o. Suction and discharge piping material(s) and capacity to be used for the bypass pumping operation, including the material(s) for any bend(s) and/or valve(s) that will be used.
- p. Sound attenuated pumps are required at all sites.
- q. A sketch showing the location of the pump(s) and the route of the suction, discharge, and diversion piping.
- r. If Contractor elects to use locations outside of the easements obtained by SAWS or locations that are not indicated for use on the BPP plan sheet, Contractor shall be solely responsible for obtaining the required easements and written documentation required for use of these locations, a copy shall be provided to SAWS prior to Contractor's use.

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- s. A sketch detailing proposed restoration of the suction and discharge points if the Contractor proposed to make openings in the existing pipes or structures.
 - i. If different than shown in contract documents, the new sketch shall be dimensioned and all-inclusive showing all SAWS manhole numbers that will be used for suction and discharge operations.
 - ii. If any other structure will be used for suction and/or discharge operations, then the nearest manhole(s) shall be labeled.
 - iii. The sketch shall include the name of any streets and/or major intersection in the area. All features possibly affected by the alignment of the BPP's components (driveways, vehicular traffic, residential or commercial dwellings (due to noise)) shall likewise be addressed.
- t. For pump and haul systems the sketch shall show the location of all system components along with the staging areas, haul routes, and an explanation of the expected cycle time of all aspects of the operation.
- u. Clear photographs of the manhole(s) interior that will be used for the bypass pumping operation, including pole camera photographs of pipes where plugs will be installed.
 - i. All photographs will be labeled with the manhole number, date, and intended use of the manhole by the Contractor's BPP.
- v. A Traffic Control Plan that pertains solely to the bypass pumping operations. This may differ than the project's traffic control plan for the overall scope of work.
 - i. The Traffic Control Plan shall include all required permits including street cut permits.
- w. Contractor shall maintain pedestrian and vehicular traffic and comply with ADA regulations for access to all residential and commercial property unless written approval is otherwise obtained from the property owner allowing for reduced access.
- x. An Emergency Plan detailing procedures to be followed in the event any portion of the bypass operation fails and causes either surcharging or an actual SSO. A sanitary sewer surcharge is herein defined as any flows entering the manhole or structure (above the crown of the pipe). Contractor is herein advised that:
 - i. The existing sanitary sewer system may surcharge during certain storm events. The Contractor's BPP must recognize this potential and accommodate it with sufficient bypass capacity, restoration of flow through the sanitary sewer system, or other measures acceptable to SAWS during these flow events. These measures shall be included in the submitted BPP.
 - ii. The Contractor's BPP cannot cause any surcharging that results in damage or SSOs.
 - iii. Any damage or SSOs during bypass pumping operations resulting from Contractor's bypass system shall be deemed a failure of BPP, and the Contractor must re-propose an improvement to their BPP for review and approved. Contractor shall be fully responsible for all

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- damages and costs related to the installation, operation, and maintenance of Contractor's bypass pumping operations including damages, clean up, fines, penalties, and other related costs.
- iv. Contractor to include minimum equipment on hand for implementing and emergency plan. (i.e. spare pump, emergency power source.)
 - y. Where bypass piping is installed within the floodplain of waterways subject to flooding, the Contractor shall submit an anchorage plan and calculations to ensure that piping is properly anchored.
 - z. The pipe shall be capable of remaining in place during a 100-year storm event.
 - aa. Anchorage plan and calculations shall be designed and sealed by a professional engineer licensed in the State of Texas (Contractor's Engineer). This shall be the same PE that sealed the BPP Certificate of Compliance.
 - bb. For pump and haul system, submit copy of Hauler's Transporter Registration as issued by TCEQ under 30 TAC Chapter 312, Subchapter G.
 - cc. For pump and haul system, submit information on licensed disposal site to be used by the Contractor
 - dd. Submit the checklist found at the end of this document confirming that all items required by this section are included in the BPP submittal.
 - ee. For all projects requiring the use of pipe plugs on pipes the Contractor shall furnish a submittal containing manufacturer's product data, instructions, recommendations and a project PUP. The PUP shall be submitted and approved by the SAWS engineer a minimum of (2) two weeks prior to commencing any portion of the proposed scope of work.

The following shall be submitted with the PUP:

- i. A cover letter containing the following information;
 - a) The project name and job number;
 - b) The name and address of the Contractor
 - c) Contact information of the Contractor's project manager, superintendent, foreman/supervisor, safety professional, etc.
 - d) Emergency (24 hrs/day, 7 days/week) contact information for the staff responsible for operating and maintaining the plug. Include the name, phone number, email address and the person(s) onsite who is responsible for the project.
 - e) The name and contact information for the PUP preparer.
- ii. Plug Plan
 - a) The plan shall show where on the project site the Contractor intends to use pipe plugs, including:
 - b) manhole numbers;
 - c) the upstream and downstream pipe diameters and pipe materials;
 - d) pipe slopes;
 - e) pipe depth;
 - f) pipe flow direction;
 - g) known peak or surcharge flow data;
 - h) types of plugs to be used;

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- i) types of restraint used;
- j) type of radio transmitting device.
- k) flow monitoring system plan
- l) airline regulator and gauge location
- iii. Calculations
 - a) Provide calculations of the maximum anticipated head pressure on the plug and the resultant tensile force required to restrain the plug prior to plug inflation and during plug removal.
 - b) Provide calculations of the required inflation pressure of the plug.
 - c) Calculations shall be sealed and signed by a professional engineer licensed in the state of Texas in civil or mechanical engineering, representing plug manufacturer.
- iv. Plug selection
 - a) Detail the plug selection for each installation including given conditions, pipe size and anticipated pressure requirements. Include in plan sleeves that will be used.
- v. Plug inspection:
 - a) Provide a manufacturer's inspection form detailing recommendations for plug inspection of plug condition before and after use; form to be signed by Contractor staff responsible for plug installation prior to and after plug installation.
- vi. Monitoring plan
 - a) Provide a monitoring plan for observing the plug inflation pressure gauge and hoses. Monitoring shall be for 24-hours per day during the plug use duration.
 - b) Provide a written response plan for when the plug loses pressure.
 - c) Provide a plug retrieval plan.
- vii. Plug restraint details
 - a) Provide means and methods for anchoring, support, and bracing appropriate for anticipated operating pressure conditions
 - b) Size restraint (cable or chain) based on calculated loads using a safety factor of 4.
 - c) Eye bolts to be $\frac{3}{4}$ inch min galvanized steel.
 - d) Provide multiple tie-off locations for chain or wire cable restraint, greater than or equal to calculated loads using a safety factor of 4 or greater. Tie off locations cannot be located on private property.
 - e) Rope of any kind is not an acceptable material for plug restraint.
 - f) Manufacturer's Literature
- ff. Provide manufacturer's literature on proper plug use and safety precautions, including available on-line training.

865.4 EQUIPMENT AND MATERIALS: The Contractor shall provide all necessary pumping equipment, piping and all other necessary appurtenances in order to maintain a reliable sanitary sewer flow in the sanitary sewer system (including any temporary manholes) at all

San Antonio Water System Standard Specifications for Construction

times during construction for stationary pumping and pump and haul bypass pumping systems. For 8” and 12” sanitary sewer mains which flow level is less than one half of the pipe diameter a float monitoring system or radio transmitter will not be required. All materials, equipment, etc., must be in good condition, and shall not have visible damage such as cracks, holes, foreign material, blisters, etc.

1. Plugs: Plugs must be selected and installed according to the size of the line to be plugged.
 - a. Plugs shall be secured and anchored to prevent plug movement or escape into the adjoining sanitary sewers should the plug fail.
 - b. All plugs shall be equipped with a radio transmitter that will be used to locate any plug that has escaped in the adjacent system.
 - c. The radio transmitter shall be designed for environment that it will be installed.
 - d. The Contractor shall also provide and keep on site the matching radio receiver that will be used to locate any plug that is lost in the adjacent system.
 - e. Plugs will be in good condition and reviewed by the Contractor for defects that might lead to failure prior to being installed.
 - f. The Contractor shall provide and sign a Plug Inspection form verifying plugs have been inspected.
 - g. All plugs shall include a non-corrosive/non-plastic name plate permanently anchored to both ends of the plug.
 - h. Name plate shall include SAWS Job No. permanently stamped, engraved or welded on the name plate with a minimum of 1 inch tall legible lettering.
 - i. Airline regulator and gauge shall be located outside excavation and shall be secured and anchored. Location shall be shown on the PUP.
 - j. An additional plug (for each size of plug used) must be onsite and ready to be installed in the event a plug fails or becomes dislodged. Plug(s) will be reviewed by the Inspector and/or Engineer for defects that might lead to failure prior to being installed.
 - k. Contractor shall immediately locate and remove any plug that has shifted its position, slipped within the pipe, dislodged, moved, or otherwise provided an indication that its suitability for use in plugging may be suspect or compromised.
 - l. Contractor shall immediately notify SAWS of any plug that has provided an indication that its suitability for use in plugging may be suspect or compromised and allow SAWS to observe plug removal and replacement.
 - m. It is also imperative that the Contractor notify the Inspector at the completion of the work. In order to verify that all plugs have been removed from the system, Contractor shall only do so in the presence of the Inspector.
 - n. The Contractor shall provide all necessary equipment, plugs, hoses, gauges and necessary appurtenances to install the plug, maintain the plug during use and remove the plug at completion.
 - o. All plugs must be in good condition, and shall not have visible damage such as cracks, holes, tears, cuts, punctures, abrasions, loose or damaged

San Antonio Water System Standard Specifications for Construction

- fittings, cracks in castings and excessive wear.
 - p. All plugs 24-inches and larger shall have an air release valve for rupture protection.
 - q. All plugs shall be equipped with a radio transmitter locating device that is activated by the plug losing air pressure. The locating transmitter device shall be effective to a depth of 65 feet, and have a battery life of 1,000 hours when operated in pulse mode after activation.
 - r. All plugs shall have a protective sleeve.
 - s. If the plug is damaged, do not use the plug and remove it from the job site.
 - t. Contractor must be aware of the limitations associated with plugs..
2. Stationary Bypass Pumping Systems
- a. High-Density Polyethylene (HDPE) is the preferred pipe material for all bypass piping.
 - b. HDPE shall be used when bypass discharge pipe will be going through streams, storm water culverts, the Edward's Aquifer Recharge Zone, and/or environmentally sensitive areas.
 - c. At other locations, not within the Edward's Aquifer Recharge Zone, flexible discharge hose that is in good condition and does not leak, may be allowed subject to it acceptably passing testing.
 - d. HDPE pipe must be assembled and joined using fused couplings, fused flanges or fusion welding in order to avoid joint leakage. SAWS shall be notified in sufficient time to allow them to inspect the pipe joints during assembly. SAWS shall be notified a minimum of 48 hours in advance of all fusing/joining operations.
 - e. HDPE fusion welding must be performed by personnel certified as fusion technician(s) by the manufacturer of HDPE pipe and/or fusing equipment. SAWS shall examine welds prior to use in BPP operation.
 - f. BPP shall indicate the proposed DR of the pipe to be used.
 - g. Rigid suction hose that is in good condition and does not leak may be allowed for withdrawal of flows from the suction point into the bypass pumps.
 - h. Pipe material other than HDPE shall be submitted to the Engineer for approval. Neither "Irrigation type" pipe nor glued PVC pipe will be permitted.
 - i. Any hoses or pipes that leak shall be removed and replaced with non-leaking hoses or pipes.
 - j. Pumps must be fully automatic self-priming units that do not require the use of foot valves or vacuum pumps to prime the system.
 - k. No electric pumps will be allowed; all pumps must be diesel powered. Contractor shall provide suitable spill control and containment measures to avoid environmental contamination by pumps, fuels, or lubricants.
 - l. All pumps shall be open impeller solids handling type pumps, capable of passing a minimum of 3-inch diameter solids.

