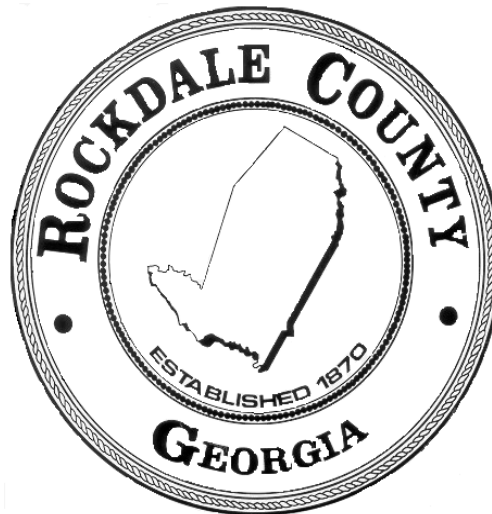


# **ROCKDALE COUNTY, GEORGIA**

**July 20, 2015**

## **ANNUAL SANITARY SEWER REHABILITATION SERVICES**

**INVITATION TO BID  
No. 15-30**



**ROCKDALE COUNTY FINANCE DEPARTMENT  
PROCUREMENT OFFICE  
958 MILSTEAD AVENUE  
CONYERS, GA 30012  
770-278-7553**

**INTRODUCTION:**

This is an Invitation to Bid for an annual contract to provide Sanitary Sewer Rehabilitation Installation and Materials. The awarded contractor will price projects on an as needed basis according to the specifications that are in this ITB. A Payment and Performance Bond may be required per project depending on the cost.

Instructions for preparation and submission of a bid are contained in this packet. Bids must be typed or printed in ink.

Rockdale County provides equal opportunity for all businesses and does not discriminate against any person or business because of race, color, religion, sex, national origin, and handicap or veterans status. This policy ensures all segments of the business community have access to supplying the goods and services needed by Rockdale County.

**PURCHASING CONTACT FOR THIS REQUEST:**

All questions concerning this invitation and all questions arising subsequent to award are to be addressed to the Procurement Officer at the following address:

Rockdale County Finance Department  
Attn: Tina Malone, CPPB CPPO  
958 Milstead Avenue  
Conyers, GA 30012  
Phone: (770) 278-7552, Fax (770) 278-8910  
E-mail: [tina.malone@rockdalecounty.org](mailto:tina.malone@rockdalecounty.org)

To maintain a “level playing field”, and to assure that all bidders receive the same information, bidders are requested **NOT** to contact anyone other than the contact above until after the award of the contract. Doing so could result in disqualification of the bidder.

**BID COPIES FOR EVALUATION:**

Two (2) hard copies and one (1) original hard copy and one (1) CD’s in Adobe PDF format will be required for review purposes. *(With the original clearly marked “Original” and the Copies clearly marked “Copies.”)*. CD’s that are blank or have incorrect information on them will not be acceptable and may be justification for disqualification. Check your disk(s) to ensure that they have the appropriate material on it before submitting.

**CONTRACT TERM:**

The contract term will be one year with the option to renew three (3) additional one (1) year terms, renewable each year.

**DUE DATE:**

Sealed bids will be received at the Rockdale County Finance Department, Procurement Division, 958 Milstead Avenue, Conyers, GA 30012 no later than **2:00 P.M., local time, Thursday, August 27, 2015**. Bids received after this time will not be accepted.

**PRE-BID CONFERENCE:**

There will be no pre-bid conference for this ITB.

**QUESTIONS AND CLARIFICATIONS:**

Any questions and/or misunderstandings that may arise from this ITB must be submitted in writing and forwarded to the Purchasing Department at the above address or by email. It shall be the Bidders responsibility to seek clarification as early as possible prior to the due date and time. You should submit your questions and/or requests for clarifications about this ITB no later than **2:00 p.m., local time, on Friday, August 14, 2015**. Written responses from the County to the questions it receives will be in an addendum and posted to the County's website at [www.rockdalecounty.org](http://www.rockdalecounty.org), Bids, RFPs and Announcements/Current Bids.

**ADDENDA:**

Answers to questions submitted that materially change the conditions and specifications of this ITB will be issued in an addendum and posted to the County's website at [www.rockdalecounty.org](http://www.rockdalecounty.org), Bids, RFPs and Announcements/Current Bids. Any discussions or documents will be considered non-binding unless incorporated and issued in an addendum.

Bidders should check the website at [www.rockdalecounty.org](http://www.rockdalecounty.org), Bids, RFPs and Announcements/Current Bids frequently during the process to verify that they have received all issued addenda. Bidders have the responsibility of making sure that they have received all issued addenda.

**SILIENCE OF SPECIFICATIONS**

The apparent silence of these specifications and any supplemental specifications as to any details, or the omission from it of a detailed description concerning any point, shall be regarded as meaning that only the best commercial practices are to prevail and that only materials of first quality and correct type, size and design are to be used. All workmanship is to be first quality. All interpretations of this specification shall be made upon the basis of this statement, with County interpretation to prevail.

**OPTION TO AUDIT**

Successful bidder will be required to maintain complete records during the life of the contract and for a period of one year after completion of the contract. Such records are to be made available to the County if officially requested, to be audited by a designated County auditing staff. In such audits reveal overcharges and/or undercharges, such will be adjusted and compensation made by either party to correct charges.

**TORT IMMUNITY:**

No officer, employee, or agent of the County acting within the scope of his/her employment or function shall be held personally liable in tort or named as a defendant in any action for injury or damage suffered because of any act, event, or failure to act.

**PROPRIETARY INFORMATION:**

Careful consideration should be given before submitting confidential information to Rockdale County. The Georgia Open Records Act permits public scrutiny of most materials collected as part of this process. Please clearly mark any information that is considered a trade secret, as defined by the Georgia Trade Secrets Act of 1990, O.C.G.A. §10-1-760 et seq., as trade secrets are exempt from disclosure under the Open Records Act. Rockdale County does not guarantee the confidentiality of any information not clearly marked as a trade secret.

**AWARD OF CONTRACT:**

The Rockdale County Procurement Office and/or Evaluation Committee make a recommendation for award. The Board of Commissioners will make the actual award of the contract and has the authority to award the contract to a company different than the company recommended by the Procurement Office and/or Evaluation Committee. Rockdale County reserves the right to make no awards, multiple awards, one award for all items; or whatever the County deems to be in its best interest.

**QUANTITIES:**

The quantities listed in the Bidders Response Schedule are provided as an estimate for bid purposes. The County will not be obligated to quantities beyond actual needs.

**SELECTION PROCESS:**

The Rockdale County Procurement Office and/or Evaluation Committee makes a recommendation for award. The Board of Commissioners will make the actual award of the contract and has the authority to award the contract to a company different than the company recommended by the Purchasing Department and/or Evaluation Committee.

This is a past performance/quality/price trade-off source selection in which competing offeror's past and present performance history and product quality will be evaluated on a basis approximately equal to price. Award will be made to the responsible offeror whose bid represents the best value after evaluation in accordance with the factors listed below. Rockdale County Board of Commissioners may reject any or all bids if such action is in the county's interest.

Rockdale County may evaluate bids and award a contract without discussions with offerors. Therefore, the offeror's initial bid should contain the offeror's best terms from a price and technical standpoint. The County reserves the right to conduct discussions if the County later determines them to be necessary.

**INSURANCE:**

The Company shall maintain in full force and effect the following insurance during the term of the Agreement.

Coverage	Limits of Liability
Workers' Compensation	Statutory
Employers' Liability	\$1,000,000.00
Bodily Injury Liability	\$1,000,000.00 each occurrence
except Automobile	\$1,000,000.00 aggregate
Property Damage Liability	\$1,000,000.00 each occurrence
except Automobile	\$1,000,000.00 aggregate
Personal & Advertising Injury Limit	\$1,000,000.00
Products / Completed Ops.	\$2,000,000.00 aggregate
Automobile Bodily Injury	\$1,000,000.00 each person
Liability	\$1,000,000.00 each occurrence
Automobile Property Damage	\$1,000,000.00 each occurrence
Liability	
 General Liability	 \$1,000,000.00

All insurance shall be provided by an insurer(s) acceptable to the County, and shall provide for thirty (30) days prior notice of cancellation to the County. Upon contract award, Contractor shall deliver to the County a certificate or policy of insurance evidencing Contractor's compliance with this paragraph. Contractor shall abide by all terms and conditions of the insurance and shall do nothing to impair or invalidate the coverage.

Rockdale, GA shall be named as Additional Insured under any General Liability, Business Auto and Umbrella Policies using ISO Additional Insured Endorsement forms CG 2010 or its equivalent. Coverage shall apply as Primary and non-contributory with Waiver of Subrogation in favor of Rockdale County, Georgia.

The insurance carrier must have a minimum rating of A or higher as determined by the rating firm A.M. Best.

Certificates to contain policy number, policy limits and policy expiration date of all policies issued in accordance with this contract.

**BONDS:**

All sureties of bonds for Rockdale County must be licensed to do business in the State of Georgia and must be listed on the Department of Treasury Federal Register.

If project price is \$100,000 or greater, a 5% bid bond and a 100% Payment and Performance Bond will be required.

**PERMITS:**

The awarded contractor will be responsible for acquiring any permits that are required for this project/purchase. Rockdale County will waive fees on all permits issued by Rockdale County.

## **ILLEGAL IMMIGRATION REFORM AND ENFORCEMENT ACT OF 2011**

Vendors submitting a Qualification package in response to this RFP must complete the Contractor Affidavit under O.C.G.A. §13-10-91(b)(1) which is provided with the RFP package to verify compliance with the Illegal Immigration Reform and Enforcement Act of 2011.

- A. The form must be signed by an authorized officer of the contractor or their authorized agent.
  
- B. The form must be notarized.
  
- C. The contractor will be required to have all subcontractors and sub-subcontractors who are engaged to complete physical performance of services under the final contract executed between the County and the contractor complete the appropriate subcontractor and sub-subcontractor affidavits and return them to the County a minimum of five (5) days prior to any work being accomplished by said subcontractor or sub-subcontractor. Format for this affidavit can be provided to the contractor if necessary.

## **LOCAL VENDOR PREFERENCE POLICY**

The Rockdale County Board of Commissioners adopted a Local Vendor Preference Policy on March 26, 2013. The policy will apply to all qualified Invitations to Bids and Request for Proposals after May 1, 2013. The Local Vendor Preference Policy allows Rockdale County vendors to get an extra 5 points on the evaluation criteria scoring for Request for Proposal. The Policy will give the local bidder the opportunity to match the price of a non-local vendor's bid price if they are low and within 5% of the low bidder's price on Invitation to Bids. A copy of the Policy may be downloaded from the County website at [www.rockdalecounty.org](http://www.rockdalecounty.org), Under Finance/Purchasing.

The Local Vendor Preference Policy: will \_\_\_\_\_/will not  - apply to this ITB or RFP.

**GENERAL INFORMATION:**

**RECEIPT OF BID:**

No bids received after said time or at any place other than the time and place as stated in the notice shall be considered. No responsibility shall attach to Rockdale County for the premature opening of a bid not properly addressed and identified.

**WITHDRAWAL OF BID:**

A bidder may withdraw his bid before the bid due date, without prejudice to the bidder, by submitting a written request of withdrawal to the Rockdale County Procurement Office.

**REJECTION OF BID:**

Rockdale County may reject any and all bids and must reject a bid of any party who has been delinquent or unfaithful in any formal contract with Rockdale County. Also, the right is reserved to waive any irregularities or informalities in any bid in the proposing procedure. Rockdale County shall be the sole judge as to which bid is best, and in ascertaining this, will take into consideration the business integrity, financial resources, facilities for performing the work, and experience in similar operations of the various bidders.

**STATEMENT OF EXPERIENCE AND QUALIFICATIONS:**

The bidder may be required, upon request, to prove to the satisfaction of Rockdale County that he/she has the skill, experience, necessary facilities and ample financial resources to perform the contract(s) in a satisfactory manner and within the required time. If the available evidence of competency of any bidder is not satisfactory, the bid of such bidder may be rejected. The successful bidder is required to comply with and abide by all applicable federal and state laws in effect at the time the contract is awarded.

**NON-COLLUSION AFFIDAVIT:**

By submitting a bid, the bidder represents and warrants that such bid is genuine and not sham or collusive or made in the interest or in behalf of any person not therein named, that the bidder has not directly or indirectly induced or solicited any other bidder to put in a sham bid, or any other person, firm or corporation to refrain from proposing and that the bidder has not in any manner sought by collusion to secure to that bidder any advantage over any other bidder.