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- m. Contractor shall have one backup pump, equal in capacity to the largest pump in the system, connected into the bypass pumping system, and ready for operation in case any of the primary pumps fail.
 - n. The backup pump shall not be used in Contractor's calculations for determining the pumping capacity requirements for the stated flow conditions above.
 - o. Sound-attenuated pump enclosures shall be required on all projects where the bypass pumps are required.
 - p. Contractor shall provide sufficient sound attention measures to comply with City of San Antonio noise limitation requirements.
3. Pump and Haul Bypass Pumping Systems
- a. Pump and haul bypass pumping systems shall use good-quality vacuum trucks, equipment, and materials from manufacturers commonly engaged in the manufacture, service, and repair of these types of sanitary sewer service trucks and equipment.
 - b. All equipment shall be designed and manufactured for sanitary sewer service, shall function acceptably, be reliable, and free from leaks or other deleterious environmental impacts.
 - c. All equipment proposed for use in pump and haul bypass pumping shall have been maintained per the manufacture's recommendations.
 - d. Equipment service records shall be made available at SAWS request.
 - e. Any hoses or pipes that leak shall be removed and replaced with non-leaking hoses or pipes.

865.5 CONSTRUCTION: During construction, it will be the Contractor's responsibility to maintain a safe and secure environment at all times.

- 1. All provisions and/or requirements of the BPP must be followed throughout the course of any bypass flow operations.
- 2. Contractor must notify the SAWS' Inspections Department 72 hours prior to commencing the bypass pumping operations.
- 3. SAWS requires the Contractor to manage the flow of wastewater in a planned and proactive manner.
- 4. Contractor shall be fully responsible for all damages and costs related to the installation, modification of existing manholes/structures, operation, and maintenance of Contractor's bypass pumping operations including damages, clean up, fines, penalties, and other related costs.
- 5. Bypass pumping systems shall be stationary systems consisting of portable pumps, piping, and appurtenances unless a "pump and haul" bypass system is accepted by SAWS.
- 6. Pump and haul bypass systems can use a relay system of vacuum trucks using a pump and haul approach to bypass sewage flows.
- 7. Where pump and haul bypass systems are allowed the Contractor may elect to submit using a pump and haul bypass system for these locations or to use a stationary bypass system.

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8. The Contractor shall have full time (24-hour), onsite qualified pump personnel including supervision for monitoring the entire bypass installation while it is in operation.
9. The entire length of bypass piping shall be walked and inspected hourly to monitor for leaks.
10. High-level alarm notification to cell phones shall not eliminate this requirement.
11. Where bypass pumping systems exceed 1,500 feet in length or cannot be completely observed from the bypass pump location, at least one attendant shall be assigned to the pump operation, and one additional attendant shall be assigned to walk and monitor the pipeline.
12. Prior to installing any plugs, the Contractor and SAWS shall inspect the existing pipe using a pole camera, for imperfections that might cause damage to the plug, cause the plug to not seal or function properly, or compromise the integrity of the pipe when the plug is inflated.
13. If debris is present in the existing line to be plugged, it shall be removed prior to plug installation.
14. The results of this inspection shall directly impact the planned plugging location(s). Contractor shall allow the Engineer an opportunity to confirm that the location of plug(s) is acceptable.
15. The Contractor shall monitor on daily basis the radio transmitter battery and radio signal strengths. If either are found to be below the manufacturer's requirements the radio transmitter shall be immediately replaced.
16. Lines inserted into any manholes or structures shall be constructed with elbows, or be otherwise angled, to direct discharge along the most efficient path for entry into the downstream line without causing unnecessary turbulence of flow.
17. The termination point of the discharge piping shall extend to the crown of the pipe housed within the manhole or structure receiving the bypassed flows.
18. Contractor shall provide continuous supply on-site fuel storage sufficient for 24-hour operation of the bypass pumping installation.
19. Contractor shall protect all components of the bypass operations from vandalism and vehicular damage by making the site secure.
20. Contractor shall minimize sanitary sewer odors by using lids, shroud covers, or any method accepted by the Inspector or Engineer.
21. Contractor shall be solely responsible for any and all damages to private and/or public property caused by, or during, the installation, operation, and/or removal of the bypass pumping system. Contractor shall be fully responsible for all damages and costs related to the installation, operation, and maintenance of Contractor's bypass pumping operations including damages, clean up, fines, penalties, and other related costs.
22. Once all work is completed and the bypass pumping operation is no longer required, the Contractor must disinfect and drain the entire BPP system in accordance with approved submittal. All excavations for bypassing operations shall be backfilled, compacted and pavement restored as directed by the Engineer.

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23. SAWS will not be responsible for additional traffic control measures that might be required by CoSA, Bexar County, TxDOT, or any other public entity having jurisdiction of the project location.
24. Flow Tracking
 - a. Contractor shall continuously track all flows being bypassed. Flow monitoring data shall be provided to SAWS Inspector on a daily basis.
25. Plug Installation
 - a. Safety
 - i. The Contractor shall be solely responsible for the safe and effective use of plugs, including the proper combination of inflatable/mechanical plugs to block the sewer flow at both the upstream and downstream ends of a sewer bypass.
 - ii. Inflatable plugs should be used only after receiving training as recommended by the manufacturer.
 - iii. An inherent danger exists with all inflatable products. If any conditions with this equipment exist that may jeopardize the safety of workers or others, corrective actions should be taken prior to the equipment use.
 - b. Plugs
 - i. Plugs must be selected and installed in accordance with the manufacturers recommendations.
 - ii. Plugs shall be tested prior to use. See Plug testing of this Specification.
 - iii. Plugs must be selected and installed according to the size of the line to be plugged.
 - iv. Spare plugs – Provide spare plugs on-site ready to be installed in the event a plug fails or becomes dislodged.
 - v. Plugs must be removed from the system upon completion of the work. In order to verify that all plugs have been removed from the system, Contractor shall only do so in the presence of the Inspector.
 - vi. Damages – The Contractor will be responsible for damages due to plugs being left in place or dislodged, including but not limited to:
 1. Damages to SAWS infrastructure or private property.
 2. Costs associated with sanitary sewer overflows including: regulatory fines; sewage and debris cleanup; debris disposal at an appropriate landfill; disinfection of all surfaces which have come in contact with the sewage.
 3. All costs associated with locating and retrieving lost or dislodged plugs.
 4. A lost plug shall require Contractor to pay a minimum of a \$25,000 fine for each plug lost. These costs will not be considered for any additional payment.
 5. If the plug is damaged, it shall be immediately removed from the job-site.

865.6 TESTING AND QUALITY CONTROL: Testing and quality control will be required for stationary bypass pumping and pump and haul bypass systems as indicated below. For 8” and 12” sanitary sewer mains which flow level is less than one half of the pipe diameter a 24 hour by pass test will not be required. A one to two hour test will be required at the discretion of the inspector.

1. Contractor shall obtain and keep copies of all required permits on site prior to beginning Testing and throughout performance of the Work.
2. Contractor must prove to the Owner that the equipment, materials and all operational aspects and/or appurtenances related to the BPP are in good condition prior to commencing the bypass pumping operation.
3. Failure to do so will result in the Contractor not being permitted to continue with any construction work requiring bypass pumping operations.
4. Contractor must notify the SAWS’ Inspections Department 48 hours prior to commencing any testing.
5. Any flows surcharging the sanitary sewer system during the test and/or during actual bypass periods will deem the BPP to be unacceptable and must be revised and resubmitted for approval.
6. There will be no separate pay item if this condition occurs during the timeframe in which bypass pumping test and/or operations are underway during the project. **No testing of the bypass pumping operation shall be conducted between Thursday and Sunday, unless approved by SAWS Inspections Management.**
7. If bypass pumping will take place outside normal work hours which are between 8 am to 5 pm Mondays through Fridays (except for SAWS observed holidays), Contractor shall reimburse SAWS for the overtime costs required by his bypass pumping testing outside of SAWS normal work hours.
8. Stationary Bypass Pumping Systems
 - a. Discharge piping, joints and all accessories will be required to be hydrostatic tested.
 - b. SAWS Inspector must be notified 48 hours prior to any test commencing.
 - c. All piping, joints, and accessories shall be able to withstand at least twice the maximum system pressure or a minimum of 50 psi, whichever is greater. For any bypass operations proposed a test run of at least (2) two hours must be satisfactorily performed, prior to commencing any construction work.
 - d. The SAWS Inspector must acknowledge the start of the (2) two hour test.
 - e. Without the Inspectors’ recognition that the (2) two our test has been initiated, the test will be deemed invalid.
 - f. Contractor shall provide both a strobe light type high level alarm, as well as alarm notification to their cell phones, as well as other appointed personnel to be identified by SAWS, and insure adequate alarm notification is attained prior to actual startup of the test period.
 - g. During the testing period, the Contractor shall install a Float Monitoring System in the upstream manhole from the suction location and/or pipe to

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confirm that the bypass pumping flow data shown in their BPP remains applicable.

- h. The float monitoring system shall remain in the manhole and/or pipe for the duration of the bypass operation.
 - i. The data collected during the test and duration of the bypass operation shall be provided to the SAWS Inspector for evaluation and recording on a daily basis and at the Inspector's request.
 - j. It will be required of the Contractor to have personnel remain onsite at the flow monitoring system in order to continuously record (every 30 minutes) the flows during both the test and actual bypass pumping periods.
 - k. Contractor shall submit a copy of Testing Float Monitoring System Data log to SAWS upon successful completion of test within 3 business days to SAWS, failure to do so may result in the test being deemed invalid.
 - l. Data log shall be in column format with each line entry indicating the time, elapsed time of test, level of flow indicated in manholes, total flow being pumped by the BPP system, and any comments pertaining to the test.
 - m. Any failure of equipment, or activities associated with the bypass pumping operations contributing to either a surcharge or SSO, shall be deemed a failed test.
 - n. The test shall then be stopped and any necessary cleanup or reporting efforts performed.
 - o. The BPP will need to be revised, resubmitted and approved prior to the test initiating again. The SAWS inspector will need to be notified 48 hours prior to any and all re-tests of the bypass pumping operations.
 - p. Any effort by SAWS or other third parties to mitigate damages resulting from any surcharging or SSOs shall be the direct and sole responsibility of the Contractor. This includes any related fines, penalties, or damages to public or private property
 - q. Plug Testing
 - i. Plugs shall be tested prior to use. The inflatable plug shall be placed inside of a structurally sound pipe or conduit and inflated to its operating pressure and monitored for 24 hours to observe it holds the required pressure. This testing shall be performed in accordance with the manufacturer's recommendations. Inflating a plug when it is not constrained or overinflating the plug creates a risk of being injured by pieces of the plug exploding if it fails.
9. Pump and Haul Bypass Pumping Systems
- a. Contractor shall perform a full scale demonstration test of his proposed pump and haul bypass system to prove that his system can be successfully used for bypass pumping at the proposed locations.
 - b. Contractor's test shall use all of the equipment and staff that will operate the bypass pumping system during performance of the Work.
 - c. Traffic control systems required during the Work shall be utilized during the test.

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- d. Withdrawals and discharges of flow shall be from or into the manhole locations identified in the Contractor's BPP except for pump and haul system.
- e. This requirement is intended to demonstrate to SAWS that the Contractor's proposed BPP is capable of providing satisfactory bypass pumping prior to Contractor beginning the Work, including the size and number of trucks and cycles times.
- f. Pump and haul system flow shall be disposed of in a TCEQ licensed facility and all manifests shall kept and submitted to SAWS.
- g. Disposal pump and haul flow in a nearby manhole is not acceptable.
- h. NOT ALLOWED OVER THE EARZ

865.7 MEASUREMENT:

- 1. Measurement for the work specified herein will be by lump sum and shall include pumps, pipe, plugs, transmitters and any other items required for successful bypass pumping.

865.8 PAYMENT:

- 1. Payment of the "Lump Sum" bid for Bypass Pumping shall be in accordance with the following:
 - a. Any effort required for multiple set-ups and operations shall be included in the lump sum price.
 - b. When initial set-up and operation of the bypass pumping system begins (including a successful test), 20% of the "Lump Sum" cost will be paid as applicable to the bypass system used; stationary bypass pumping or pump and haul bypass systems.
 - c. 60% of the "Lump Sum" cost will be paid over equal monthly payments (estimated from the BPP or other documentation approved by the Inspector) during the course of the bypass pumping operation as applicable to the bypass system used; stationary bypass pumping or pump and haul bypass systems.
 - d. 20% of the remaining "Lump Sum" cost will be paid upon an acceptable removal and/or disassembly of all components of the BPP, including site cleanup as applicable to the bypass system used; stationary bypass pumping or pump and haul bypass systems.
 - e. For multi-bypass pumping setups, payment will be proportional to the overall amount of the established bid line item.
 - f. Any damages, repairs, etc., to private or public property will not be considered for any additional payment.

-End of Specification-

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ITEM 866

Sanitary Sewer Main Television Inspection

866.1 DESCRIPTION: The Contractor shall furnish all labor, materials, equipment, and incidentals to provide the televising and a NASSCO-(PACP) compliant standard video, recorded in MPEG-4 (MP4) format. In accordance with NASSCO PACP requirements, all inspections shall be conducted by a NASSCO certified CCTV operator and shall include respective certification number on each video and a NASSCO PACP database shall be submitted and uploaded onto SAWS Contract and Project Management System (CPMS) or SAWS most current program management system. All digital video files shall be color, closed-circuit TV in MPEG-4 (MP4) format. The video shall include an inclinometer, visible on the video being viewed, noting the slope of the main being televised. The Contractor shall provide inclination reports detailing the inclinometer data found in the main being televised. The Contractor shall provide all inspection data of mains and manholes written to a single storage device. The video Contractor maybe required to televise both pre and post project.

866.2 REFERENCED STANDARDS: Reference standards cited in the Specification Item No. 866 refer to the current reference standard published at the time of the latest revision date.

1. San Antonio Water System (SAWS):
 - a. Specifications for Water and Sanitary Sewer Construction
 - b. SAWS Materials Specifications
2. COSA – City of San Antonio:
 - a. Utility Excavation Criteria Manual.
 - b. City of San Antonio (COSA) Specifications for Construction
3. Texas Commission of Environmental Quality (TCEQ)
 - a. Chapter 217 Design Criteria for Domestic Wastewater Systems
 - b. Chapter 213 (“Edwards Aquifer Recharge Zone”)
4. National Association of Sewer Service Companies
 - a. Pipe Condition Assessment Using CCTV Performance Specification Guideline

866.3 SUBMITTALS: All submittals shall be in accordance with most recent version of SAWS’s General Conditions requirements. Submit the following prior to performing any work.

1. Certifications: Per General Conditions section 5.12.2 all Contractor submittals for all pipe and other products or materials furnished under this specification shall be marked as reviewed and approved by Contractor for compliance with Contract Documents and the referenced standards
2. Contractor is to coordinate the video procedures with the Inspector prior to commencement of any work, including mobilization and preparation of right-of-way effort.
3. The Contractor is to provide the televising and a NASSCO-(PACP) compliant standard video, recorded in MPEG-4 (MP4) format.
4. All inspections shall be conducted by a NASSCO certified CCTV operator and

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- shall include respective certification number on each video in accordance with NASSCO PACP requirements.
5. Video shall be submitted and uploaded onto SAWS CPMS or SAWS most current program management system. Video must include all the televised segments for the entire project, or for each worksite.
 6. Log of the televised system for review shall be uploaded for review and approval by the Engineer.
 7. Contractor to provide a post construction video upon request.
 8. Contractor is to coordinate the video procedures with the Inspector at completion of project, prior to close out.
 9. The Contractor shall provide a line diagram area sketch and written log for each completed segment of videoed sewer main describing the section being televised, flow and camera direction, position of service connections, description and location of failures, pipe condition, weather conditions, and other significant observations.
 10. Video shall include an inclinometer, visible on the video being viewed, noting the slope of the main being televised.
 11. The Contractor shall provide a graphed report of the inclinometer data gathered for each completed segment of videoed sewer main.

866.4 EXECUTION: Before construction of the sanitary sewer main, the main shall be televised to locate laterals, observe existing conditions and immediately upon cleaning or clearing existing main. After completion of the work specified in the contract documents, and prior to placement of the final course of asphalt or other final surface, the newly constructed or rehabilitated sanitary sewer main shall be televised immediately upon cleaning.

1. Equipment:
 - a. The television unit shall have the capability of displaying in color, on the video, pipe inspection observations such as pipe defects, sags, and points of root intrusion, offset joints, service connection locations, and any other relevant physical attributes.
 - i. Each video shall be permanently labeled with the following:
 - ii. Project name / SAWS Job # / Work Order #;
 - iii. Date of television inspection;
 - iv. Station to station location and size of sanitary sewer;
 - v. Street/easement location;
 - vi. Name of Contractor;
 - vii. Date video submitted;
 - viii. Video number;
 - ix. SAWS Inspector Name.
 - b. The television inspection equipment shall have an accurate footage counter which displays on the monitor the exact distance of the camera from the center of the starting manhole.
 - c. A camera with rotating and panning lens capabilities is required.
 - d. The camera height shall be centered in the conduit being televised.
 - e. The speed of the camera through the conduit shall not exceed 40 feet per

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- minute.
 - f. The produced video shall also have an inclinometer that displays the slope of the sewer main being televised.
 - g. The Contractor shall be required to have all materials, equipment, and labor force necessary to complete all videotaping on the job site prior to isolating the sewer manhole segment and beginning videotaping operations.
2. Televising shall be observed by the Inspector or Engineer and Contractor, as the camera is run through the system.
 3. Any abnormalities such as, but not limited to, misaligned joints, cracked/defected pipe, rolled gaskets, shall be repaired by the Contractor solely at his expense.
 4. Sections requiring repair shall be re-televised from manhole to manhole to verify condition of repair.
 5. If the Contractor provides a video of such poor quality that it cannot be properly evaluated, the Contractor shall re-televising as necessary and provide a video of good quality at no additional cost to SAWS.
 6. If the Contractor cannot provide a video of such good quality that can be reviewed by SAWS, SAWS may elect to televise the line at the Contractor's expense.
 7. Television inspection shall be done one section between two manholes at a time.
 8. Flow in the section being televised shall be bypassed if the line is in service and the flow exceeds 25% of the internal pipe diameter.
 9. When the depth of flow at the upstream manhole of the manhole section being worked is above the maximum allowable for television inspection, the flow can be reduced to allowable levels by performing bypass pumping, as approved by the Inspector.
 10. The Contractor shall not be allowed to float the camera.
 11. There may be occasions during the televised inspection of a manhole section when the camera will be unable to pass an obstruction.
 - a. At that time, and prior to proceeding, the Contractor shall contact the Inspector.
 - b. If the length of sewer main cannot be televised because of obstructions, the Contractor shall clean the system as is necessary.
 - c. If, in the opinion of the Inspector, the obstruction is attributed to a collapsed main or pipe deflection, televising shall be suspended, payment shall be made based on the actual televised length, and the remaining televising of the sewer line shall be continued upon successful correction of the blockage by the Contractor at his expense.
 - d. No additional payment shall be made for additional setups required due to obstructions encountered during televising.
 12. No lateral connections shall be made to the sanitary sewer main at the "12 o'clock" position.
 13. All lateral connections shall clearly indicate which side of the sanitary sewer main it was installed from.
 14. The Contractor is solely responsible for any damage of sewer mains as a direct result of televising operations.
 15. Any repair shall also be the responsibility of the Contractor.
 16. The method(s) used for securing passage of the camera are at the discretion of the Contractor, and as approved by the Inspector.
 17. No sanitary sewer main televising effort shall commence until all pertinent permits

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- or required approvals have been obtained by SAWS.
18. No separate and/or additional payment will be made for any excavation, man entry, or any other method which may be required to retrieve video equipment that may have been hung up, destroyed, and/or lost during the operation.
19. Bypass Pumping:
- a. The Contractor shall perform bypass pumping operations in accordance with Specification Item No. 864, "Large Diameter Bypass Pumping," or Specification Item No. 865 "Small Diameter Bypass Pumping".
 - b. The Contractor shall furnish all labor, supervision, tools, equipment, appliances, and materials to perform all operations in connection with bypass pumping of sewage flow for the purpose of preventing interference with the televising of the sanitary sewer manholes and mainlines as well as providing reliable sewer service to the occupants of the buildings being served.
 - c. The Contractor will be required to provide adequate pumping equipment and force mains in order to maintain reliable sanitary sewer service in all mains involved in the scope of the work.
 - d. Under no circumstances shall the flow be interrupted or stopped, such that damage is done to either private or public property, or sewage flows/overflows into a storm sewer or natural waterway.
 - e. The Contractor shall provide bypass pumping of sewage around each segment(s) of main that is to be televised and shall be responsible for all required bulkheads, pumps, equipment, piping, and other related appurtenances to accomplish the sequence of pumping.
 - f. The Contractor shall be required to have all materials, equipment, and labor necessary to complete the repair or replacement on the jobsite prior to isolating the sewer manhole or line segment and beginning bypass pumping operations.
 - g. The Contractor shall locate bypass pumping suction and discharge lines so as to not cause undue interference with the use of streets, private driveways, and alleys to include the possible temporary trenching of force mains at critical intersections.
 - h. Traffic management shall be done under the approval of respective SAWS, City, County, or State Traffic, Barricade, and Signalization Departments.
 - i. The Contractor shall not initiate any effort to accommodate bypass pumping piping operations until specific written approval is given.
 - j. The Contractor shall coordinate with all property owners to ensure that no damage will be caused to their property during any and all sewer rehabilitation work.
 - k. The Contractor shall complete the televising as quickly as possible and shall satisfactorily meet all requirements prior to discontinuing bypass pumping operations and returning flow to the sewer manhole or main segment.
 - l. The Contractor shall ensure that no damage will be caused to private property as a result of bypass pumping operations. Ingress and egress to adjacent properties shall be maintained at all times.
 - m. Ramps, steel plates, or other methods shall be employed by the Contractor to facilitate traffic over surface piping.