**INTEREST OF:**

By submitting a bid, the bidder represents and warrants that a Commissioner, Administrator, employee, nor any other person employed by Rockdale County has, in any manner, an interest, directly or indirectly, in the bid or in the contract which may be made under it, or in any expected profits to arise therefrom.

**DOCUMENTS DEEMED PART OF THE CONTRACT:**

The notice, invitation to bidders, general conditions, and instructions for bidders, special conditions, specifications, bid, and addenda, if any, will be deemed part of the contract.

**GOVERNING LAWS:**

This contract is made under and shall be governed and construed in accordance with the laws of the State of Georgia.

**ERRORS AND OMISSIONS:**

The vendor shall not take advantage of any errors or omissions in this Bid Request, and shall promptly notify Rockdale County of any omissions or errors found in this document.

## STANDARD INSTRUCTIONS:

1. The instructions contained herein shall be construed as a part of any bid invitation and/or specifications issued by Rockdale County and must be followed by each bidder.
2. The written specifications contained in this bid shall not be changed or superseded except by written addendum from Rockdale County. Failure to comply with the written specifications for this bid may result in disqualification by Rockdale County.
3. All goods and materials shall be F.O.B. Destination Conyers, Georgia and no freight or postage charges will be paid by Rockdale County unless such charges are included in the bid price.
4. The following **ITB# 15-30** must be written clearly on the outside of each bid envelope in order to avoid prior opening in error.
5. All bids must be received and in-hand at bid due date and time. Each bidder assumes the responsibility for having his/her bid received at the designated time and place of bid due date. Bids received after the stated time and date may be subject to rejection without consideration, regardless of postmark. Rockdale County accepts no responsibility for mail delivery.
6. Unless otherwise stated, all bids submitted shall be valid and may not be withdrawn for a period of 120 days from the due date.
7. Each bid form submitted must include the name of the business, mailing address, the name, title and signature of the person submitting the bid. When submitting a bid to Rockdale County the first page of your bid package should be the bid form listing the price, delivery date, etc., unless the bid form is requested to be in a separate envelope.
8. Rockdale County reserves the right to accept a bid that is not the lowest price if, in the County's judgment, such bid is in the best interest of the County and the public. The County reserves the right to reject any and all bids.
9. Telephone, Telegraphic or Facsimile bids will not be accepted.
10. No sales tax will be charged on any orders except for contracts that include construction materials being purchased through a third party.  
Federal I.D. #58-6000882  
Sales Tax Exempt #58-800068K
11. If applicable, completed questionnaires must be signed manually. Rockdale County reserves the right to accept or reject any bid on the basis of incomplete or inaccurate answers to the questionnaire.
12. If applicable, warranty information shall be provided.
13. Bidders shall state delivery time after receiving order.
14. Bidders shall identify any subcontractors, and include an explanation of the service or product that they may provide.



**ROCKDALE COUNTY BOARD OF COMMISSIONERS**  
**NON-COLLUSION AFFIDAVIT OF VENDOR**

State of \_\_\_\_\_)

County of \_\_\_\_\_)

\_\_\_\_\_, being first duly sworn,  
deposes and says that:

(1) He is \_\_\_\_\_ (owner, partner officer,  
representative, or

agent) of \_\_\_\_\_, the Vendor that has submitted the  
attached bid;

(2) He is fully informed respecting the preparation and contents of the attached bid  
and of all pertinent circumstances respecting such bid;

(3) Such bid is genuine and is not a collusive or sham bid;

(4) Neither the said Vendor nor any of its officers, partners, owners, agents,  
representatives, employees or parties in interest, including this affidavit, has in any  
way colluded, conspired, connived or agreed, directly or indirectly with any other  
Vendor, firm or person to submit a collusive or sham bid in connection with the  
Contract for which the attached bid has been submitted or refrain from proposing in  
connection with such Contract, or has in any manner, directly or indirectly, sought by  
agreement or collusion or communication or conference with any other Vendor, firm  
or person to fix the price or prices in the attached bid or of any other Vendor, or to  
fix any overhead, profit or cost element of the proposing price or the proposing price  
of any other Vendor, or to secure through any collusion, conspiracy, connivance or  
unlawful agreement any advantage against Rockdale County or any person  
interested in the proposed Contract; and

(5) The price or prices quoted in the attached bid are fair and proper and are not  
tainted by any collusion, conspiracy, connivance or unlawful agreement on the part  
of the Vendor or any of its agents, representatives, owners, employees, or parties in  
interest, including this affidavit.

\_\_\_\_\_  
(Signed)

\_\_\_\_\_  
(Title)

Subscribed and Sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_, 20

Name \_\_\_\_\_

Title \_\_\_\_\_

My commission expires (Date)

# TABLE OF CONTENTS

## SPECIFICATIONS

### Division 0 - Bidding and Contract Requirements

<u>Section</u>	<u>Title</u>
00100	Instructions to Bidders
00300	Bid
00410	Bid Bond
00422	Corporate Certificate
00425	Contractor's License Certification
00480	Noncollusion Affidavit of Prime Bidder
00500	Contract Agreement
00610	Performance Bond
00620	Payment Bond
00700	General Conditions
00800	Supplementary Conditions

### Division 1 - General Requirements

01010	Summary of Work
01012	Contractor's Use of Premises
01025	Measurement and Payment
01060	Regulatory Requirements
01091	Codes and Standards
01200	Project Meetings
01310	Construction Schedules
01320	Construction Photographs
01340	Shop Drawings, Product Data and Samples
01510	Temporary Facilities
01540	Job Site Security
01610	Transportation and Handling
01611	Storage and Protection
01630	Substitutions and Product Options
01710	Cleaning
01720	Record Documents
01740	Warranties and Bonds

### Division 2 - Sitework

02110	Easement Clearing
02125	Erosion and Sedimentation Control
02225	Trench Excavation and Backfill
02575	Removing and Replacing Pavement

02720	Manhole Frame Sealing
02728	Sanitary Sewer Manhole Rehabilitation
02726	Sanitary Sewer Service Lateral Reconnections and Replacements
02730	Sewer Lines and Accessories
02734	Pipe Bursting Sanitary Sewer Replacement
02740	Bypass Pumping / Wastewater Flow Control
02741	Sewer Line Cleaning
02742	Sanitary Sewer Television-Sonar Inspection
02746	Cured-in-Place Pipe Lining
02748	Cured-in-Place Pipe for Lateral Connections
02750	Internal Mechanical Point Repairs
02763	Point Repairs to Sanitary Sewer and Service Laterals

**Division 3 – Concrete**

03000	Reinforced Concrete
03200	Concrete Reinforcement

**Division 15 – Mechanical**

15066	High Density Polyethylene (HDPE) Pipe & Fittings
15062	Ductile Iron Pipe & Fittings

**SECTION 00100**  
**Instructions to Bidders**

**1.01 CONTRACT DOCUMENTS**

- A. The Contract Documents include the Contract Agreement, Invitation to Bid, Instructions to Bidders, Contractor's Bid (including all documentation accompanying the Bid and any post-Bid documentation required by the Owner prior to the Notice of Award), Bonds, all Special Conditions, General Conditions, Supplementary Conditions, Specifications, Drawings, and addenda, together with written amendments, change orders, field orders and the PM/CM's written interpretations and clarifications issued in accordance with the General Conditions on or after the date of the Contract Agreement.
- B. Shop drawing submittals reviewed in accordance with the General Conditions, geotechnical investigations and soils reports, and drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site, are not Contract Documents.
- C. The Contract Documents shall define and describe the complete work to which they relate.

**1.02 DEFINITIONS**

- A. Where the following words or the pronouns used in their stead occur herein, they shall have the following meaning:
  - 1. "Owner" shall mean Rockdale County, Georgia, party of the first part to the Contract Agreement, or its authorized and legal representatives.
  - 2. "Program Manager/Construction Manager" shall mean Rockdale Water Resources-Engineering Dept., hereinafter also designated as "PM/CM".
  - 3. "Designer" shall mean Rockdale Water Resources-Engineering Dept.
  - 4. "Contractor" shall mean the party of the second part to the Contract Agreement or the authorized and legal representative of such party.
  - 5. "Work" and "Project" shall mean the entire completed construction required to be furnished under the Contract Documents.
  - 6. "Contract Time" shall mean consecutive calendar days as provided in the Work Order for completion of the Project, to be computed from the date of the Notice to Proceed.

7. "Liquidated Damages" shall mean the sum of \$500.00 which the Bidder agrees to pay for each consecutive calendar day beyond the Contract Time required to complete the Project. Liquidated Damages will end upon written notification from the Owner of final acceptance of the Project.
8. "Products" shall mean materials or equipment permanently incorporated into the Project.
9. "Provide" shall mean to furnish and install.
10. "Balanced Bid" shall mean a Bid in which each of the unit prices and total amount bid for each of the listed items reasonably reflects the value of that item with regard to the entire job considering the prevailing cost of labor, material and equipment in the relevant market. A Bid is unbalanced when, in the opinion of the Owner, any unit prices or total amounts bid on any of the listed items do not reasonably reflect such values.
11. "Substantial completion of the work", solely for the purposes of Official Code of Georgia Annotated (O.C.G.A.) §13-10-20(c), shall be defined as occurring on the date of the written notification from the PM/CM that the Project is ready for final inspection, as specified in Section 00800, Article 30, paragraph (g).
12. "Satisfactorily completed", solely for the purposes of O.C.G.A. §13-10-20(b), shall mean the completion of all work, certifications and affidavits as specified in Section 00800, Article 30, paragraph (g).

**1.03 PREPARATION AND EXECUTION OF BID**

- A. Each Bid must be prepared to represent that it is based solely upon the materials and equipment specified in the Contract Documents.
- B. Each Bid must be submitted on the Bid forms which are attached to the Contract Documents. All blank spaces for Bid prices, both words and figures, must be filled in, in ink. In case of discrepancy, the amount shown in words will govern. All required enclosed certifications must be fully completed and executed when submitted.
- C. Each Bid must be submitted in a sealed envelope, addressed to the Owner. Each sealed envelope containing a Bid must be plainly marked on the outside as, "Bid for Rockdale County, Georgia Sanitary Sewer Rehabilitation".

- D. The Bidder shall provide on the outside of the sealed envelope the following information; otherwise the Bid will not be opened and will be returned to the Bidder:
1. Bidder's Name
  2. Georgia Utility Contractor License Number
  3. BID# 15-30 Annual Sanitary Sewer Rehabilitation Services
- E. If forwarded by mail, the sealed envelope containing the Bid must be enclosed in another envelope addressed to the Rockdale County Department of Finance, 958 Milstead Avenue, 3<sup>rd</sup> Floor, Room #300, P.O. Box 289, Conyers, GA 30012, Attn: Tina Malone.
- F. Any and all Bids not meeting the aforementioned criteria for Bid submittal, may be declared non-responsive, and subsequently returned to the Bidder.
- G. The Contractor, in signing a Bid on the whole or any portion of the Project, shall conform to the following requirements:
1. Bids which are not signed by individuals making them shall have attached thereto a power of attorney evidencing authority to sign the Bid in the name of the person for whom it is signed.
  2. Bids which are signed for a partnership shall be signed by all of the partners or by an attorney-in-fact. If a Bid is signed by an attorney-in-fact, there should be attached to the Bid a power of attorney executed by the partners evidencing authority to sign the Bid.
  3. Bids which are signed for a corporation shall have the correct corporate name thereof and the signature of the president or other authorized officer of the corporation manually written below the corporate name following the wording "By \_\_\_\_\_". Corporation seal shall also be affixed to the Bid.
  4. The Bidder shall complete, execute and submit the following documents, which are attached to these Contract Documents:
    - a. The Bid
    - b. The Bid Bond
    - c. Corporate Certificate, if the Bidder is a corporation
    - d. Non-Collusion Affidavit of Prime Bidder
    - e. Contractor's License Certification

#### **1.04 METHOD OF BIDDING**

The unit or lump sum price for each of the several items in the Bid of each Bidder shall include its pro rata share of overhead and profit so that the sum of the products, obtained by multiplying the quantity shown for each item by the unit price, represents the total Bid. Any Bid not conforming to this requirement may be rejected. Additionally, Unbalanced Bids will be subject to rejection. Conditional Bids will not be accepted. The special attention of all Bidders is called to this provision, for should conditions make it necessary to revise the quantities, no limit will be fixed for such increased or decreased quantities nor extra compensation allowed.

#### **1.05 ADDENDA AND INTERPRETATIONS**

- A. No interpretation of the meaning of the Drawings, Specifications or other pre-bid documents will be made to any Bidder orally.
- B. Any and all such interpretations and any supplemental instructions will be in the form of written Addenda to the Contract Documents which, if issued, will be mailed, shipped or faxed to all prospective Bidders (at the respective addresses furnished) prior to the date fixed for the opening of Bids.
- C. Failure of Bidders to receive or acknowledge any Addendum shall not relieve them of any obligation under the Bid. All Addenda shall become part of the Contract Documents.

#### **1.06 BID MODIFICATIONS**

Bidders may modify their Bid by Facsimile Transmittal at any time prior to the scheduled closing time for receipt of Bids, provided such Facsimile Transmittal is received by the Owner prior to the closing time, and provided further, the Owner is satisfied that a written confirmation of the Facsimile Transmittal modification over the signature of the Bidder was mailed prior to the closing time. The Facsimile Transmittal should not reveal the Bid price but should provide the addition or subtraction or other modification so that the final prices or terms will not be known by the Owner until the sealed Bid is opened. If written confirmation is not received within two business days from the closing time, no consideration will be given to the Facsimile Transmittal.

#### **1.07 BID SECURITY**

- A. Each Bid must be accompanied by a Bid Bond, prepared on the form of Bid Bond included herein or a Surety Company's Standard Bid Bond, duly executed by the Bidder as principal and having as surety thereon a surety company authorized to do business in the State of Georgia and listed in the latest issue of U.S. Treasury Circular 570, in the amount of 10 percent of the Bid. Attorneys-in-fact who sign



Bonds must file with each Bond a currently dated copy of their power of attorney.

- B. If for any reason whatsoever the successful Bidder withdraws from the competition after opening of the Bids, or if Bidder refuses to execute and deliver the Contract and Bonds required within 10 days after receipt of notice of the acceptance of Bid, the Owner may proceed to enforce the provisions of the Bid Bond.

#### **1.08 RECEIPT AND OPENING OF BIDS**

The Owner may consider a minor irregularity any Bid not prepared and submitted in accordance with the provisions hereof and may waive any minor irregularities or reject any and all Bids. Any Bid may be withdrawn prior to the above scheduled time for the opening of Bids or authorized postponement thereof. Any Bid received after the time and date specified shall not be opened.

#### **1.09 SUBCONTRACTS**

The Bidder is specifically advised that any person, firm or other party to whom it is proposed to award a subcontract under this Contract must be acceptable to the Owner.

#### **1.10 CONDITIONS OF THE PROJECT**

- A. Each Bidder must be informed fully of the conditions relating to the construction of the Project and the employment of labor thereon. Failure to do so will not relieve a successful Bidder of the obligation to furnish all material and labor necessary to carry out the provisions of the Contract. Insofar as possible, the Contractor, in carrying out the work, must employ such methods or means as will not cause any interruption of or interference with the work of any other Contractor.
- B. The Bidder is advised to examine the location of the Project and to be informed fully as to its conditions; the conformation of the ground; the character, quality and quantity of the products needed preliminary to and during the prosecution of the work; the general and local conditions and all other matters which can in any way affect the work to be done under the Contract. Failure to examine the site will not relieve the successful Bidder of an obligation to furnish all products and labor necessary to carry out the provisions of the Contract.
- C. The Bidder shall notify the Owner of the date and time Bidder proposes to examine the location of the Project. The Bidder shall confine examination to the specific areas designated for the proposed construction, including easements and public right-of-ways. If, due to some unforeseen reason, the Owner's proceedings for obtaining the proposed construction site (including easements), have not been completed, the Bidder may enter the site only with the express consent of the property owner. The Bidder is solely responsible for any damages caused by examination of the site.

**1.11 NOTICE OF SPECIAL CONDITIONS**

If any special federal, state, county or city laws, municipal ordinances, and the rules and regulations of any authorities having jurisdiction over construction of the Project, enclosed, herein referred to, or applicable by law to the Project, conflict with requirements of the Contract Documents, then the most stringent requirement prevails.

**1.12 OBLIGATION OF BIDDER**

By submission of a Bid, each Bidder warrants that Bidder has inspected the site and has read and is thoroughly familiar with the Contract Documents (including all addenda). The failure or omission of any Bidder to examine any form, instrument or document shall in no way relieve any Bidder from any obligation in respect to the Bid.

**1.13 METHOD OF AWARD**

- A. The contract will be awarded to the responsive, responsible Bidder submitting the Bid which is in the best interest of the Owner as determined by the Owner.
- B. The Bidder to whom the award is made will be notified. The Owner reserves the right to reject any and all Bids and to waive any minor irregularities in Bids received whenever such rejection or waiver is in the Owner's interest.
- C. A responsive Bidder shall be a pre-qualified Bidder who submits a Bid in the proper form without qualification or intent other than as called for in the Contract Documents, and who binds himself or herself on behalf of the Bid to the Owner with the proper Bid Bond completed and attached, and who properly completes all forms required to be completed and submitted at the time of the Bidding. The Bidder shall furnish all data required by these Contract Documents. Failure to do so may result in the Bid being declared non-responsive.
- D. Acceptance of the Bidder's documentation and substantiation or Contract Award by the Owner does not relieve the Bidder of liability for non-performance as covered in the Contract Documents, nor will the Bidder be exempted from any other legal recourse the Owner may elect to pursue.

END OF SECTION

**SECTION 00300  
Bid**

TO: ROCKDALE COUNTY, GEORGIA

FROM: \_\_\_\_\_

(Bidder's Name)

FOR: ROCKDALE COUNTY, GEORGIA  
ANNUAL SANITARY SEWER REHABILITATION SERVICES

Submitted: \_\_\_\_\_, 2015

The undersigned Bidder, in compliance with your Invitation to Bid for the construction of this Project having examined the Contract Documents and the site of the proposed Work, and being familiar with all of the conditions surrounding the construction of the proposed Project, including the availability of materials and labor, hereby proposes to construct the Project in accordance with the Contract Documents.

The Bidder proposes and agrees, if this Bid is accepted, to contract with Rockdale County, Georgia in the form of Contract Agreement specified, to furnish all necessary products, machinery, tools, apparatus, means of transportation and labor necessary to complete the construction of the Work in full and complete accordance with the reasonably intended requirements of the Contract Documents to the full and entire satisfaction of Rockdale County, Georgia with a definite understanding that no money will be allowed for extra work except as set forth in the Contract Documents, for the following prices:

## BID FORM

### ANNUAL SANITARY SEWER REHABILITATION SERVICES

Department of Water Resources

ITEM #	DESCRIPTION (include all expenses, overhead and profit)	APPROX. QTY	UNIT PRICE	TOTAL PRICE
<b>CHEMICAL ROOT CONTROL</b>				
1	Up to 8"	100	LF	
2	10" - 12"	100	LF	
3	14" - 17"	100	LF	
4	18" - 24"	100	LF	
<b>BYPASS PUMPING</b>				
5	Setup for 3" - 6" Pump	5	EA	
6	Setup for 8" - 12" Pump	5	EA	
7	Discharge Line for 3" - 6" Pump	100	LF	
8	Discharge Line for 8" - 12" Pump	100	LF	
9	Operation of 3" - 6" Pump	10	HR	
10	Operation of 6" - 12" Pump	10	HR	
<b>PIPE REHABILITATION Cured in Place Pipe (CIPP) - Full Length</b>				
11	6" x 4.5 mm CIPP	100	LF	
12	8" x 6.0 mm CIPP	100	LF	
13	10" x 6.0 mm CIPP	100	LF	
14	12" x 6.0 mm CIPP	100	LF	
15	14" x 6.0 mm CIPP	10	LF	
16	15" x 6.0 mm CIPP	10	LF	
15	16" x 6.0 mm CIPP	10	LF	
18	18" x 7.5 mm CIPP	10	LF	
19	20" x 7.5 mm CIPP	10	LF	
20	24" x 9.0 mm CIPP	10	LF	
21	30" x 12.0 mm CIPP	10	LF	
22	Additional Cost per 1.5 mm Thickness 8" diameter	1	LF	
23	Additional Cost per 1.5 mm Thickness 10" diameter	1	LF	
24	Additional Cost per 1.5 mm Thickness 12" diameter	1	LF	
25	Additional Cost per 1.5 mm Thickness 14" diameter	1	LF	

26	Additional Cost per 1.5 mm Thickness 15" diameter	1	LF		
27	Additional Cost per 1.5 mm Thickness 16" diameter	1	LF		
28	Additional Cost per 1.5 mm Thickness 18" diameter	1	LF		
29	Additional Cost per 1.5 mm Thickness 20" diameter	1	LF		
30	Additional Cost per 1.5 mm Thickness 24" diameter	1	LF		
31	Additional Cost per 1.5 mm Thickness 30" diameter	1	LF		
32	Service Lateral Reinstatement - Remote	1	EA		
33	Service Lateral Reinstatement - Man Entry	1	EA		
<b>Service Lateral Rehabilitation with CIPP</b>					
34	4" x 4.5 mm CIPP	1	EA		
35	4" CIPP over 15' in length	1	LF		
36	6" x 4.5 mm CIPP	1	EA		
37	6' CIPP over 15' in length	1	LF		
38	PVC Cleanout Installation (Traditional Excavation)	1	EA		
39	PVC Cleanout Installation (Trenchless or Vacuum)	1	EA		
<b>Pipebursting - Full Length 0' - 10' depth installing HDPE Pipe</b>					
40	Insertion/Receiving Pit	1	EA		
41	Service Reinstatement	10	EA		
42	6"	1,000	LF		
43	8"	1	LF		
44	10"	1,000	LF		
45	12"	1	LF		
46	14"	1	LF		
47	15"	1	LF		
48	16"	1	LF		
49	18"	1	LF		
50	20"	1	LF		
51	24"	1	LF		
52	30"	1	LF		
<b>&gt;10' - 15' depth installing HDPE Pipe</b>					
53	Insertion/Receiving Pit	2	EA		
54	Service Reinstatement	4	EA		
55	6"	1	LF		
56	8"	1	LF		
57	10"	1	LF		
58	12"	1	LF		
59	14"	1	LF		
60	15"	1	LF		
61	16"	1	LF		
62	18"	1	LF		

63	20"	1	LF		
64	24"	1	LF		
65	30"	1	LF		
	<b>&gt;15' - 20' depth installing HDPE Pipe</b>				
66	Insertion/Receiving Pit	1	EA		
67	Service Reinstatement	2	EA		
68	6"	1	LF		
69	8"	1	LF		
70	10"	1	LF		
71	12"	1	LF		
72	14"	1	LF		
73	15"	1	LF		
74	16"	1	LF		
75	18"	1	LF		
76	20"	1	LF		
77	24"	1	LF		
78	30"	1	LF		
	<b>&gt;20' - 25' depth installing DHPE Pipe</b>				
79	Insertion/Receiving Pit	1	EA		
80	Service Reinstatement	2	EA		
81	6"	1	LF		
82	8"	1	LF		
83	10"	1	LF		
84	12"	1	LF		
85	14"	1	LF		
86	15"	1	LF		
87	16"	1	LF		
88	18"	1	LF		
89	20"	1	LF		
90	24"	1	LF		
91	30"	1	LF		
	<b>POINT REPAIRS - UNPAVED AREAS</b> <b>Depth of Cut for 8" PVC, 0 - 10' of length</b>				
92	0 - 8'	15	EA		
93	8.01 - 10'	5	EA		
94	10.01 - 12'	5	EA		
95	12.01 - 14'	3	EA		
96	14.01 - 16'	3	EA		
97	16.01 - 18'	2	EA		
98	18.01 - 20'	2	EA		
99	20.01 - 22'	1	EA		
100	22.01 - 24'	1	EA		
101	24.01 - 26'	1	EA		
102	DIP as an extra	50	LF		
	<b>8" PVC Per LF over 10' of length</b>				
103	0 - 8'	100	LF		