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- n. Pre-televising of sanitary sewer lines will be required prior to rehabilitating lines.

866.5 SETTLEMENT TESTING: Settlement testing shall be performed in accordance with Specification Item No. 849 "Sanitary Sewer Testing."

866.6 PAYMENT: Payment will be made for the work to be done for pre and post television inspection on the basis of the unit bid price per linear foot of pipe diameters 8" through 15", 18" through 24", and 27" larger shall be considered full compensation for all labor, materials, settlement test, equipment, tools, logging, cleaning, by pass pumping and incidentals necessary to complete the work, as illustrated below:

- a. 8" through 15"
- b. 18" through 24"
- c. 27" and larger

1. No additional compensation shall be provided for all needed repairs, re-cleaning, or re-televising effort.
2. There will be no separate pay item for this work for bypass pumping associated with this work.
3. There will be no separate pay item for ramps, steel plates, or other methods be employed by the Contractor to facilitate traffic over surface piping.

-End of Specification-

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ITEM NO. 868

Sanitary Sewer System Cleaning

868.1 DESCRIPTION: This item shall govern cleaning the sanitary sewer system. The Contractor shall furnish all labor, equipment, and materials necessary for cleaning the sanitary sewer system, including the removal of all debris/solids, sand, grease, grit, rock, etc. from the sewer mains, manholes, or structures to facilitate television inspection.

868.2 REFERENCED STANDARDS: Reference standards cited in this Specification Item NO. 868 refer to the current reference standard published at the time of the latest revision date.

1. San Antonio Water System (SAWS):
 - a. Specifications for Water and Sanitary Sewer Construction
 - b. SAWS Materials Specifications
2. COSA – City of San Antonio:
 - a. Utility Excavation Criteria Manual.
 - b. City of San Antonio (COSA) Specifications for Construction
3. Texas Commission of Environmental Quality (TCEQ)
 - a. Chapter 217 Design Criteria for Domestic Wastewater Systems
 - b. Chapter 213 (“Edwards Aquifer Recharge Zone”)
4. National Association of Sewer Service Companies
 - a. Sewer Pipe Cleaning Specification Guideline

868.3 SUBMITTALS: Submit equipment manufacturer’s operational manuals and guidelines to the Inspector for review.

1. Submit a list of lawful disposal sites proposed for dumping debris from cleaning operations.
2. Submit and maintain Liquid Waste Manifests conforming to City of San Antonio requirements.
3. Send the SAWS copies of the completed manifests to the Inspector within 24 hours after disposal of waste materials.

868.4 CONSTRUCTION: The Contractor shall be required to have all materials, equipment, and labor necessary to complete the cleaning of the sanitary sewer system on the jobsite prior to isolating it for the cleaning process.

1. The Contractor shall only use the type of cleaning identified below to perform the necessary removal of all material which will not create hazards to health, property, affect downstream treatment plant processes, or damage to the sanitary sewer system.
2. The sanitary sewer mains, manholes, and structures shall be cleaned using mechanical, hydraulically-propelled, and/or high velocity sewer cleaning equipment.
3. The cleaning process shall remove all debris, grease, sand, silts, solids, rags, rock, etc. from each sewer segment, including the manhole(s) or structures.
4. Selection of cleaning equipment and the method for cleaning shall be based on the condition of the sanitary sewer lines at the time work commences and will be subject to SAWS' pre-approval.

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5. All cleaning equipment and devices shall be operated by experienced personnel. Satisfactory precautions shall be taken to protect the sanitary sewer lines, manholes, or structures from damage that might be inflicted by the improper use of the cleaning process or equipment.
6. Any damages done to a sewer line manhole, or structure by the Contractor shall be repaired by the Contractor at no additional cost and to the satisfaction of SAWS.
7. Cleaning shall also include the manhole or structure wall washing by a high pressure water jet.
8. Hydraulic-propelled devices which require a head of water to operate must utilize a collapsible dam.
9. The dam must be easily collapsible to prevent damage to the sewer line, property, etc.
10. When using hydraulically-propelled devices, precautions shall be taken to insure that the water pressure created does not cause damage or flood public or private property.
11. The Contractor shall not increase the hydraulic gradient of the sanitary sewers beyond the elevation that could cause overflow of sewage into area waterways or laterals.
12. The flow of wastewater present in the sanitary sewer line shall be utilized to provide necessary fluid for hydraulic cleaning devices whenever possible.
13. Cleaning equipment that uses a high velocity water jet for removing all debris shall be capable of producing a minimum volume of 50 gpm, with a pressure of 1,500 psi, for the sanitary sewer main and 3,500 psi for the (manhole) structure at the pump.
14. Any variations to this pumping rate must be pre-approved by the Inspector.
15. To prevent damage to older sewer lines and property, a pressure less than 1,500 psi can be used.
16. A working pressure gauge shall be used on the discharge of all high pressure water pumps.
17. The Contractor shall use, in addition to conventional nozzles, a nozzle which directs the cleaning force to the bottom of the pipe for sewers 18" and larger in diameter. The Contractor shall operate the equipment so that the pressurized nozzle continues to move at all times.
18. The pressurized nozzle shall be turned off or reduced anytime the hose is on hold or delayed in order to prevent damage to the line.
19. Mechanical cleaning, in addition to normal cleaning when required, shall be with approved equipment and accessories driven by power winching devices.
20. The Contractor shall submit the equipment manufacturer's operational manual and guidelines to the Inspector, which shall be followed strictly unless modified by the Inspector.
21. All equipment and devices shall be operated by experienced operators so that they do not damage the pipe in the process of cleaning. Buckets, scrapers, scooters, porcupines, kites, heavy duty brushes, and other debris-removing equipment/accessories shall be used as appropriate and necessary in the field, in conjunction with the approved power machines.
22. The use of cleaning devices such as rods, metal pigs, porcupines, root saws, snakes,

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- scooters, sewer balls, kites, and other approved equipment, in conjunction with hand winching device, and/or gas, electric rod propelled devices, shall be considered normal cleaning equipment.
23. In addition to the requirements specified herein, the Contractor shall maintain a clean work area and surrounding premises within the work limits so as to comply with Federal, State, and local environmental and anti-pollution laws, ordinances, codes, and regulations when cleaning and disposing of waste materials, debris, and rubbish.
 24. The Contractor shall also keep the work and surrounding premises within work limits free of accumulations of dirt, dust, waste materials, debris, and rubbish.
 25. Suitable containers for storage of waste materials, debris, and rubbish shall be provided until time of disposal. It is the sole responsibility of the Contractor to secure a licensed legal dump site for the disposal of this material.
 26. Under no circumstances shall sewage or solids removed from the main or manhole be dumped on the ground, streets, ditches, catch basins, storm drains, or sanitary sewers. Cost for this item shall be included in the price bid for sanitary sewer system cleaning.
 27. The Contractor may be required to demonstrate the performance capabilities of the cleaning equipment proposed for use on the project. If the results obtained by the proposed sanitary sewer system cleaning equipment are not satisfactory to the Inspector, the Contractor shall use different equipment and/or attachments, as required, to meet the requirements of the contract documents. More than one type of equipment/attachments may be required at any given location within the project scope.
 28. When hydraulic or high velocity cleaning equipment is used, a suitable sand trap, weir, dam, or suction shall be constructed in the downstream manhole in such a manner that all the solids and debris are trapped for removal.
 29. Whenever hydraulically-propelled cleaning tools which depend upon water pressure to provide their cleaning force, or any tool which retard the flow of water in the sanitary sewer mains are used, precautions shall be taken to insure that the water pressure created does not cause any damage or flooding to public or private property being served by the manhole section involved.
 30. Any damage of property, as a result of flooding, shall be the sole liability and responsibility of the Contractor.
 31. The flow of wastewater present in the sanitary sewer system shall be utilized to provide necessary fluid for hydraulic cleaning devices whenever possible.
 32. When additional quantities of water from fire hydrants are necessary to avoid delay in normal working procedures, the water shall be conserved and not used unnecessarily.
 33. No fire hydrant shall be obstructed or used when there is a fire in the area.
 34. The Contractor shall be responsible for obtaining the water meter and all related charges for the set-up, including the water usage bills from respective water purveyor agency. All expenses shall be considered incidental to the cleaning of the existing sanitary sewer system.

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868.5 MEASUREMENT AND PAYMENT: The Contractor shall be fully responsible and shall be paid for sewer system cleaning as part of Item No. 866, "Sewer Main Television Inspection" for furnishing all labor, hauling, materials, equipment, tools, debris disposal, inspection, and incidentals necessary to complete the work. No separate pay item will be made for sewer system cleaning.

-End of Specification-

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Item No. 901 Rehabilitation of Sanitary Sewer By Cured-In-Place Pipe (Hot Water)

901.1 DESCRIPTION: This specification includes requirements to rehabilitate existing sanitary sewers by the installation of a resin-impregnated flexible tube, which is formed to the original conduit. The lining is inserted via an existing manhole or other access and, depending on the system selected, is installed using one of the following insertion methods:

1. Water inversion – where the lining is inverted under the pressure of water, and cured by circulating hot water.
2. Winched insertion – where the lining is winched into place and inflated against the sewer wall by either a removable bladder inverted into the lining under the pressure of water or a pre-positioned bladder, which is simply inflated. Curing is accomplished using circulated hot water.

901.2 REFERENCED STANDARDS: Reference standards cited in this Specification Item No.901 refer to the current reference standard published at the time of the latest revision date logged at the end of this Specification Item No. 901 unless a date is specifically cited.