104	8.01 - 10'	100	LF		
105	10.01 - 12'	12	LF		
106	12.01 - 14'	1	LF		
107	14.01 - 16'	1	LF		
108	16.01 - 18'	1	LF		
109	18.01 - 20'	1	LF		
110	20.01 - 22'	1	LF		
111	22.01 - 24'	1	LF		
112	24.01 - 26'	1	LF		
113	DIP as an extra	50	LF		
	<b>Depth of Cut for 10" PVC, 0 - 10' of length</b>				
114	0 - 8'	2	EA		
115	8.01 - 10'	2	EA		
116	10.01 - 12'	1	EA		
117	12.01 - 14'	1	EA		
118	14.01 - 16'	1	EA		
119	16.01 - 18'	1	EA		
	<b>DESCRIPTION - include all expenses, overhead and profit</b>				
120	18.01 - 20'	1	EA		
121	20.01 - 22'	1	EA		
122	22.01 - 24'	1	EA		
123	24.01 - 26'	1	EA		
124	DIP as an extra	1	LF		
	<b>10" PVC Per LF over 10' of length</b>				
125	0 - 8'	1	LF		
126	8.01 - 10'	1	LF		
127	10.01 - 12'	30	LF		
128	12.01 - 14'	1	LF		
129	14.01 - 16'	1	LF		
130	16.01 - 18'	1	LF		
131	18.01 - 20'	1	LF		
132	20.01 - 22'	1	LF		
133	22.01 - 24'	1	LF		
134	24.01 - 26'	1	LF		
135	DIP as an extra	1	LF		
	<b>Depth of Cut for 12" PVC, 0 - 10' of length</b>				
136	0 - 8'	1	EA		
137	8.01 - 10'	1	EA		
138	10.01 - 12'	1	EA		
139	12.01 - 14'	1	EA		
140	14.01 - 16'	1	EA		
141	16.01 - 18'	1	EA		
142	18.01 - 20'	1	EA		
143	20.01 - 22'	1	EA		
144	22.01 - 24'	1	EA		
145	24.01 - 26'	1	EA		

146	DIP as an extra	1	LF		
<b>12" PVC Per LF over 10' of length</b>					
147	0 - 8'	1	LF		
148	8.01 - 10'	1	LF		
149	10.01 - 12'	1	LF		
150	12.01 - 14'	1	LF		
151	14.01 - 16'	1	LF		
152	16.01 - 18'	1	LF		
153	18.01 - 20'	1	LF		
154	20.01 - 22'	1	LF		
155	22.01 - 24'	1	LF		
156	24.01 - 26'	1	LF		
157	DIP as an extra	1	LF		
<b>Depth of Cut for 14" PVC, 0 - 10' of length</b>					
158	0 - 8'	1	EA		
159	8.01 - 10'	1	EA		
160	10.01 - 12'	1	EA		
161	12.01 - 14'	1	EA		
162	14.01 - 16'	1	EA		
163	16.01 - 18'	1	EA		
164	18.01 - 20'	1	EA		
165	20.01 - 22'	1	EA		
166	22.01 - 24'	1	EA		
167	24.01 - 26'	1	EA		
168	DIP as an extra	1	LF		
<b>14" PVC Per LF over 10' of length</b>					
169	0 - 8'	1	LF		
170	8.01 - 10'	1	LF		
171	10.01 - 12'	1	LF		
172	12.01 - 14'	1	LF		
173	14.01 - 16'	1	LF		
174	16.01 - 18'	1	LF		
175	18.01 - 20'	1	LF		
176	20.01 - 22'	1	LF		
177	22.01 - 24'	1	LF		
178	24.01 - 26'	1	LF		
179	DIP as an extra	1	LF		
<b>Depth of Cut for 15" PVC, 0 - 10' of length</b>					
180	0 - 8'	1	EA		
181	8.01 - 10'	1	EA		
182	10.01 - 12'	1	EA		
183	12.01 - 14'	1	EA		
184	14.01 - 16'	1	EA		
185	16.01 - 18'	1	EA		
186	18.01 - 20'	1	EA		
187	20.01 - 22'	1	EA		



188	22.01 - 24'	1	EA		
189	24.01 - 26'	1	EA		
190	DIP as an extra	1	LF		
	<b>15" PVC Per LF over 10' of length</b>				
191	0 - 8'	1	LF		
192	8.01 - 10'	1	LF		
193	10.01 - 12'	1	LF		
194	12.01 - 14'	1	LF		
195	14.01 - 16'	1	LF		
196	16.01 - 18'	1	LF		
197	18.01 - 20'	1	LF		
198	20.01 - 22'	1	LF		
199	22.01 - 24'	1	LF		
200	24.01 - 26'	1	LF		
201	DIP as an extra	1	LF		
	<b>Depth of Cut for 16" PVC, 0 - 10' of length</b>				
202	0 - 8'	1	EA		
203	8.01 - 10'	1	EA		
204	10.01 - 12'	1	EA		
205	12.01 - 14'	1	EA		
206	14.01 - 16'	1	EA		
207	16.01 - 18'	1	EA		
208	18.01 - 20'	1	EA		
209	20.01 - 22'	1	EA		
210	22.01 - 24'	1	EA		
211	24.01 - 26'	1	EA		
212	DIP as an extra	1	LF		
	<b>16" PVC Per LF over 10' of length</b>				
213	0 - 8'	1	LF		
214	8.01 - 10'	1	LF		
215	10.01 - 12'	1	LF		
216	12.01 - 14'	1	LF		
217	14.01 - 16'	1	LF		
218	16.01 - 18'	1	LF		
219	18.01 - 20'	1	LF		
220	20.01 - 22'	1	LF		
221	22.01 - 24'	1	LF		
222	24.01 - 26'	1	LF		
223	DIP as an extra	1	LF		
	<b>Depth of Cut for 18" DIP, 0 - 10' of length</b>				
224	0 - 8'	1	EA		
225	8.01 - 10'	1	EA		
226	10.01 - 12'	1	EA		
227	12.01 - 14'	1	EA		
228	14.01 - 16'	1	EA		
229	16.01 - 18'	1	EA		

230	18.01 - 20'	1	EA		
231	20.01 - 22'	1	EA		
232	22.01 - 24'	1	EA		
233	24.01 - 26'	1	EA		
	<b>18" DIP Per LF over 10' of length</b>				
234	0 - 8'	1	LF		
235	8.01 - 10'	1	LF		
236	10.01 - 12'	1	LF		
237	12.01 - 14'	1	LF		
238	14.01 - 16'	1	LF		
239	16.01 - 18'	1	LF		
240	18.01 - 20'	1	LF		
241	20.01 - 22'	1	LF		
242	22.01 - 24'	1	LF		
243	24.01 - 26'	1	LF		
	<b>Depth of Cut for 20" DIP, 0 - 10' of length</b>				
244	0 - 8'	1	EA		
245	8.01 - 10'	1	EA		
246	10.01 - 12'	1	EA		
247	12.01 - 14'	1	EA		
248	14.01 - 16'	1	EA		
249	16.01 - 18'	1	EA		
250	18.01 - 20'	1	EA		
251	20.01 - 22'	1	EA		
252	22.01 - 24'	1	EA		
253	24.01 - 26'	1	EA		
	<b>20" DIP Per LF over 10' of length</b>				
254	0 - 8'	1	LF		
255	8.01 - 10'	1	LF		
256	10.01 - 12'	1	LF		
257	12.01 - 14'	1	LF		
258	14.01 - 16'	1	LF		
259	16.01 - 18'	1	LF		
260	18.01 - 20'	1	LF		
261	20.01 - 22'	1	LF		
262	22.01 - 24'	1	LF		
263	24.01 - 26'	1	LF		
	<b>Depth of Cut for 24" DIP, 0 - 10' of length</b>				
264	0 - 8'	1	EA		
265	8.01 - 10'	1	EA		
266	10.01 - 12'	1	EA		
267	12.01 - 14'	1	EA		
268	14.01 - 16'	1	EA		
269	16.01 - 18'	1	EA		
270	18.01 - 20'	1	EA		
271	20.01 - 22'	1	EA		

272	22.01 - 24'	1	EA		
273	24.01 - 26'	1	EA		
<b>24" DIP Per LF over 10' of length</b>					
274	0 - 8'	1	LF		
275	8.01 - 10'	1	LF		
276	10.01 - 12'	1	LF		
277	12.01 - 14'	1	LF		
278	14.01 - 16'	1	LF		
279	16.01 - 18'	1	LF		
280	18.01 - 20'	1	LF		
281	20.01 - 22'	1	LF		
282	22.01 - 24'	1	LF		
283	24.01 - 26'	1	LF		
<b>Depth of Cut for 30" DIP, 0 - 10' of length</b>					
284	0 - 8'	1	EA		
285	8.01 - 10'	1	EA		
286	10.01 - 12'	1	EA		
287	12.01 - 14'	1	EA		
288	14.01 - 16'	1	EA		
289	16.01 - 18'	1	EA		
290	18.01 - 20'	1	EA		
291	20.01 - 22'	1	EA		
292	22.01 - 24'	1	EA		
293	24.01 - 26'	1	EA		
<b>30" DIP Per LF over 10' of length</b>					
294	0 - 8'	1	LF		
295	8.01 - 10'	1	LF		
296	10.01 - 12'	1	LF		
297	12.01 - 14'	1	LF		
298	14.01 - 16'	1	LF		
299	16.01 - 18'	1	LF		
300	18.01 - 20'	1	LF		
301	20.01 - 22'	1	LF		
302	22.01 - 24'	1	LF		
303	24.01 - 26'	1	LF		
<b>INTERNAL MECHANICAL POINT REPAIR</b>					
304	8" Internal Seal	1	EA		
305	10" Internal Seal	1	EA		
306	12" Internal Seal	1	EA		
307	14" Internal Seal	1	EA		
308	15" Internal Seal	1	EA		
309	16" Internal Seal	1	EA		
310	18" Internal Seal	1	EA		
311	20" Internal Seal	1	EA		
312	24" Internal Seal	1	EA		
313	30" Internal Seal	1	EA		

<b>Manhole Repair / Rehabilitation UNPAVED AREAS</b>					
314	Repair Manhole Bench/Table and Invert	10	EA		
315	48" diameter - Cementitious Rehabilitation	50	VF		
316	60" diameter - Cementitious Rehabilitation	1	VF		
317	72" diameter - Cementitious Rehabilitation	8	VF		
318	48" diameter - Epoxy/Urethane Rehabilitation	150	VF		
319	60" diameter - Epoxy/Urethane Rehabilitation	1	VF		
320	72" diameter - Epoxy/Urethane Rehabilitation	8	VF		
321	48" diameter - Fiberglass Insert	1	VF		
322	60" diameter - Fiberglass Insert	1	VF		
323	72" diameter - Fiberglass Insert	1	VF		
324	48" diameter - Polymer Cement Manhole	1	VF		
325	60" diameter - Polymer Cement Manhole	1	VF		
326	72" diameter - Polymer Cement Manhole	1	VF		
327	Mortar Grout Lift Holes	50	EA		
328	Mortar Grout Manhole Crack/Joints	500	LF		
329	Pressure Grout Pipe Seal	1	EA		
330	Pressure Grout Manhole Crack/Joint	1	EA		
331	Grout used	1	GAL		
<b>Manhole Adjustment UNPAVED AREAS</b>					
332	Internal manhole Frame seal	1	EA		
333	External manhole Frame seal	1	EA		
334	Re-set existing manhole Frame & Cover	10	EA		
335	Remove existing manhole Frame & Cover and replace w/ standard Frame & Cover	10	EA		
336	Remove existing manhole Frame & Cover and replace w/ watertight (bolt down) Frame & Cover	10	EA		
337	Locate and expose buried manhole	20	EA		
338	Adjust elevation of manhole Frame & Cover up to 1.0 feet using brick	10	EA		
<b>Install 1.0' vertical riser pre-cast manhole barrel section</b>					
339	48" diameter	1	EA		
340	60" diameter	1	EA		
341	72" diameter	1	EA		
<b>Install 2.0' vertical riser pre-cast manhole barrel section</b>					
342	48" diameter	1	EA		
343	60" diameter	1	EA		
344	72" diameter	1	EA		
<b>Install 4.0' vertical riser pre-cast manhole barrel section</b>					
345	48" diameter	1	EA		
346	60" diameter	1	EA		