1. San Antonio Water System (SAWS):
 - a. Specifications for Water and Sanitary Sewer Construction (2014)
 - b. SAWS Material Specifications
2. City of San Antonio (COSA) Standard Specifications for Construction
3. Texas Commission of Environmental Quality (TCEQ)
 - a. Chapter 217 Design Criteria for Domestic Wastewater System
 - b. Chapter 213 Edwards Aquifer
4. American Society for Testing and Materials (ASTM) International:
 - a. D543, Standard Practice for Evaluating the Resistance of Plastics to Chemical Reagents
 - b. D638, Standard Test Method for Tensile Properties of Plastics
 - c. D695, Standard Test Method for Compressive Properties of Rigid Plastics
 - d. D790, Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
 - e. F1216, Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of Resin Impregnated Tube
 - f. F1743, Standard Practice for Rehabilitation of Existing Pipelines and Conduits by Pulled-In-Place Installation of Cured-In-Place Thermosetting Resin Pipe
 - g. F2019, Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Glass Reinforced Plastic (GRP) Cured-in-Place Thermosetting Resin Pipe (CIPP)
 - h. F2561, Standard Practice for Rehabilitation of a Sewer Service lateral and Its Connection to the Main Using a One Piece Lateral Cured-in-Place Liner
 - i. D2990, Standard Test Methods for Tensile, Compressive and Flexural Creep and Creep-Rupture of Plastics
 - j. D3567, Standard Practice for Determining Dimensions of Fiberglass (Glass-Fiber Reinforced Thermosetting Resin) Pipe and Fittings

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- k. D3681, Standard Test Method for Chemical Resistance of “Fiberglass” (Glass Reinforced Thermosetting Resin) Pipe in a Deflected Condition
- l. D5813, Standard Specification for Cured-In-Place Thermosetting Resin Sewer Pipe

901.3 SUBMITTALS: The Contractor shall submit to SAWS the following specifications, drawings, test results, and other data showing details of the fabrication and installation of the CIPP liner; these submittals shall be considered incidental to this project, unless a specific bid item for such is included in the project bid proposal:

1. Product specifications and technical data for the resin catalyst system, sealing materials, and liner tube.
2. Manufacturer provided information that describes the CIPP materials, curing speeds, curing installation processes, installation pressures, and temperature limitations.
3. Certified test results of physical properties testing and chemical resistance testing of the proposed resin material.
4. Complete design calculations for the liner thickness per ASTM F1216, for each manhole to manhole segment of main to be rehabilitated. The design calculations shall be signed and sealed by a professional Engineer registered in the State of Texas and certified by the manufacturer as to the compliance of the manufacturer’s material to the values used in the calculations. Review of the calculations by the Owner or its Engineer shall not relieve the Contractor of any contractual obligations.
5. If a field wet-out procedure will be used for liner impregnation, submit a complete description of the proposed wet-out procedure with detailed information on equipment and material storage locations, resin volumes and/or weights, liner length, start times, finish times, resin injection locations, and any other pertinent data documenting the wet-out procedure. Provide plan indicating procedure for reconnection of laterals and pipe end seals.
6. Map that legibly shows proposed liner insertion location(s), construction staging area(s), and bypass pump and piping locations.
7. Traffic control plan (if required) in accordance with City of San Antonio Street Cut Policy or TxDOT (Traffic Coordination).”
8. Bypass pumping plan in accordance with Specification Item No. 865, “Bypass Pumping-Small Diameter Sanitary Sewer” or No. 864, “Bypass Pumping-Large Diameter Sanitary Sewer”.
9. Hydraulic flow capacity calculations with a copy of certification verifying Manning’s roughness “n” value for the proposed liner.
10. Schedule of operations for each project or work order.
11. Liner curing parameter records.
12. Pre and post television inspection videos and logs on DVD in accordance with Specification Item No. 866, “Sewer Main Television Inspection”.
13. Physical samples. Samples removed for testing shall be individually labeled and logged with the following information:
 - a. Owner’s Project number and title.
 - b. Sample number.
 - c. Segment number of line as noted on plans.
 - d. Date and time of sample.
 - e. Name of Contractor.

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- f. Name and location of firm performing testing on sample.
14. Certified test results of structural properties of CIPP samples for each segment installed under this contract.
15. Log of pulling forces measured during insertion.
16. Any other testing results or submittals specified in this document or required by applicable ASTM standards.

901.4 MATERIALS

1. Tube
 - a. The tube shall consist of one or more layers of absorbent needled felt fabric or an equivalent non-woven or woven material, or a combination thereof which meets the requirements of ASTM F1216 or ASTM F1743, Section 5. The tube shall be constructed to withstand installation pressures and curing temperatures, have sufficient strength to bridge missing pipe, and stretch to fit irregular pipe sections.
 - b. The impregnated tube shall have a uniform and homogenous thickness that when compressed at installation pressures will meet or exceed the design thickness.
 - c. The tube shall be sized that when installed will tightly fit the internal circumference and length of the original pipe. Allowance should be made for circumferential stretching during inversion.
 - d. The outside layer of the tube (before wet out) shall be coated with an impermeable, flexible membrane that will contain the resin and facilitate monitoring of resin saturation during the resin impregnation (wet out) procedure.
 - e. The tube shall be homogeneous across the entire wall thickness containing no intermediate or encapsulated elastomeric layers. No material shall be included in the tube that may cause delamination in the cured CIPP. No dry or unsaturated layers shall be evident.
 - f. The wall color of the interior pipe surface of CIPP after installation shall be a light reflective color so that a clear detailed examination with closed circuit television inspection equipment may be made.
 - g. Seams in the tube shall be stronger than the un-seamed felt and meet the requirements of ASTM D5813.
 - h. The outside of the tube shall be marked for distance at regular intervals along its entire length, not to exceed 5 ft. Such markings shall include the manufacturer's name or identifying symbol. The tubes must be manufactured in the USA.
2. Resin
 - a. The resin system shall be a corrosion resistant polyester, vinyl ester, or epoxy and catalyst system.
 - b. When properly cured, the tube composite meets the requirements of ASTM F1216, ASTM F1743 and ASTM F2019, the physical properties herein, and those that are to be utilized in the design of the CIPP for this project.
 - c. The resin shall produce CIPP that will comply with the structural and chemical resistance requirements of this specification.
3. Structural Requirements:

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- a. The CIPP shall be designed as per ASTM F1216, Appendix X1. The CIPP design shall assume no bonding to the original pipe wall.
- b. The Contractor must have performed long-term testing for flexural creep of the CIPP pipe material installed by his Company. Such testing results are to be used to determine the long-term, time dependent flexural modulus to be utilized in the product design. This is a performance test of the materials (Tube and Resin) and general workmanship of the installation and curing. A percentage of the instantaneous flexural modulus value (as measured by ASTM D790 testing) will be used in design calculations for external buckling. The percentage, or the long-term creep retention value utilized, will be verified by this testing. Values in excess of 50% will not be applied unless substantiated by qualified third party test data. The materials utilized for the contracted project shall be of a quality equal to or better than the materials used in the long-term test with respect to the initial flexural modulus used in design.
- c. The layers of the cured CIPP shall be uniformly bonded. It shall not be possible to separate any two layers with a probe or point of a knife blade so that the layers separate cleanly or the probe or knife blade moves freely between the layers. If separation of the layers occurs during testing of field samples, new samples will be cut from the work. Any reoccurrence may cause rejection of the work.
- d. The CIPP shall be classified as conforming to the following structural properties:

| MINIMUM PHYSICAL PROPERTIES | | |
|--|------------------------|------------------------|
| Property | Test Method | Cured Composite |
| Modulus of Elasticity | ASTM D790 (short term) | 250,000 psi |
| Flexural Strength | ASTM D790 | 4,500 psi |
| Compressive Strength | ASTM D695 | 6,500 psi |
| Tensile Strength (for pressure pipe only) | ASTM D638 | 3,500 psi |

- e. The required structural wall thickness shall be based as a minimum on the physical properties listed above, the design equations in ASTM F1216, Appendix X1 (as referenced by ASTM F2019), and the following design parameters:
 - 1) Pipe condition: Fully deteriorated.
 - 2) Minimum design safety factor: 2.0.
 - 3) Percentage ovality of original pipe: 2.0%.
 - 4) Soil density: 120 lbs/ft³.
 - 5) Traffic Loads: HS-20-44 per AASHTO highway loading.
 - 6) Soil Modulus: 500 psi.
 - 7) Groundwater depth shall be ground surface at a minimum or the elevation of the 100 year floodplain water surface, whichever is greater”, in order to account for all reasonable anticipated future loadings;
 - 8) Long Term Flexural Modulus Retention: 50%
 - 9) Soil depth: maximum distance in feet measured between the crown

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- of the pipe and the highest point of soil cover over the length of continuous CIPP section.
- 10) The liner shall be designed for a minimum fifty-year service life under continuous loading conditions.
- f. Contractor shall submit design calculations in accordance with ASTM F1216 that substantiate the CIPP wall thickness for each continuous length of CIPP installed. The required CIPP wall thickness shall be uniform from CIPP start point to CIPP finish point with no deviation in thickness.
4. Acceptable Manufacturer
 - a. Vendors must have approval through SAWS Standards Committee prior to product use and must meet all requirements set forth in this Specification Item No. 901.

901.5 CONSTRUCTION

1. Installer Qualification Requirements
 - a. Installation of the CIPP products shall be performed by a work force that is experienced and certified in installation of the products. The installer shall be certified by the CIPP product manufacturer to have been trained and approved in the installation of their CIPP products and have a minimum of 3 years total experience with the product. The Contractor shall submit such certification of hot water CIPP Installer to Owner. Contractor shall also submit to Owner at least five (5) recent references of the CIPP installer, indicating successful installation of proposed hot water CIPP on projects of similar size and scope. Installer's project manager must have a minimum of 3 years of CIPP installation experience and must be on-site during the installation of the CIPP products
2. Installer Equipment Requirements
 - a. Installer shall only use hot water equipment that has been certified and approved for use by the CIPP product manufacturer.
3. Public Notification
 - a. The Contractor shall maintain service usage throughout the duration of the project. In the event that a service will be out of service, the maximum amount of time of no service shall be 8 hours for any property served by the sewer. A public notification program shall be implemented, and shall as a minimum, require the Contractor to be responsible for contacting each home or business connected to the sanitary sewer informing them of the work to be conducted, when the sewer will be offline, and any alternative method of service that may be provided. The Contractor shall also provide the following:
 - b. Written notice to be delivered to each home or business two business days prior to the beginning of work being conducted on the section, and a local telephone number of the Contractor they can call to discuss the project or any problems which could arise.
 - c. Personal contact with any home or business which cannot be reconnected within the time stated in the written notice.
 - d. Inform SAWS Inspection Department 48 hours prior to starting the work.
4. Protection
 - a. The Contractor shall provide for the general safety of workers, pedestrians and traveling public throughout the project. Existing surface