347	72" diameter	1	EA		
348	Lower existing manhole Frame & Cover elevation by up to 1.0 foot by removal of brick & re-install Frame & Cover	1	EA		
	<b>Lower existing manhole Frame &amp; Cover elevation by removal of pre-cast manhole barrel section &amp; re-install Frame &amp; Cover</b>				
349	1.0 vertical foot	1	EA		
350	2.0 vertical foot	1	EA		
351	4.0 vertical foot	1	EA		
	<b>Manhole Replacement/New Manhole Installation UNPAVED AREAS 48" diameter</b>				
352	0 - 8'	8	VF		
353	8.01 - 10'	10	VF		
354	10.01 - 12'	12	VF		
355	12.01 - 14'	1	VF		
356	14.01 - 16'	1	VF		
357	16.01 - 18'	1	VF		
358	18.01 - 20'	1	VF		
359	20.01 - 22'	1	VF		
360	22.01 - 24'	1	VF		
361	24.01 - 26'	1	VF		
	<b>60" diameter</b>				
362	0 - 8'	1	VF		
363	8.01 - 10'	1	VF		
364	10.01 - 12'	1	VF		
365	12.01 - 14'	1	VF		
366	14.01 - 16'	1	VF		
367	16.01 - 18'	1	VF		
368	18.01 - 20'	1	VF		
369	20.01 - 22'	1	VF		
370	22.01 - 24'	1	VF		
371	24.01 - 26'	1	VF		
	<b>72" diameter</b>				
372	0 - 8'	1	VF		
373	8.01 - 10'	1	VF		
374	10.01 - 12'	1	VF		
375	12.01 - 14'	1	VF		
376	14.01 - 16'	1	VF		
377	16.01 - 18'	1	VF		
378	18.01 - 20'	1	VF		
379	20.01 - 22'	1	VF		
380	22.01 - 24'	1	VF		
381	24.01 - 26'	1	VF		
	<b>Easement Clearing</b>				

382	Light Easement Clearing by Machine	100	SY		
383	Medium Easement Clearing by Machine	100	SY		
384	Heavy Easement Clearing by Machine	100	SY		
385	Light Easement Clearing by Hand	100	SY		
386	Medium Easement Clearing by Hand	100	SY		
387	Heavy Easement Clearing by Hand	100	SY		
388	Selective Tree Clearing - 0"-14"	10	EA		
389	Selective Tree Clearing - 15"-24"	10	EA		
390	Selective Tree Clearing - 25"-36"	10	EA		
391	Stump Grinding	1	Hour		
392	Debris Chipping	1	Hour		
393	Seed and Fertilize	100	SY		
394	Mulching	100	SY		
395	Solid Sod	100	SY		
396	Top Soil in place	10	CY		
	<b>Miscellaneous</b>				
397	Back Fill (sand / clay)	1	TON		
398	Remove and Reset Fencing	75	LF		
399	Remove and replace curb and gutter	30	LF		
400	Remove and replace concrete sidewalk	10	SY		
401	Remove and replace driveways	20	SY		
402	Stone Bedding and Backfill	1	TON		
403	Surface stone for site access	1	TON		
404	Rip rap	10	SY		
405	Standard slope matting	10	SY		
406	Remove and replace asphalt roadway	10	SY		
407	Concrete surface restoration	10	SY		
408	Remove and replace roadway concrete sub-base	10	SY		
409	Remove and replace roadway crushed rock sub base	10	SY		
410	Compact backfill to 95% as determined by modified Proctor ASTM Des D1557-70	10	LF		
411	Tree save/orange fence	100	LF		
412	Hay Bales	4	EA		
413	Silt Fencing - Type "A"	300	LF		
414	Silt Fencing - Type "C"	1	LF		
415	Roadway for temporary access	10	SY		
	<b>Total</b>				

**TOTAL UNIT PRICE BASE BID, ITEMS 1 THRU 415**

**BID TOTAL**

BID TOTAL, ITEMS 1 THROUGH 415, THE AMOUNT OF \_\_\_\_\_  
\_\_\_\_\_ DOLLARS (\$ \_\_\_\_\_).

The Bidder declares an understanding that the quantities shown for unit price items are subject to either increase or decrease, and that should the quantities of any of the items of Work be increased, the Bidder proposes to do the additional Work at the unit prices stated herein; and should the quantities be decreased, the Bidder also understands that payment will be made on the basis of actual quantities at the unit price bid and will make no claim for additional costs or anticipated profits for any decrease in quantities; and that actual quantities will be determined upon completion of Work, at which time adjustment will be made to the Contract amount by direct increase or decrease. No guarantee can be made as to the number, size or value or type of scope of projects that may be assigned under this contract. Bidders must take into consideration that any combination of bid items may be assigned as a work package. Bidders are cautioned to price bid items in a balanced manner such that the costs of the items appropriately stand alone or in a combination with other items.

The Contract will be awarded to the lowest responsive, responsible Bidder whose Total Unit Price Base Bid as offered in the Bid Form represents the lowest total price and complies with the conditions of the Bid, provided the bid is reasonable and it is to the best interest of the Owner to accept it.

The Bidder further understands that each of the projects will be assigned by a Work Order, which will specify the required project completion date. The undersigned further agrees to complete the work as bid within the assigned calendar days after receipt of Work Order. As the time allotted for the completion of the Work is of the essence, if the work is not completed within specified time for the completion of the Work, there shall be deducted from the contract price, not as a penalty but as liquidated damages, **\$500.00** for each and every calendar day of delay in the completion of the work beyond the time specified, subject to all the terms of the General Conditions.

In case of discrepancies between the figures shown in the unit prices and the totals, the unit prices shall apply and the totals shall be corrected to agree with the unit prices. In case of discrepancies between written amounts and figures, written amounts shall take precedence over figures and the sum of all Bid extensions (of unit prices) plus lump sum items shall take precedence over BID TOTAL.

The Bidder furthermore agrees that, in the case of a failure to execute the Contract Agreement and Bonds within ten days after receipt of conformed Contract Documents for execution, the attached Bid Bond accompanying this Bid and the monies payable thereon shall be paid into the funds of the Owner as liquidated damages for such failure.

Attached hereto is a Bid Bond for the sum of \_\_\_\_\_ Dollars (\$ \_\_\_\_\_) according to the conditions of "Instructions to Bidders" and provisions thereof.

Bidder acknowledges receipt of the Following Addenda:

Addendum No. 1, dated: \_\_\_\_\_

Addendum No. 2, dated: \_\_\_\_\_

Addendum No. 3, dated: \_\_\_\_\_

Addendum No. 4, dated: \_\_\_\_\_

Addendum No. 5, dated: \_\_\_\_\_

Addendum No. 6, dated: \_\_\_\_\_

**BIDDER:**

By:

Name:

(Print or Type)

Title:

Address:

Phone: \_

Attest:

Name: \_

(Print or Type)

Title:

(SEAL)



Note: Attest for a corporation must be by the corporate secretary; for a partnership by another partner; for an individual by a notary.

Note: If the Bidder is a corporation, the Bid shall be signed by an officer of the corporation; if a partnership, it shall be signed by a partner. If signed by others, authority for signature shall be attached.

The full names and addresses of persons or parties interested in the foregoing Bid, as principals, are as follows:

<u>Name</u>	<u>Address</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

END OF SECTION

**SECTION 00410**  
**Bid Bond**

STATE OF GEORGIA

COUNTY OF ROCKDALE

KNOW ALL MEN BY THESE PRESENTS, that we, \_\_\_\_\_, as Principal, and \_\_\_\_\_, as Surety, are held and firmly bound unto Rockdale County, Georgia in the sum of \_\_\_\_\_ Dollars (\$\_\_\_\_\_) lawful money of the United States of America, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, personal representatives, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted to the Owner a Bid for construction of “Annual Sanitary Sewer Rehabilitation Services” in Rockdale County, Georgia.

NOW THEREFORE, the conditions of this obligation are such that if the Bid be accepted, the Principal shall, within ten days after receipt of conformed Contract Documents, execute a Contract in accordance with the Bid upon the terms, conditions and prices set forth therein, and in the form and manner required by the Contract Documents and execute sufficient and satisfactory separate Performance and Payment Bonds payable to the Owner, each in an amount of 100 percent of the total Contract Price, in form satisfactory to the Owner, then this obligation shall be void; otherwise, it shall be and remain in full force and effect in law; and the Surety shall, upon failure of the Principal to comply with any or all of the foregoing requirements within the time specified above, immediately pay to the aforesaid Owner, upon demand, the amount hereof in good and lawful money of the United States of America, not as a penalty, but as liquidated damages.

This bond is given pursuant to and in accordance with the provisions of O.C.G.A. Section 36-10-1 et. seq. and all the provisions of the law referring to this character of bond as set forth in said Sections or as may be hereinafter enacted and these are hereby made a part hereof to the same extent as if set out herein in full.

IN WITNESS WHEREOF, the said Principal has hereunder affixed its signature and seal, and said Surety has hereunto caused to be affixed its corporate signature and seal, by its duly authorized officers, on this \_\_\_\_\_ day of \_\_\_\_\_, 2015.

**CONTRACTOR - PRINCIPAL: \_**

By:

Name:

(Print or Type)

Address:

Phone:

Attest:

Name:

(Print or Type)

Title:

(SEAL)

Note: Attest for a corporation must be by the corporate secretary; for a partnership by another partner; for an individual by a notary.

**SURETY: \_**

By:

Name:

(Print or Type)

Title:

Phone:

Attest:

Name:

(Print or Type)

Title:

(SEAL)

Note: Surety companies executing bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the Project is located.

Resident agent in state in which Work is to be performed:

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Phone: \_\_\_\_\_

END OF SECTION

**SECTION 00422  
Corporate Certificate**

I, \_\_\_\_\_, certify that I am the Secretary of the Corporation named as Contractor in the foregoing Bid; that \_\_\_\_\_, who signed said Bid on behalf of the Contractor was then \_\_\_\_\_ of said Corporation; that said Bid was duly signed for and on behalf of said Corporation by authority of its Board of Directors, and is within the scope of its corporate powers; that said Corporation is organized under the laws of the State of \_\_\_\_\_.

This \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_

(Corporate Secretary)

(SEAL)

END OF SECTION

**SECTION 00425**  
**Contractor's License Certification**

Contractor's Name: \_\_\_\_\_

Georgia Utility Contractor's License Number: \_\_\_\_\_

Expiration Date of License: \_\_\_\_\_

I certify that the above information is true and correct and that the classification noted is applicable to the Bid for this Project.

Signed:

Printed:

Date:

END OF SECTION

**SECTION 00480**  
**Non-Collusion Affidavit of Prime Bidder**

STATE OF \_\_\_\_\_

COUNTY OF \_\_\_\_\_

\_\_\_\_\_, being first duly sworn, deposes and says that:

He or she is \_\_\_\_\_

(Owner, Partner, Officer, Representative or Agent)

of \_\_\_\_\_, the Bidder that has submitted the attached Bid;

He or she is fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances respecting such Bid;

Such Bid is genuine and is not a collusive or sham Bid;

Neither the said Bidder nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this Affiant, has in any way colluded, conspired, connived or agreed, directly or indirectly with any other Bidder, firm or person to submit a collusive or sham Bid in connection with the Contract for which the attached Bid has been submitted or to refrain from bidding in connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Bidder, firm or person to fix the price or prices in the attached Bid or of any other Bidder, or to fix any overhead, profit or cost element of the Bid price or the Bid price of any other Bidder, or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against Rockdale County, Georgia or any person interested in the proposed Contract; and

The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this Affiant.

(Signed) \_\_\_\_\_

(Title) \_\_\_\_\_

Subscribed and Sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_, 2015.

\_\_\_\_\_ My Commission Expires:

(Notary Public)

(SEAL)

END OF SECTION

**SECTION 00485**  
**NON-COLLUSION AFFIDAVIT OF SUB-CONTRACTOR**

**ROCKDALE COUNTY BOARD OF COMMISSIONERS**  
**NON-COLLUSION AFFIDAVIT OF SUB-CONTRACTOR**

State of \_\_\_\_\_)

County of \_\_\_\_\_)

\_\_\_\_\_, being first duly sworn, deposes and says that:

(1) He/She is \_\_\_\_\_ (owner, partner officer, representative, or

agent) of \_\_\_\_\_, the sub-contractor that has submitted the attached bid;

(2) He is fully informed respecting the preparation and contents of the attached bid and of all pertinent circumstances respecting such bid;

(3) Such bid is genuine and is not a collusive or sham bid;

(4) Neither the said sub-contractor nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affidavit, has in any way colluded, conspired, connived or agreed, directly or indirectly with any other Vendor, firm or person to submit a collusive or sham bid in connection with the Contract for which the attached bid has been submitted or refrain from proposing in connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Vendor, firm or person to fix the price or prices in the attached bid or of any other Vendor, or to fix any overhead, profit or cost element of the proposing price or the proposing price of any other Vendor, or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against Rockdale County or any person interested in the proposed Contract; and

(5) The price or prices quoted in the attached bid are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the sub-contractor or any of its agents, representatives, owners, employees, or parties in interest, including this affidavit.

\_\_\_\_\_  
(Signed)



\_\_\_\_\_  
(Title)

Subscribed and Sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_.