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- improvements and underground facilities and utilities shall also be protected. Damage caused by the Contractor shall be repaired at his own expense. Protection to be provided shall include but not be limited to:
- b. Provide barricades, warning lights and signs for excavations created by point repairs and/or excavation pits. Conform to requirements of TxDOT, City of San Antonio, Bexar County, or any other governing entity, and of contract documents.
 - c. Protection of Manholes/Structures: Install all pulleys, rollers, bumpers, alignment control devices and other equipment required to protect existing manholes/structures, and to protect the pipe from damage during installation. Lubrication may be used as recommended by the manufacturer. Under no circumstances will the liners be stressed beyond their elastic limit.
 - d. Do not allow sand, debris, or runoff to enter sewer system.
 - e. Verify location of all underground utilities and facilities potentially impacted by rehabilitation or other related project activities and take necessary precautions to provide protection from damage. Damage caused by the Contractor shall be his responsibility and repaired at no additional cost to SAWS.
 - f. Protect the liner and components during all phases of work including, but not limited to hauling, installation, entry into the entry pit, and prevention of scarring or gouging of the liner, pipe or components.
 - g. Contractor will be responsible for monitoring weather prior to planning a CIPP tube insertion to account for a sufficient duration of tube wet out and insertion and curing in order to ensure that wet weather that will prevent access to the project site is accounted for. Contractor's failure to account for oncoming weather will be Contractor's sole responsibility which may extend to removal of damaged or improperly cured CIPP resulting from interrupted CIPP construction process.
 - h. Contractor shall notify owner 72 hours prior to liner wet out process for approval. Weather conditions and on-site conditions need to be considered.
 - i. One (1) hour prior to liner being installed, Contractor must televise host pipe with Inspector present to ensure no pipe condition changes have occurred.
5. Access Pit Location
- a. Location and number of insertion or launching pits will be chosen by the Contractor and approved by SAWS, and will typically be located at or near existing or proposed manholes or junction boxes, Points of Intersection (P.I.) in the line, at logical breaks in the construction phasing, or at locations to comply with access or maintenance requirements. The ends of the insertion excavation pit shall be sloped 2:1 or flatter, or proper shoring devices shall be used. Pits shall be placed and located to minimize the total number of pulls and maximize the length of CIPP, within the constraints of maintaining service and access and other requirements. When excess ground water is encountered, it shall be removed by the Contractor, and will be considered incidental to the project.
6. Sewage Bypass
- a. A detailed bypass plan shall be submitted by contractor and approved

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by Engineer and Owner prior to starting work. The bypass plan shall be developed in accordance with Specification Item No. 864, Bypass Pumping-Small Diameter Sanitary Sewers or No. 864, Bypass Pumping-Large Diameter Sanitary Sewers.

7. Cleaning and Television Inspection
 - a. Before installing the new pipe, the existing sewer shall be cleaned and inspected per Specification Item No. 866, "Sewer Main Television Inspection" and Specification Item No. 868, "Sanitary Sewer System Cleaning". Notify SAWS Inspection Department of any conditions which may prevent proper installation of the liner. All CCTV work will confirm active laterals and location.
8. Point Repairs and Obstruction Removal
 - a. SAWS shall be notified and shall approve any point repair or obstruction removal before it is constructed. Point Repairs and Obstruction Removals shall conform to Specification Item No. 1103, "Point Repairs and Obstruction Removals."
9. Pipe Leakage Control
 - a. Contractor shall stop infiltration or leakage into the existing pipeline to prevent contamination of resin in liner.
10. Operation
 - a. CIPP installation shall be in accordance with ASTM F1216, Section 7, or ASTM F1743, Section 6, and manufacturer's recommendations with the following modifications:
 - b. Resin Impregnation – The quantity of resin used for tube impregnation shall be sufficient to fill the volume of air voids in the tube with additional allowances for polymerization shrinkage and the loss of resin through cracks and irregularities in the original pipe wall. A vacuum impregnation process shall be used. To ensure thorough resin saturation throughout the length of the felt tube, the point of vacuum shall be no further than 25 feet from the point of initial resin introduction.
 - c. After vacuum in the tube is established, a vacuum point shall be no further than 75 feet from the leading edge of the resin. The leading edge of the resin slug shall be as near to perpendicular as possible. A roller system shall be used to uniformly distribute the resin throughout the tube. If the installer uses an alternate method of resin impregnation, the method must produce the same results. Any alternate resin impregnation method must be proven.
 - d. Tube Insertion – The wetout tube shall be positioned in the pipeline using either inversion or a pull-in method. Under the inversion method, care shall be taken during the inversion process so as not to over-stress the tube. If pulled into place, a power winch should be utilized and care should be exercised not to damage the tube as a result of pull-in friction. The tube should be pulled-in or inverted through an existing manhole or approved access point and fully extended to the next designated manhole or termination point. The contractor shall install a gauge to monitor the pulling force of the pulled in tube. A written log shall be kept noting the pulling force and any fluctuations in the pulling force. The force shall not exceed the manufacturer's recommendations. Any occurrences exceeding the manufacturer's recommendations will be cause for rejection of work.

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- e. The manufacturer shall provide the minimum pressure required to hold the tube tight against the existing conduit, and the maximum allowable pressure so the tube is not damaged. These pressure ranges shall be maintained until the inversion has been completed. A temporary water meter shall be installed on the fire hydrant, if used for inversion process.
The cost to coordinate and install the meter for construction purposes shall be at the Contractor’s expense.
 - f. Temperature gauges shall be placed between the impregnated tube and the existing pipe at the invert level of each end to monitor the temperatures during the cure cycle. A written log shall be kept and submitted to the owner. Any invalid temperature readings not recommended from the manufacturer will be cause for rejection.
 - g. The curing shall be accomplished by utilizing hot water under hydrostatic pressure in accordance with the manufacturer’s recommended cure schedule. After the tube is cured, the new pipe shall be cooled to a temperature below 100° F (38° C) before relieving the internal pressure within the section. In addition, care shall be taken during cool down so that a vacuum will not develop that may damage the newly installed pipe.
 - h. The finished pipe shall be continuous over the entire length of an inversion run and be free of dry spots, lifts, and delaminations. If these conditions are present, the contractor shall remove and replace the CIPP in these areas at no cost to SAWS.
 - i. Branch connections or service reconnections shall be reopened without excavation, utilizing a remote controlled cutting device, monitored by a video TV camera. The Contractor shall certify he has a minimum of 2 complete working cutters plus spare key components on the site before each inversion. Unless otherwise directed by the owner or his authorized representative, all laterals will be reinstated. Open cut excavation for service reconnections will only be allowed if it has been approved in writing from a SAWS Inspector. Service reconnections shall be in accordance with Item No. 1109, “Sanitary Sewer Lateral Stub Outs or Reconnections.” Contractor shall provide all coupons removed as part of the reinstatement of service process to confirm that a) the appropriate number of service connections has been made and b) no coupons were left in the pipe to create an obstruction.
11. Clean Up
- a. Upon acceptance of the installation work and testing, the Contractor shall restore the project area affected by the operations to a condition at least equal to that existing prior to the work.

901.6 TESTING

- 1. Chemical Resistance - The CIPP shall meet the chemical resistance requirements of ASTM F1216, Appendix X2 except as modified herein. Table X2.1 of ASTM F1216 shall be modified as follows. It is required that CIPP samples with and without plastic coating meet these chemical testing requirements. Proof of chemical resistance test shall be provided to the Engineer at least 15 days prior to commencement of work.

Chemical Solution

Concentration %

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- | | |
|----------------------------|--------------------------------------|
| Tap water | pH of 5 to 11 |
| Acids | pH not less than 5.0 |
| Gasoline | Total BETX limit of 100 mg/L |
| Oil & Grease | 50 mg/L |
| Total Phosphorous | 40 mg/L |
| Sodium Hydroxide and other | pH not higher than 11.0 Strong bases |
| Ferric Chloride | 3 mg/L |
| Sodium Hypochlorite | 3 mg/L |
2. Hydraulic Capacity - The Contractor shall submit design calculations verifying that the CIPP shall have flow capacity equal to at least 100 percent of the existing pipe. Flow capacity calculation shall be based on Manning's formula using n (Manning's roughness coefficient) of 0.013 for existing sewer. The "n" value for CIPP used shall have been verified by an independent testing laboratory (third party testing) which the Contractor shall provide.
 3. For each CIPP liner section installed, the Contractor shall obtain CIPP samples large enough to provide a minimum of three specimens and a recommended five specimens for flexural testing. CIPP samples shall be prepared and physical properties tested in accordance with ASTM F1216 or ASTM F1743, Section 8, using either method proposed. The properties must meet or exceed the values listed in Section 901.2.3.d. If test results do not meet the properties, Contractor shall remove and replace CIPP at no cost to SAWS.
 4. Visual inspection of the CIPP shall be in accordance with ASTM F1743, Section 8.6 and Specification Item No. 866, "Sewer Main Television Inspection."

901.7 MEASUREMENT

All sewer pipes will be measured from center of manhole to center of manhole or end of main.

901.8 PAYMENT

Payment for items included in this specification shall be in accordance with the pay items listed below. Work included in these items shall include and the price provided by the Contractor will be considered as full compensation for furnishing and placement of all materials, labor, tools, equipment, testing, preparation, repairs, inspection, phasing, protection, work execution and any other work necessary to complete the project. Payment will be made under the following:

1. **INSTALL CIPP SANITARY SEWER PIPE (HOT WATER), ALL DEPTHS (PAY ITEM 901.1):** The inserted pipe will be paid for at the contracted bid price per linear foot of pipe installed using the CIPP method complete in place for the type and size constructed. Said price shall be full compensation for furnishing all materials, all submittals, sealing materials at manholes/structures and annulus (if required), launching pits, receiving pits, post testing, shoring, bedding, backfilling, curing, site restoration, and all necessary, corresponding, and related work to complete the project. Site restoration (including but not limited to replacement of pavement, sidewalks, driveways, curbing, landscaping, sodding, etc.) will not be paid for separately and shall be considered subsidiary to the CIPP rehabilitation bid items.
2. **SERVICE RECONNECTION:** Measurement and payment for Sanitary Sewer Service Connections shall be made in accordance with Specification Item No. 1109, "Sanitary Sewer Lateral Stub Outs or Reconnections."

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3. POINT REPAIRS AND OBSTRUCTION REMOVAL: Measurement and payment for point repairs and obstruction removals shall be in accordance with Specification Item No. 1103, "Point Repairs and Obstruction Removals."
4. EXTRA LENGTH POINT REPAIR, ALL DEPTHS: Measurement and payment for extra length point repairs shall be in accordance with Specification Item No. 1103, "Point Repairs and Obstruction Removals."
5. BYPASS PUMPING: Payment will be made in accordance with SAWS Specifications for Construction Specification Item No. 865 "Bypass Pumping-Small Diameter Sanitary Sewers" or No. 865, "Bypass Pumping-Large Diameter Sanitary Sewers". There will be no additional or separate payment for documentation, required submittals, and associated or related work.
6. TELEVISION INSPECTION: Payment will be made for television inspection of the sewer line prior to pipe rehabilitation in accordance with SAWS Specifications for Construction Specification Item No. 866 "Sewer Main Television Inspection". There will be no additional or separate payment for "post-TV" video inspection, documentation, required submittals, and associated or related work.
7. CLEANING: Payment will be made for cleaning in accordance with SAWS Specifications for Construction Specification Item No. 868 "Sanitary Sewer System Cleaning". There will be no additional or separate payment for documentation, required submittals, and associated or related work.

End of Specification

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ITEM NO. 1103 Point Repairs and Obstruction Removals

1103.1 DESCRIPTION:

1. Repair of sanitary sewer lines by replacing short lengths of failed pipe with new pipe.
2. Repair of service laterals located within the utility easement or street right-of-way, when replacing short lengths of failed pipe with new pipe.
3. Obstruction removal by remote device or excavation.

1103.2 REFERENCED STANDARDS: Reference standards cited in this Specification Item No. 1103 to the current reference standard published at the time of the latest revision date.

1. San Antonio Water System (SAWS):
 - a. Specifications for Water and Sanitary Sewer Construction
 - b. SAWS Materials Specifications
2. City of San Antonio (COSA) Specifications for Construction
3. Texas Commission of Environment Quality (TCEQ)
 - a. Chapter 217 Design Criteria for Domestic Wastewater Systems

1103.3 SUBMITTALS: Contractor shall submit manufacturer's product data, instructions, recommendations, shop drawings, and certifications.

1. Submit proposed methods, equipment, materials and sequence of operations for point repairs and obstruction removals.
2. Plan operations so as to minimize disruption of utilities to occupied facilities or adjacent property.
3. Submit test reports and inspection pre and post construction.
4. Sewer Main Televising
5. Videos become property of SAWS.

1103.4 MATERIALS:

1. Material of sanitary sewer pipe and lateral:
 - a. Materials for sanitary sewer pipe and laterals shall conform to Specification Item No. 848, "Sanitary Sewers" and Specification Item No. 854, "Sanitary Sewer Laterals."
 - b. If point repair is located at a service connection, use a full-bodied fitting for the service connection.
 - c. No field fabrications of fittings are allowed.
2. Jointing Material: Use flexible adapters secured with ½ inch stainless steel bands, as manufactured by Fernco, or approved equal.
3. All flexible adapters shall be concrete encased to prevent movement or breakage of the steel bands.

1103.5 CONSTRUCTION:

1. Point Repair:

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- a. Locate and replace small lengths of one or more pipe sections where isolated line failure has occurred due to settlement, corrosion, crushing, or separation of joints.
 - b. The Inspector may identify potential locations for point repair, but the Contractor is responsible for verifying all point repair locations.
 - c. Determine the location of point repairs by field inspection (if visible from surface) or smoke testing or video inspection of the sewer line between the manhole sections where the failed pipe is located. If the Contractor identifies the need for additional point repairs beyond those identified in the contract documents, they must first obtain authorization from the SAWS Inspector.
 - d. The Engineer will authorize the Contractor to make additional point repairs based on results of smoke testing and video inspection.
 - e. Smoke testing shall not be performed within 24 hours of a rainfall event, or if ponding/ standing water is present on the ground or in the drainage channels in the area planned for smoke testing
 - f. Smoke testing shall be accomplished utilizing two minimum 1,750 CFM blowers designed specifically for smoke testing of sewers.
 - g. Place blower on the upstream and downstream manhole of the line section to be tested.
 - h. Place sandbags in the upstream and downstream manholes to isolate the section being tested and prevent the migration of smoke into sections not being tested.
 - i. Utilize smoke bombs as necessary to ensure a continuous supply of smoke is provided for the entire duration of the test period.
 - j. The Inspector or Engineer will authorize the Contractor to make additional point repairs.
 - k. Do not make point repairs without prior authorization from the Inspector.
 - l. Perform point repairs only on those portions of service lines which are located in an easement or right-of-way; perform no repairs to service lines on private property.
 - m. Replace all identified damaged pipe for point repairs unless otherwise directed by the Inspector.
2. Obstruction Removal: Remove obstructions by one of the following methods:
- a. Obstruction removal by remote device:
 - (1) Protruding taps: Service laterals that protrude more than one inch into the sewer main.
 - (2) Other obstructions: Hanging gaskets, fixed debris, stabilized sand, hardened mineral deposits, roots, rust scale, tuberculation, etc.

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- (3) Payment will not be made for obstruction removal if the existing sewer line, service line, or tap is damaged and point repair is required.
 - b. Obstruction removal by excavation: Obstructions encountered during liner insertion that are removed by digging and exposing the damaged section of main.
3. Sequencing:
 - a. Before rehabilitating a section of sewer main between adjacent manholes, complete point repair and obstruction removal of that section.
 - b. Clean line and perform post-installation video inspection for each point repair on sewer mains not scheduled for rehabilitation.
 - c. Post-installation video inspection of service laterals having point repairs performed are required.
 - d. All approved post installation video shall be performed in conformance to Specification Item No. 866, "Sewer Main Television Inspection."
4. Protection:
 - a. Provide barricades, warning lights and signs for excavations created by point repairs. Comply with Specification Item No. 805; "Temporary Facilities and Controls."
 - b. Do not allow soil, sand, debris or runoff to enter sewer system.
5. Bypass Pumping:

Install and operate bypass pumping equipment as required to maintain sewage flow and to prevent backup or overflow. Comply with Specification Items No. 864, "Large Diameter Bypass Pumping." Or Specification Item No. 865 "Small Diameter Bypass Pumping."
6. Excavation:
 - a. Excavate and backfill trenches in accordance with Specification Item No. 804, "Excavation, Trenching and Backfill."
 - b. Perform work in accordance with OSHA standards. Employ a trench safety system as required in Specification Item No. 550, "Trench Excavation Safety Protection."
 - c. Remove and lawfully dispose of excess excavated material and debris from the work site daily.
7. Typical Sequence of Point Repair:
 - a. Perform pre-installation video inspection, if required, to verify location of sewer main point repair locations.
 - b. Perform service testing between manholes to verify location of service lateral point repair locations.
 - c. After the location of a point repair is determined, excavate the required length for the point repair.

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- d. Prior to replacing a damaged section(s) of pipe, determine condition of the existing line on both sides of the point repair by lamping the main at least 10 feet in each direction.
 - e. Determine whether additional lengths of main (beyond "minimum length" criteria) need replacement.
 - f. Report need for additional replacement to Inspector and obtain authorization before proceeding.
 - g. Remove the damaged section(s) pipe and replace with new pipe, shaping the bottom of the trench and placing the required pipe bedding so that the grade of the replaced pipe matches the grade of the existing main.
 - h. Establish proper grade for the section(s) of pipe being replaced using methods acceptable to the Inspector.
 - i. Connect the new pipe to existing main using flexible adapters.
 - j. If joints cannot be made watertight using flexible adapters, place waterstop gaskets on each joint and encase in a reinforced concrete collar.
 - k. Reconnect affected service connections or stacks using full-bodied fittings.
 - l. No field fabrication of fittings is allowed.
 - m. After completion of point repair, and prior to backfill, perform a smoke test to demonstrate satisfactory integrity of the repair, in the presence of the Inspector.
 - n. Test as specified in Specification Item No. 849, "Sanitary Sewer Pipe Acceptance Testing."
 - o. Repair and retest sections that fail until repaired sections pass the test.
 - p. Encase exposed pipe in cement stabilized sand or flowable fill.
 - q. Backfill the excavation as specified in Specification Item No. 804, "Excavation, Trenching and Backfill."
 - r. Perform a post-installation video inspection as specified in Specification Item No. 866, "Sewer Main Television Inspection."
 - s. Point repairs that show offset joints, non-uniform grade, incorrect alignment, excessive deflection or similar conditions are considered defective work.
 - t. Contractor shall replace pipe and bedding, as required, to correct defective work.
9. Abandonment of Point Repair:
- a. Notify the Inspector if a pipe is exposed by excavation and is found to be in good condition, not requiring a point repair. That point repair shall not be performed.
 - b. Notify the Inspector if the pre-installation video inspection reveals that no point repair is required. The point repair shall not be performed.

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- c. Backfill the excavation, replace pavement or sidewalk, and repair and seed or sod unpaved areas. No separate pay item.
10. **Obstruction Removal:**
- a. Remote Device: Remove obstructions identified on video of a sanitary sewer line segment which could cause a non-uniform liner pipe installation or obstruction of the liner during installation. Obtain authorization from the Inspector for obstruction removal with a remote device before proceeding.
 - b. Use a power-driven cutting device (robotic cutter) to remove protruding taps.
 - c. Cut protruding taps so that protrusions are no greater than $\frac{3}{4}$ inch.
 - d. If a protruding tap cannot be removed by the cutting device, then a point repair may be performed.
 - e. Obtain authorization from the Inspector before proceeding.
 - f. To remove other obstructions, use a remote device.
 - g. Pull or drive the device from manhole to manhole up to a continuous length of 500 feet using a solid steel mandrel, porcupine, root saw, bucket, robotic cutter or similar device to remove the obstruction.
 - h. Select a device that is adequately sized to remove the obstruction.
 - i. Use excavation as the method of obstruction removal when installation of the liner in the sanitary sewer is in progress.
 - j. If during the liner insertion operation, a collapsed sewer, offset joint, or other obstruction is encountered which prevents or blocks the passage or insertion of the liner, notify the Inspector for authorization to excavate.
 - k. Excavate at the point where there is an obstruction.
 - l. Use a trench safety system as specified in Specification Item No. 550, "Trench excavation Safety Protection."
 - m. Break out the existing sanitary sewer pipe (carrier pipe) as directed by the Inspector.
 - n. Remove only that amount of material which is causing the obstruction. Remove the minimum amount of carrier pipe.
 - o. Under such conditions, replacement of the carrier pipe is not required.
 - p. Do not disturb the existing sewer bedding during excavation.
 - q. However, if embedment is disturbed during the obstruction removal procedure, place cement-stabilized sand or crushed stone beneath the liner. No Separate pay item.
 - r. When the liner is completely in place, encase it with crushed stone or cement- stabilized sand.

1103.6 MEASUREMENT

- 1. Measurement for sewer line point repair is on a unit price basis for each repair performed.

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- a. Minimum length of pipe to be replaced for each repair, determined by depth of sewer line measured from natural ground to flow line at point of repair.
 - b. 20 feet minimum length.
 - c. Measurement for sewer line extra length point repair is on a linear foot basis in excess of minimum replacement length specified above.
2. Obstruction Removal:
 - a. Obstruction removal by excavation will be paid per each obstruction removal performed.
 3. Payment for service lateral point repair is on a linear foot basis for all sizes of service laterals and for all depths (same unit price per linear foot, regardless of size and depth).
 4. Minimum length of service lateral point repair is 3 feet.

1103.7 PAYMENT

1. When authorized by the Inspector in locations where excavation by machine is not suitable, no direct payment shall be made for hand excavation.
2. No direct payment shall be made for abandonment of point repair.
3. No direct payment shall be made for abandonment of point repair by video inspection.
4. The cost of the following items of work are included in the unit prices for point repairs, and all associated work:
 - a. Excavation, embedment and backfill;
 - b. Hauling away and lawful disposal of excess excavated materials and debris;
 - c. Pipe, pipe fittings, adapters and concrete collars;
 - d. Smoke testing and any required retesting;
 - e. Restoration of site improvements, including sodding;
 - f. Post-cleaning video inspection;
 - g. All materials, labor, equipment, tools and safety plan for the work.
5. Unit Price - Obstruction Removal:
 - a. Obstruction removal by excavation will be paid per each obstruction removal performed.
 - b. Obstruction removal can be submitted for payment when the obstruction has been cleared from the sewer line to be lined.
 - c. Liner work must proceed at least 6 feet before payment for removal of another obstruction will be considered (i.e., all obstruction within a distance of 6 feet is considered to be part of the same obstruction.)
 - d. Obstruction removal by remote device will be paid on a unit price basis, per manhole section, and shall include all obstruction removals within a manhole section.