Name \_\_\_\_\_

Title \_\_\_\_\_

My commission expires (Date)

**SECTION 00490  
Contractor Affidavit**

**Contractor Affidavit under O.C.G.A. §13-10-91(b)(1)**

By executing this affidavit, the undersigned contractor verifies its compliance with O.C.G.A. §13-10-91, stating affirmatively that the individual, firm or corporation which is engaged in the physical performance of services on behalf of (name of public employer) has registered with, is authorized to use and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in O.C.G.A. §13-10-91. Furthermore, the undersigned contractor will continue to use the federal work authorization program throughout the contract period and the undersigned contractor will contract for the physical performance of services in satisfaction of such contract only with subcontractors who present an affidavit to the contractor with the information required by O.C.G.A. §13-10-91(b). Contractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

\_\_\_\_\_  
Federal Work Authorization User Identification Number

\_\_\_\_\_  
Date of Authorization

\_\_\_\_\_  
Name of Contractor

\_\_\_\_\_  
Name of Project

\_\_\_\_\_  
Name of Public Employer

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

Executed on \_\_\_\_\_, \_\_\_\_, 201\_\_ in \_\_\_\_\_(city), \_\_\_\_\_(state).

\_\_\_\_\_  
Signature of Authorized Officer or Agent

\_\_\_\_\_  
Printed Name and Title of Authorized Officer or Agent

SUBSCRIBED AND SWORN BEFORE ME  
ON THIS THE \_\_\_\_\_ DAY OF \_\_\_\_\_, 201\_\_.

---

NOTARY PUBLIC  
My Commission Expires:

---

**SECTION 00490  
CONTRACTOR AFFIDAVIT**

**Subcontractor Affidavit under O.C.G.A. § 13-10-91(b)(3)**

By executing this affidavit, the undersigned subcontractor verifies its compliance with O.C.G.A. § 13-10-91, stating affirmatively that the individual, firm or corporation which is engaged in the physical performance of services under a contract with (name of contractor) on behalf of (name of public employer) has registered with, is authorized to use and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in O.C.G.A. § 13-10-91. Furthermore, the undersigned subcontractor will continue to use the federal work authorization program throughout the contract period and the undersigned subcontractor will contract for the physical performance of services in satisfaction of such contract only with sub-subcontractors who present an affidavit to the subcontractor with the information required by O.C.G.A. § 13-10-91(b). Additionally, the undersigned subcontractor will forward notice of the receipt of an affidavit from a sub-subcontractor to the contractor within five business days of receipt. If the undersigned subcontractor receives notice that a sub-subcontractor has received an affidavit from any other contracted sub-subcontractor, the undersigned subcontractor must forward, within five business days of receipt, a copy of the notice to the contractor. Subcontractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

\_\_\_\_\_  
Federal Work Authorization User Identification Number

\_\_\_\_\_  
Date of Authorization

\_\_\_\_\_  
Name of Subcontractor

\_\_\_\_\_  
Name of Project

\_\_\_\_\_  
Name of Public Employer

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

Executed on \_\_\_\_\_, \_\_\_\_, 201\_\_ in \_\_\_\_\_(city), \_\_\_\_\_(state).

\_\_\_\_\_  
Signature of Authorized Officer or Agent

\_\_\_\_\_  
Printed Name and Title of Authorized Officer or Agent

SUBSCRIBED AND SWORN BEFORE ME  
ON THIS THE \_\_\_\_\_ DAY OF \_\_\_\_\_, 201\_\_.

\_\_\_\_\_  
NOTARY PUBLIC  
My Commission Expires:  
\_\_\_\_\_

## **Sub-subcontractor Affidavit under O.C.G.A. §13-10-91(b)(4)**

By executing this affidavit, the undersigned sub-subcontractor verifies its compliance with O.C.G.A. §13-10-91, stating affirmatively that the individual, firm or corporation which is engaged in the physical performance of services under a contract for (name of subcontractor or sub-subcontractor with whom such sub-subcontractor has privity of contract) and (name of contractor) on behalf of (name of public employer) has registered with, is authorized to use and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in O.C.G.A. §13-10-91. Furthermore, the undersigned sub-subcontractor will continue to use the federal work authorization program throughout the contract period and the undersigned sub-subcontractor will contract for the physical performance of services in satisfaction of such contract only with sub-subcontractors who present an affidavit to the sub-subcontractor with the information required by O.C.G.A. §13-10-91(b). The undersigned sub-subcontractor shall submit, at the time of such contract, this affidavit to (name of subcontractor or sub-subcontractor with whom such sub-subcontractor has privity of contract). Additionally, the undersigned sub-subcontractor will forward notice of the receipt of any affidavit from a sub-subcontractor to (name of subcontractor or sub-subcontractor with whom such sub-subcontractor has privity of contract). Sub-subcontractors hereby attest that its federal work authorization user identification number and date of authorization are as follows:

\_\_\_\_\_  
Federal Work Authorization User Identification Number

\_\_\_\_\_  
Date of Authorization

\_\_\_\_\_  
Name of Sub-Subcontractor

\_\_\_\_\_  
Name of Project

\_\_\_\_\_  
Name of Public Employer

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

Executed on \_\_\_\_\_, \_\_\_\_, 201\_\_ in \_\_\_\_\_(city), \_\_\_\_\_(state).

\_\_\_\_\_  
Signature of Authorized Officer or Agent

\_\_\_\_\_  
Printed Name and Title of Authorized Officer or Agent

SUBSCRIBED AND SWORN BEFORE ME  
ON THIS THE \_\_\_\_\_ DAY OF \_\_\_\_\_, 201\_\_.

\_\_\_\_\_  
NOTARY PUBLIC  
My Commission Expires: \_\_\_\_\_

**SECTION 00490**  
**AFFIDAVIT VERIFYING STATUS**

**Affidavit Verifying Status  
for County Public Benefit Application**

By executing this affidavit under oath, as an applicant for the award of a contract with Rockdale, County Georgia, I \_\_\_\_\_. [Name of natural person applying on behalf of individual, business, corporation, partnership, or other private entity] am stating the following as required by O.C.G.A. Section 50-36-1:

1) \_\_\_\_\_ I am a United States citizen

**OR**

2) \_\_\_\_\_ I am a legal permanent resident 18 years of age or older or I am an otherwise qualified alien or non-immigrant under the Federal Immigration and Nationality Act 18 years of age or older and lawfully present in the United States.\*

In making the above representation under oath, I understand that any person who knowingly and willfully makes a false, fictitious, or fraudulent statement or representation in an affidavit shall be guilty of a violation of Code Section 16-10-20 of the Official Code of Georgia.

\_\_\_\_\_  
Signature of Applicant:

\_\_\_\_\_  
Date

\_\_\_\_\_  
Printed Name:

\*\_\_\_\_\_  
Alien Registration number for non-citizens



SUBSCRIBED AND SWORN  
BEFORE ME ON THIS THE  
\_\_\_\_\_ DAY OF \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
Notary Public

My commission Expires:

**\*Note:** O.C.G.A. § 50-36-1(e)(2) requires that aliens under the federal Immigration and Nationality Act, Title 8 U.S.C., as amended, provide their registration number. Because legal permanent residents are included in the federal definition of “alien”, legal permanent residents must also provide their alien registration number. Qualified aliens that do not have an alien registration number may supply another identifying number below.

\_\_\_\_\_

**SECTION 00500  
CONTRACT AGREEMENT**

This Contract Agreement made and entered into on the \_\_\_\_\_ day of \_\_\_\_\_, 2015 by and between Rockdale County, Georgia, party of the first part (hereinafter called the "Owner"), and \_\_\_\_\_, party of the second part, (hereinafter called the "Contractor"),

**WITNESSETH:**

That the Contractor, for the consideration hereinafter fully set out, hereby agrees with the Owner as follows:

That the Contractor will furnish all products, tools, construction equipment, skill and labor of every description necessary to carry out and to complete the construction of **ANNUAL SANITARY SEWER REHABILITATION SERVICES** and will complete Work in strict conformity with the Drawings and the Specifications, together with the foregoing Bid made by the Contractor, the Invitation to Bid, Instructions to Bidders, General and Supplementary Conditions, Special Conditions, Performance and Payment Bonds and all Addenda hereto incorporated (if applicable) which form essential parts of this Contract Agreement, as if fully contained herein.

That the Contractor shall commence the Work to be performed under this Contract Agreement on a date to be specified in a written Notice to Proceed and shall fully complete all work hereunder within 150 days, in accordance with Contractor's attached schedule.

Time is of the essence and is an essential element of this Contract, and the Contractor shall pay to the Owner, not as a penalty, but as liquidated damages, the sum of \$500.00 for each calendar day that there is default of completing the Work within the time limit named herein. If the Contractor abandons the Contract before commencement of the Work or defaults in completion of all the Work after commencement thereof, the Contractor shall be liable for such liquidated damages. These fixed liquidated damages are not established as a penalty but are calculated and agreed upon in advance by the Owner and the Contractor due to the uncertainty and impossibility of making a determination as to the actual and consequential damages incurred by the Owner and the general public of Rockdale County, Georgia as a result of the failure on the part of the

Contractor to complete the Work on time. Such liquidated damages referred to herein are intended to be and are cumulative and shall be in addition to every other remedy now or hereafter enforceable at law, in equity, by statute, or under the Contract.

The Owner hereby agrees to pay to the Contractor for the faithful performance of this Contract Agreement, subject to additions and deductions as provided in the Specifications and Bid, in lawful money of the United States a sum of \$ \_\_\_\_\_ which sum shall also pay for loss or damage arising out of the nature of the Work aforesaid, or from the action of the elements, or from unforeseen obstructions or difficulties encountered in the prosecution of the Work, and for all expenses incurred by, or in consequence of the Work, its suspension or discontinuance and for well and faithfully completing the Work and the whole thereof, as herein provided, and for replacing defective work or products for a period of one year after completion.

The Owner shall make monthly partial payments to the Contractor in accordance with the provisions of the Contract Documents.

Final payment on account of this Contract Agreement shall be made within 30 days after the completion by the Contractor of all work covered by this Contract Agreement and Final Acceptance of such Work by the Owner, in accordance with the provisions of the Contract Documents.

It is further mutually agreed between the parties hereto that if, at any time after the execution of this Contract Agreement and the surety bonds hereto attached for its faithful performance, the Owner shall deem the surety or sureties upon such bond to be unsatisfactory, or if, for any reason, such bond ceases to be adequate to cover the performance of the Work, the Contractor shall, at no additional expense to Owner, within five days after the receipt of notice from the Owner to do so, furnish an additional bond or bonds in such form and amount, and with such surety or sureties as shall be satisfactory to the Owner. In such event, no further payment to the Contractor shall be deemed to be due under this Contract Agreement until such new or additional security for the faithful performance of the Work shall be furnished in manner and form satisfactory to the Owner.

IN WITNESS WHEREOF, the parties hereto have executed this Contract Agreement under their respective seals on the day and date first above written in two counterparts each of which shall, without proof or accounting for the other

counterparts, be deemed an original Contract.

**APPROVED AS TO FORM BEFORE EXECUTION**

By: \_\_\_\_\_  
Attorney for the Owner

**OWNER: ROCKDALE COUNTY, GEORGIA**

By: \_\_\_\_\_

Name: \_\_\_\_\_  
(Please Print)

Title: \_\_\_\_\_

**WITNESS:**

Name: \_\_\_\_\_  
(Please Print)

(SEAL)

Title: \_\_\_\_\_

**SUPPLIER:**

By:

Name: \_\_\_\_\_  
(Please Print)

Title: \_\_\_\_\_

**ATTEST:**

Name: \_\_\_\_\_

(Please Print)

(SEAL)

Title: \_\_\_\_\_

Note: If the Supplier is a corporation, the Contract Agreement shall be signed by the president or vice president, attested by the secretary and the corporate seal affixed. If the Supplier is a partnership, the Contract Agreement shall be signed in the partnership name by one of the partners, with indication that he or she is a general partner.

END OF SECTION

**SECTION 00610**  
**Performance Bond**

STATE OF GEORGIA BOND NO. \_\_\_\_\_

COUNTY OF ROCKDALE

KNOW ALL MEN BY THESE PRESENTS, that we, \_\_\_\_\_,  
as Principal, (hereinafter known as Contractor), and we, \_\_\_\_\_, as Surety,  
do hereby acknowledge ourselves indebted and firmly bound and held unto Rockdale County,  
Georgia for use and benefit of those entitled thereto, in the sum of  
\_\_\_\_\_ Dollars (\$ \_\_\_\_\_) for the payment of which will and truly to be made,  
in lawful money of the United States of America, we do hereby bind ourselves, successors,  
assigns, heirs and personal representatives.

BUT THE CONDITION OF THE FOREGOING OBLIGATION OR BOND IS THIS:

WHEREAS, the Owner has engaged the said Contractor for the sum of  
\_\_\_\_\_ Dollars (\$ \_\_\_\_\_) for construction of Rockdale  
County, Georgia Annual Sanitary Sewer Rehabilitation Services as more fully appears in a  
written Contract Agreement bearing the date of \_\_\_\_\_, 2015, a copy of which  
Contract Agreement is by reference hereby made a part hereof.

NOW, THEREFORE, if said Contractor shall fully and faithfully perform all the undertakings  
and obligations under the said Contract Agreement hereinbefore referred to and shall fully  
indemnify and save harmless the said Owner from all costs and damage whatsoever which it  
may suffer by reason of any failure on the part of said Contractor to do so, and shall fully  
reimburse and repay the said Owner any and all outlay and expense which it may incur in  
making good any such default, and shall correct all defects in products and workmanship  
appearing within one year of the completion of all Work, then this obligation shall be null and  
void, otherwise, it shall remain in full force and effect.

And for value received it is hereby stipulated and agreed that no change, extension of time,  
alteration or addition to the terms of the said Contract Agreement, or in the Work to be  
performed there under, or the Specifications accompanying the same shall in any wise affect the  
obligations under this Contract Agreement or Bond, and notice is hereby waived of any such  
damage, extension of time, alteration or addition to the terms of the Contract Agreement or to  
the Work or to the Contract Documents.

This bond is given pursuant to and in accordance with the provisions of O.C.G.A. Section  
36-10-1 et. seq. and 36-82-100 et. seq. and all the provisions of the law referring to this  
character of Bond as set forth in said Sections or as may be hereinafter enacted, and these are  
hereby made a part hereof to the same extent as if set out herein in full.

IN WITNESS WHEREOF, the said Contractor has hereunder affixed its signature and seal, and said Surety has hereunto caused to be affixed its corporate signature and seal, by its duly authorized officers, on this \_\_\_\_ day of \_\_\_\_\_, 2015, executed in six counterparts.

**CONTRACTOR - PRINCIPAL: \_\_\_\_**

By: \_\_\_\_\_

Name:

(Please Print)

Title:

**ATTEST:**

Name:

(Please Print)

(SEAL)

Title:

Note: Attestation for a corporation must be by the corporate secretary; for a partnership by another partner; for an individual by a notary.

**SURETY: \_**

By:

Name:

(Please Print)

Title:

**ATTEST:**

Name:

(Please Print)

(SEAL)

Title:

Note: Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the Project is located.

END OF SECTION

**SECTION 00620  
Payment Bond**

STATE OF GEORGIA

BOND NO.

COUNTY OF ROCKDALE

KNOW ALL MEN BY THESE PRESENTS, that we, \_\_\_\_\_, as Principal, (hereinafter known as Contractor), and we, \_\_\_\_\_, as Surety, are held and firmly bound unto Rockdale County, Georgia (hereinafter called the Owner), in the penal sum of \_\_\_\_\_ Dollars (\$ \_\_\_\_\_) lawful money of the United States of America, for the payment of which sum will and truly to be made, we bind ourselves, our heirs, personal representatives, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, said Contractor has entered into a certain Contract Agreement with said Owner, dated \_\_\_\_\_, 2015, for construction of Rockdale County, Annual Sanitary Sewer Rehabilitation Services (hereinafter called the Contract), which Contract Agreement and the Contract Documents for said Work shall be deemed a part hereof as fully as if set out herein.

NOW, THEREFORE, the condition of this obligation is such, that if said Contractor and all subcontractors to whom any portion of the Work provided for in said Contract Agreement is sublet and all assignees of said Contractor and of such subcontractors shall promptly make payments to all persons supplying them with labor, products, services, or supplies for or in the prosecution of the Work provided for in such Contract Agreement, or in any amendment or extension of or addition to said Contract Agreement, and for the payment of reasonable attorney's fees, incurred by the claimant in suits on this Bond, then the above obligation shall be void; otherwise, it shall remain in full force and effect.

HOWEVER, this Bond is subject to the following conditions and limitations:

- (a) Any person, firm or corporation that has furnished labor, products, or supplies for or in the prosecution of the Work provided for in said Contract Agreement shall have a direct right of action against the Contractor and Surety on this Bond, which right of action shall be asserted in a proceeding, instituted in the county in which the Work provided for in said Contract Agreement is to be performed or in any county in which Contractor or Surety does business. Such right of action shall be asserted in proceedings instituted in the name of the claimant or claimants for its use and benefit against said Contractor and Surety or either party (but not later than one year after the final settlement of said Contract Agreement) in which action such claim or claims shall be adjudicated and judgment rendered thereon.



- (b) The Principal and Surety hereby designate and appoint the \_\_\_\_\_, as the agent of each party to receive and accept service of process or other pleading issued or filed in any proceeding instituted on this Bond and hereby consent that such service shall be the same as personal service on the Contractor and/or Surety.
- (c) In no event shall the Surety be liable for a greater sum than the penalty of this Bond, or subject to any suit, action or proceeding thereon that is instituted later than one year after the final settlement of said Contract Agreement.
- (d) This Bond is given pursuant to and in accordance with provisions of O.C.G.A. Section 13-10-1 et. seq. and 36-82-100 et. seq. hereinafter, and all the provisions of law referring to this character of Bond as set forth in said Sections or as may be hereinafter enacted, and these are hereby made a part hereof to the same extent as if set out herein in full.

IN WITNESS WHEREOF, the said Contractor has hereunder affixed its signature and seal, and said Surety has hereunto caused to be affixed its corporate signature and seal, by its duly authorized officers, on this \_\_\_\_ day of \_\_\_\_\_, 2015, executed in six counterparts.

**CONTRACTOR - PRINCIPAL: \_**

By:

Name:  
(Please Print)

Title:

**ATTEST:**

Name:  
(Please Print)  
(SEAL)  
Title:

Note: Attestation for a corporation must be by the corporate secretary; for a partnership by another partner; for an individual by a notary.

**SURETY: \_**

By:

Name:  
(Please Print)

Title:

WITNESS:

Name:

(Please Print)

(SEAL)

Title:

Note: Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the Project is located.

END OF SECTION

**SECTION 00700**  
**General Conditions**

**TABLE OF CONTENTS**

<u>Article</u>	<u>Title</u>	<u>Page</u>
	General	00700-1
1	Notice of Award	00700-1
2	Execution of Contract Documents	00700-1
3	Contract Security	00700-1
4	Insurance	00700-2
5	Indemnification	00700-2
6	Notice to Proceed	00700-3
7	Termination of Work for Default	00700-3
8	Termination for Convenience of the Owner	00700-4
9	Assignments	00700-4
10	Subcontracting	00700-5
11	Authority of the PM/CM	00700-5
12	Separate Contracts	00700-6
13	Laws and Regulations	00700-6
14	Taxes	00700-7
15	Notice and Service Thereof	00700-7
16	Patents	00700-7
17	Land and Rights-of-Way	00700-8
18	Products	00700-8
19	Supervision of Work	00700-9
20	Interruption of Facility Operations	00700-9
21	Protection of Work, Property and Persons	00700-9
22	Protection of the Environment	00700-10
23	Protection, Location and Relocation of Utilities	00700-11
24	Schedules, Reports and Records	00700-11
25	Drawings and Specifications	00700-11
26	Surveys	00700-12
27	Testing, Inspection and Rejection of Work	00700-12
28	Contract Time and Liquidated Damages	00700-13
29	Changes in the Contract	00700-14
30	Payments and Completion	00700-17

GENERAL: The provisions of these General Conditions are intended, but are not limited to, providing general conditions of agreement and provisions toward the awarding of the Contract, the obligations of the successful Bidder and requirements for execution and administration of the Contract. IN ANY EVENT, PROVISIONS IN THIS SECTION ARE SUBJECT TO AND GOVERNED BY PROVISIONS IN THE SUPPLEMENTARY CONDITIONS, AS APPLICABLE.

#### **ARTICLE 1 - NOTICE OF AWARD OF CONTRACT**

After receipt of Bids, the Owner shall notify the successful Bidder of the award of the Contract as stipulated in the Supplementary Conditions.

#### **ARTICLE 2 - EXECUTION OF CONTRACT DOCUMENTS**

Within 15 days of notification of Award of Contract, the Owner will furnish the Contractor with conformed copies of Contract Documents for execution by the Contractor and the surety.

Within 10 days after receipt, the Contractor shall return all the Documents properly executed by the Contractor and the surety. Attached to each Document shall be an original power-of-attorney for the person executing the Bonds for the surety and certificates of insurance for the required insurance coverage.

Within 30 days after receipt of the conformed Documents executed by the Contractor and the surety with the power-of-attorney and certificates of insurance, the Owner will complete the execution of the Documents. Distribution of the completed Documents will be made upon execution by the Owner.

Should the Contractor and/or the surety fail to properly execute the Documents within the specified time, the Owner will have the right to proceed on the Bid Bond accompanying the Bid.

If the Owner fails to execute the Documents within the time limit specified, the Contractor will have the right to withdraw the Bid without penalty. In such event the Owner will have no liability to the Contractor under these Documents or otherwise.

Should either party require an extension of any of the time limits stated above, this shall be done only by mutual agreement between both parties.

#### **ARTICLE 3 - CONTRACT SECURITY**

The Contractor shall furnish separate Performance and Payment Bonds each in a sum equal to the amount of the Contract Price, the Performance Bond conditioned upon the performance by the Contractor of all undertakings, covenants, terms, conditions and agreements of the Contract Documents, and the Payment Bond conditioned upon the prompt payment by the Contractor to all persons supplying labor and products in the

prosecution of the Work provided by the Contract Documents. Such Bonds shall be executed by the Contractor and a corporate bonding company licensed to transact such business in the State where the Project is located and named on the current list of "Surety Companies Acceptable on Federal Bonds" as published in the Treasury Department Circular Number 570. The expense of these Bonds shall be borne by the Contractor. If at any time a surety on any such Bond is declared bankrupt or loses its right to do business in the State where the Project is located or is removed from the list of Surety Companies accepted on Federal Bonds, the Contractor shall, within 10 days after notice from the Owner to do so, substitute an acceptable Bond (or Bonds) in such form and sum and signed by such other surety as may be satisfactory to the Owner. The premium on such Bond (or Bonds) shall be paid by the Contractor. No further progress payments shall be deemed due, nor shall be made, until the new surety furnishes an acceptable Bond to the Owner.

The person executing the Bond on behalf of the surety shall file with the Bond a general power of attorney, unlimited as to amount and type of Bond covered by such power of attorney and certified to by an official of said surety.

#### **ARTICLE 4 - INSURANCE**

The Contractor shall not commence any work under this Contract until all insurance, as stipulated in the Supplementary Conditions, has been obtained and such insurance has been approved by the Owner, nor shall the Contractor allow any subcontractor to commence any work on subcontractor's contract until all similar insurance required of the subcontractor has been so obtained and approved by the Contractor.

#### **ARTICLE 5 - INDEMNIFICATION**

The Contractor shall indemnify and hold harmless the Owner, the PM/CM, the Designer and their agents and employees from and against all claims, damages, losses and expenses including claims consultants' and attorneys' fees arising out of or resulting from the performance of the Work, provided that any such claims, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property, including the loss of use resulting thereof; and is caused in whole or in part by willful act or omission of the Contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.

In any and all claims against the Owner, the PM/CM, the Designer, or any of their agents or employees, by any employee of the Contractor, any subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any subcontractor under worker's compensation acts, disability benefit acts or other employee benefits acts.

This indemnification and hold harmless obligation shall extend to cover any and all claims not covered by the Owner's Protective Liability Insurance, the requirements of which are specified in Article 4 of the Supplementary Conditions.

#### **ARTICLE 6 - NOTICE TO PROCEED**

The Notice to Proceed will be issued, following the pre-construction conference, within 10 days of the execution of the Contract Agreement by the Owner. The time may be extended by mutual agreement between the Owner and the Contractor. If the Notice to Proceed has not been issued within the 10 day period or within the period mutually agreed upon, the Contractor may terminate the Contract Agreement without further liability on the part of either party.