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- e. The cost of the following work items are included in the unit prices for obstruction removal by remote device or excavation:
 - (1) Cleaning of sanitary sewers due to broken pipe, roots, dirt, loose deposits, etc.;
 - (2) Post television inspection;
 - (3) Excavation, embedment and backfill or flowable fill;
 - (4) Hauling away and lawful disposal of excess excavated material and debris;
 - (5) Restoration of site improvements, including sodding;
 - (6) All other necessary effort to complete work.
 - f. Payment will not be made for obstruction removal if the existing sewer line, service line or tap is damaged and a point repair is required.
 - g. Payment will not be made for removal of a protruding tap if the service reconnection is performed by excavation.
 - h. Removal of hard deposits, concrete, debris, pipes or any other material in a manhole, or that is accessible from the manhole wall, will be cleared under work items for rehabilitation of sanitary sewer pipes and manholes.
6. Stipulated Price (Lump Sum): If the Contract is a Stipulated Price Contract, payment for work in this Section is included in the total Stipulated Price.
7. Payment for service lateral point repair is on a linear foot basis for all sizes of service laterals and for all depths (same unit price per linear foot, regardless of size and depth).
8. No separate payment will be made for point repair done within the limits of a service lateral reconnection as defined in this Section.

- End of Specification -

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ITEM NO. 1109 Sanitary Sewer Lateral and Reconnections

1109.1 DESCRIPTION: This item shall consist of the installation of sanitary sewer lateral connections in sanitary sewer mains serving areas where service did not previously exist in accordance with these specifications and as directed by the Engineer.

1. This item shall also consist of the reconnection of existing sanitary sewer lateral connections along parallel, replacement, or rehabilitated sanitary sewer mains in accordance with these specifications and as directed by the Engineer.
2. This item shall also consist of installation of sanitary sewer stubs, within the street right-of-way, terminating with a clean-out and a plug at the right-of-way line to allow for future connection of a single service, or a double-wye fitting plugged at both to allow for future connection to two services.
3. The materials for sanitary sewer stubs and reconnections shall conform to specifications contained in Item No. 848, "Sanitary Sewers" and Item No. 854, 'Sanitary Sewer Laterals.'

1109.2 REFERENCED STANDARDS: Reference standards cited in this Specification Item No. 1109 refer to the current reference standard published at the time of the latest revision date.

1. San Antonio Water System (SAWS):
 - a. Specifications for Water and Sanitary Sewer Construction
 - b. SAWS Materials Specifications
2. City Of San Antonio (COSA) Standard Specifications for Construction
3. Texas Commission of Environmental Quality (TCEQ)
 - a. Chapter 217 Design Criteria for Domestic Wastewater Systems
4. American Society for Testing and Materials (ASTM) International:
 - a. ASTM D 1784 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
 - b. ASTM D 3034 - Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
 - c. ASTM D 3212 - Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.
 - d. ASTM F 477 – Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

1109.3 SUBMITTALS: Contractor shall submit manufacturer's product data, instructions, recommendations, shop drawings, and certifications.

1109.4 CONSTRUCTION:

1. Performance Requirements:
 - a. Provide a minimum of 72 hours' notice to customers whose sanitary sewer service will potentially be interrupted.

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- b. Accurately field locate service connections, whether in service or not, along the new, repaired, or rehabilitated sanitary sewer main. For parallel and replacement sewers, service connections may be located as pipe laying progresses from the downstream, to the upstream direction.
 - c. Properly disconnect existing connections from the sewer main and reconnect to the rehabilitated section of main, as described in this section.
 - d. Reconnect service connections, including those that go to unoccupied or abandoned buildings or to vacant lots, unless directed otherwise by the Inspector.
 - e. Complete reconnection of service lines within 24 hours after disconnection due to slip-lining, parallel, or replacement of sanitary sewer mains.
 - f. Reconnect services on cured-in-place-pipe (CIPP) without excavation, utilizing remote controlled cutting device, monitored by a video TV camera. CIPP will be completed per Item 901, "Rehabilitation of Sanitary Sewer By Cured-In-Place Pipe (Hot Water)". The SAWS Construction Inspector reserves the right to require service connections by excavation when a remote cut service connect damages the sewer mains or lateral lines. Open cut excavation for service reconnections on CIPP will only be allowed if it has been approved in writing from a SAWS Inspector.
 - g. The Inspector reserves the right to require service connections by excavation when a remote cut service connection damages the main or laterals.
 - h. Reconnection by the excavation method shall include the stack and fittings and required pipe length (up to 10 linear feet) to reconnect service line.
2. Preparation:
- a. Determine the existing sewer lateral locations and number of existing service connections from closed-circuit television (CCTV) inspection video or from a field survey.
 - b. Accurately field locate existing lateral connections, whether in service or not.
 - c. Use existing lateral locations to connect or reconnect service lines to the main.
 - d. For pipe-bursting sanitary sewer mains, allow liner to normalize to ambient temperature and recover from imposed stretch. For cured-in-place liners, verify that liner is completely cured.
 - e. For new parallel and replacement sanitary sewer mains, complete testing and acceptance of downstream sewers as applicable.
3. Reconnection by Excavation Method:
- a. Remove a portion of existing sanitary sewer main or carrier pipe to expose the liner pipe.
 - b. Provide sufficient working space for installing a prefabricated pipe saddle.
 - c. Carefully cut the liner pipe, making a hole to accept the stub out protruding from the underside of the saddle.

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- d. Strap on the saddle using a stainless steel band on each side of the saddle. Tighten the bands to produce a watertight seal of the saddle gasket to the liner pipe.
 - e. Remove and replace cracked, offset, or leaking service line for up to 10 feet, measured horizontally, from the center of the new main or liner.
 - f. Make up the connection between new main or liner and lateral using PVC sewer pipe, with approved fittings and couplings.
 - g. Encase the entire lateral connection in cement stabilized sand as shown in the contract documents.
 - h. Test each lateral connection before backfilling.
4. **Reconnection by Remote Method:**
- a. Make service reconnections using remote-operated cutting tools on cured-in-place liners. If a service connection is dislodged, protruding, misaligned or missing, an open cut excavation can be made only after it has been approved in writing from the SAWS Inspector. If open cut is allowed, a new lateral service piping (including up to 10 linear feet of piping) shall be installed with all approved pipe and connections conforming to Item No. 854, "Sanitary Sewer Laterals
 - b. Employ method and equipment that restore the service connection capacity to not less than 90 percent of original capacity.
 - c. Immediately open any missed lateral connections and repair any holes drilled in error using a method approved by the Inspector.
5. **Reconnection on Parallel or Replacement Segments:**
- a. Install lateral connections on the sewer main.
 - b. Remove and replace cracked, offset or leaking lateral for up to 10 feet, measured horizontally, from the centerline of the sanitary sewer main.
 - c. Make up the connection between the main and the existing lateral using PVC sewer pipe, with approved couplings, as shown in the contract documents.
 - d. Test each lateral connection before backfilling.
 - e. Embed the lateral pipe and point of connection, as specified for the sanitary sewer main, as shown in the contract documents.
 - f. Place and compact trench zone backfill in compliance with Specification Item No. 804, Excavation, Trenching and Backfill.
6. **Installation of New Service Laterals:**
- a. Install laterals on sanitary sewer main for each service connection.
 - b. Provide the length of stub indicated in the contract documents.
 - c. Install plug or cap on the upstream end of the service stub, as needed.
 - d. Test each lateral connection before backfilling.
 - e. Embed the lateral pipe and point of connection, as specified for sanitary sewer main, and as shown in the contract documents.
 - f. Place and compact trench zone backfill in compliance with Specification Item No. 804, Excavation, Trenching and Backfill.

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- g. Install a minimum 2 foot length of magnetic locating tape along the axis of the service stub out and 9 to 12 inches above the crown of the pipe, at the end of the stub out.

1109.5 MEASUREMENT AND PAYMENT:

- 1. Unit Prices:
 - a. Measurement and payment for sanitary sewer service reconnections will be made per each connection. Payment will be made for each connection made by remote control cutting device, open cut excavation, or person entry.
 - b. Payment for lateral stub outs or service reconnections shall be considered full compensation for furnishing of all materials, labor, tools, equipment, testing, cleaning, preparation, repairs, inspection, work execution and any other work necessary to complete the service reconnection.
 - c. Payment for sanitary sewer lateral stub outs or service reconnections without stacks located within 10 feet of the sanitary sewer main, is on a unit price basis for each stub or reconnection.
 - d. Payment will be made for each lateral stub out or reconnection installed complete in place, including service connections, couplings, adapters, disconnecting existing services, reconnecting new service, fittings, excavation, backfill, and testing as required by Specification Item No. 804, Excavation, Trenching and Backfill.
 - e. Payment for sanitary sewer laterals more than 10 feet laterally from the sewer main shall be governed by Specification Item No. 854, "Sanitary Sewer Laterals."
 - f. One or more lateral connections discharging into a common point are considered one service connection.
 - g. The Contractor shall not add lateral reconnections without approval of the Inspector.
 - h. The Inspector may require laterals to be relocated to avoid having more than two lateral connections per reconnection.
 - i. Protruding lateral connections, which must be removed to allow liner insertion, are paid as a lateral reconnection (when connected).
 - j. No direct payment will be made for plugged abandonment of lateral connections.
 - k. No separate payment will be made for abandonment of a lateral connection, unless excavation is required.
 - l. No separate payment will be made for excavation of sanitary sewer laterals within the new or replacement sewer trench.
 - m. No separate payment will be made for removal of existing sanitary lateral service stub outs.
 - n. No separate payment will be made for a plugged and abandoned lateral connection, if the service to be abandoned is within 4 feet of an active connection.
 - o. Payment for abandoned service connection will not be allowed.

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- p. If a faulty remote cut is later corrected using the procedures specified for reconnection by excavation, only one reconnection will be allowed for payment.
- q. No direct payment will be made for hand excavation and backfill when authorized by Inspector in locations where excavation by machine is not suitable.
- r. Payment for service reconnections by open cut shall be considered full compensation for furnishing all materials, labor, tools, fittings, couplings, adapters, stack, disconnecting existing service, up to ten (10) linear feet of lateral pipe, excavation, trenching, shoring, backfilling, concrete encasement, collars, and all necessities and related work specified herein to complete the task. Site restoration (including but limited to replacement of pavement, sidewalks, driveways, curbing, landscaping, sodding, etc.) will not be paid for separately and shall be considered subsidiary to the Service Reconnection by Open Cut bid items. There will be no payment for abandoning service connections.
- s. No payment shall be made for removal of a lodged remote cutting device.

-End of Specification-