#### **ARTICLE 7 - TERMINATION OF WORK FOR DEFAULT**

- (a) The Work may be terminated if:
  - (1) The Contractor is adjudged bankrupt or insolvent.
  - (2) The Contractor makes a general assignment for the benefit of creditors.
  - (3) A trustee or receiver is appointed for the Contractor or for any of Contractor's property.
  - (4) The Contractor files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or applicable laws.
  - (5) The Contractor repeatedly fails to supply sufficient skilled workmen, materials or equipment.
  - (6) The Contractor fails to make satisfactory progress toward timely completion of the Work.
  - (7) The Contractor repeatedly fails to make prompt payments to subcontractors or material suppliers for labor, materials or equipment.
  - (8) The Contractor disregards laws, ordinances, rules, regulations or orders of any public body having jurisdiction of the Work.
  - (9) The Contractor fails to comply with directives of the PM/CM.
  - (10) The Contractor otherwise violates any provision of the Contract Documents.
- (b) The Owner may, without prejudice to any other right or remedy and after

giving the Contractor and surety a minimum of 10 days from delivery of a written notice, terminate the services of the Contractor and take possession of the Project and of all products thereon owned by the Contractor, and finish the Work by whatever method the Owner may deem expedient. In such case the Contractor shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds the direct and indirect costs of completing the Project, including compensation for additional professional services, such excess shall be paid to the Contractor. If such costs exceed such unpaid balance, the Contractor and/or surety shall pay the difference to the Owner. Such costs incurred by the Owner will be determined by the PM/CM and incorporated in a Change Order.

- (c) Where the Contractor's services have been so terminated by the Owner, said termination will not affect any right of the Owner against the Contractor then existing or which may thereafter accrue. Any retention or payment of monies by the Owner due the Contractor will not release the Contractor from compliance with the Contract Documents.

#### **ARTICLE 8 - TERMINATION FOR CONVENIENCE OF THE OWNER**

If, for any reason other than those provided for under Article 7, the Owner elects to discontinue, in whole or part, the Work under this Contract, the Owner may, after 10 days from delivery of a written notice to the Contractor and the PM/CM, terminate, in whole or in part, the Contractor's performance of the Work under this Contract. The notice of termination shall specify the extent to which performance of the Work under the Contract is terminated.

In the event of such termination by the Owner, the Contractor shall be entitled to payment for the Work at the jobsite acceptably performed up to the time of the termination and reimbursement for such costs as are reasonably incurred by the Contractor due to the termination and not otherwise compensated. The Contractor shall also be entitled to profit on the amounts payable to the Contractor, but such profit shall be limited to 6 percent of such amounts. The Contractor will not be entitled to any payment, including any anticipated profit, on Work not performed and will not be entitled to any compensation for other economic loss arising out of or resulting from such compensation or damages of any nature.

#### **ARTICLE 9 - ASSIGNMENTS**

The Contractor shall not assign the whole or any part of this Contract or any monies due or to become due hereunder without written consent of the Owner. In case the Contractor assigns all or any part of any monies due or to become due under this Contract, the instrument of assignment shall contain a clause substantially to the effect that it is agreed that the right of the assignee in and to any monies due or to become due to the Contractor shall be subject to prior liens of all persons, firms, and corporations for

services rendered or materials supplied for the performance of the Work called for under this Contract.

#### **ARTICLE 10 - SUBCONTRACTING**

- (a) The Contractor shall not subcontract the complete Work, or any part thereof, and shall not award any work to any subcontractor without prior written approval of the Owner. Owner approval will not be given except upon the basis of written statements containing such information as the Owner may require. At the pre-construction conference, the Contractor shall submit all subcontractors that the Contractor plans to use on the Project. Any changes or additional subcontractors should be submitted at least 14 days prior to the needed approval.
- (b) The Contractor shall utilize the services of specialty subcontractors on those parts of the Work which, under normal contracting practices, are best performed by specialty subcontractors, as required by the Owner in the Owner's sole discretion, at no additional cost to the Owner.

If the Contractor desires to perform specialty work, the Contractor shall submit a request to the Owner, accompanied by evidence that the Contractor's own organization has successfully performed the type of work in question, is presently competent to perform the type of work, and the performance of the work by specialty subcontractors will result in materially increased costs or inordinate delays.

- (c) The Contractor shall be fully responsible to the Owner for the acts and omissions of the Contractor's subcontractors and of persons either directly or indirectly employed by the Contractor. The Contractor shall be fully responsible to the Owner for the acts and omissions of independent contractors or independent subcontractors of the Contractor and of persons indirectly employed by the Contractor as the Contractor is for the acts and omissions of persons directly employed by the Contractor.
- (d) The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the Work to bind subcontractors to the Contractor by the terms of the General Conditions and other Contract Documents insofar as applicable to the work of subcontractors and to give the Contractor the same power as regards terminating any subcontract that the Owner may exercise over the Contractor under any provision of the Contract Documents.
- (e) Nothing contained in this Contract shall create any contractual relation between any subcontractor and the Owner.

#### **ARTICLE 11 - AUTHORITY OF THE PM/CM**



The PM/CM will act as the Owner's representative during the construction period. The Owner will decide questions which may arise as to quality and acceptability of products furnished and Work performed. The Owner will interpret the intent of the Contract Documents in a fair and unbiased manner. The PM/CM will make visits to the site and determine if the Work is proceeding in accordance with the Contract Documents. The PM/CM will judge as to the accuracy of quantities submitted by the Contractor in partial payment estimates which these quantities represent. The decisions of the PM/CM will be final and conclusive.

#### **ARTICLE 12 - SEPARATE CONTRACTS**

- (a) The Owner reserves the right to let other contracts in connection with this Project. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their products and the execution of their work, and the Contractor and other contractors shall properly connect and coordinate their work with each other. If the proper execution or results of any part of the Contractor's work depends upon the work of any other contractor, the Contractor shall inspect and promptly report to the PM/CM any defects in such work that render it unsuitable for such proper execution and results.
- (b) The Owner may perform additional work related to the Project with Owner's own forces. The Contractor shall afford the Owner reasonable opportunity for the introduction and storage of products and the execution of work, and shall properly connect and coordinate Contractor's work with work performed by Owner's own forces.
- (c) If the performance of additional work by other contractors or the Owner is not noted in the Contract Documents prior to the execution of the Contract, written notice thereof will be given to the Contractor prior to starting any such additional work. If the Contractor believes that the performance of such additional work by the Owner or others involves the Contractor in additional expense or entitles the Contractor to an extension of the Contract Time, the Contractor may make a claim therefor as provided in Article 29.

#### **ARTICLE 13 - LAWS AND REGULATIONS**

The Contractor's attention is directed to the fact that all applicable federal, state, county and city laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the Project shall apply to the Contract throughout, and they will be deemed to be included in the Contract as though written out in full herein. The Contractor shall keep fully informed of all laws, ordinances and regulations of the federal, state, county, city and municipal governments or authorities in any manner affecting those engaged or employed in the Work or the materials used in the Work or in any way affecting the conduct of the Work and of all orders and decrees

of bodies or tribunals having any jurisdiction or authority over same. If any discrepancy or inconsistency should be discovered in these Contract Documents herein referred to, in relation to any such law, ordinance, regulation, order or decree, the Contractor shall herewith report the same, in writing, to the Owner. The Contractor shall at all times observe and comply with all such existing and future laws, ordinances and regulations, and shall protect and indemnify the Owner, the PM/CM, the Designer and their agents against the violation of any such law, ordinance, regulation, order or decree, whether by the Contractor or by the Contractor's employees.

#### **ARTICLE 14 - TAXES**

The Contractor shall pay all sales, consumer, use and other similar taxes required by the law of the place where the Work is performed. The Owner will be responsible for any sales or use tax due on products furnished by the Owner to the Contractor to be incorporated into the Work.

#### **ARTICLE 15 - NOTICE AND SERVICE THEREOF**

- (a) All notices, demands, requests, instructions, approvals, and claims shall be in writing.
- (b) Any notice to or demand upon the Contractor will be sufficiently given if delivered at the office of the Contractor specified in the Bid (or at such other office as the Contractor may from time to time designate to the Owner in writing), or if delivered by the United States Mail in a sealed, postage-prepaid envelope, or delivered by facsimile transmission, followed by written confirmation, in each case addressed to such office.
- (c) All papers required to be delivered to the Owner shall be delivered as stipulated in the Supplementary Conditions.
- (d) Any such notice or demand shall be deemed to have been given to the Owner or made as of the time of actual delivery to Owner.

#### **ARTICLE 16 - PATENTS**

- (a) The Contractor shall hold and save the Owner, the PM/CM, the Designer and their agents harmless from liability of any kind, including cost and expenses, reasonable attorney's fees, for, or on account of, any patented or unpatented invention, process, article, or appliance manufactured or used in the performance of the Work, including its use by the Owner.
- (b) If the Contractor uses any design, process, device or materials covered by letters, trademarks, patent or copyright, the Contractor shall provide for such use by suitable agreement between the Owner and the holder of such patented or copyrighted design, device or material. The Contract prices

shall include royalties or costs arising from the use of such design, device or materials, in any way involved in the Work. The Contractor and the Contractor's sureties shall indemnify and save harmless the Owner, the PM/CM, the Designer and their agents from claims for infringement by reason of the use of such patented or copyrighted design, process, device or materials or any trademark or copyright in connection with Work agreed to be performed under this Contract, and shall indemnify the Owner, the PM/CM, the Designer and their agents for any cost, expense, damage and reasonable attorney's fees which it may be obliged to pay by reason of such infringement, at any time during the prosecution of the Work or after completion of the Work.

#### **ARTICLE 17 - LAND AND RIGHTS-OF-WAY**

The Owner will provide, as indicated in the Contract Documents and prior to the Notice to Proceed, the lands upon which the Work is to be done, rights-of-way for access thereto, and such other lands which are designated for the use of the Contractor. The Contractor shall confine work and all associated activities to the easements and other areas designated for the Contractor's use. The Contractor shall comply with any limits on construction methods and practices which may be required by easement agreements.

If, due to some unforeseen reason, the necessary easements are not obtained, the Contractor shall receive an equitable extension of Contract Time and/or an equitable increase in the Contract Price to cover the Contractor's additional costs as a result thereof, provided the Owner is notified immediately of the claim. The Contractor's claim therefor shall be handled as provided for under Article 29.

Should additional temporary easements for ingress or egress be required by the Contractor for more suitable access to the Work, these easements shall be obtained by the Contractor, at no additional cost to the Owner.

Additional requirements shall be as stipulated in the Supplementary Conditions.

#### **ARTICLE 18 - PRODUCTS**

- (a) Products shall be so stored in accordance with the manufacturer's recommendations to insure the preservation of their quality and fitness for the Work. Stored products to be incorporated in the Work shall be located so as to facilitate prompt inspection.
- (b) Manufactured products shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturer.
- (c) Products shall be furnished in accordance with shop drawings and/or samples submitted by the Contractor and approved by the Designer.

- (d) Products to be incorporated into the Work shall not be purchased by the Contractor or the subcontractor subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller.

#### **ARTICLE 19 - SUPERVISION OF WORK**

The Contractor shall supervise and direct the Work. The Contractor shall be solely responsible for the means, methods, techniques, sequences and procedures of construction. The Contractor shall employ and maintain on the Work a qualified supervisor or superintendent who shall have been designated in writing by the Contractor as the Contractor's representative at the site. The supervisor shall be present on the site at all times as required to perform adequate supervision and coordination of the Work.

The supervisor shall have full authority to act on behalf of the Contractor and to execute the orders or directions of the PM/CM without delay. The supervisor shall have full authority to promptly supply products, tools, plant equipment and labor as may be required. The supervisor's authority shall be such that all communication given to the supervisor shall be as binding as if given to the Contractor.

The Contractor shall employ only competent and skilled personnel. The Contractor shall, upon demand from the PM/CM, immediately remove any superintendent, foreman or workman whom the PM/CM or Owner may consider incompetent or undesirable.

#### **ARTICLE 20 - INTERRUPTION OF FACILITY OPERATIONS**

The Contractor shall provide the Owner with written notice at least five days prior to any interruption in facility operations required by construction activity. The notice shall include the date and time of the scheduled interruption; the length of time the interruption will be in effect; the procedures to be followed in effecting the interruption; a complete identification of all those processes, equipment and operations to be affected; and all other information the Owner may require. The Contractor shall provide any equipment, piping, auxiliary power or other means necessary to sustain facility operations or function for interruptions which have not been identified by the Specifications, or when interruptions must exceed the time allowed by the Specifications.

Additional requirements, if any, shall be as stipulated in the Supplementary Conditions.

#### **ARTICLE 21 - PROTECTION OF WORK, PROPERTY AND PERSONS**

- (a) The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. The Contractor shall take all necessary precautions for the safety of,

and shall provide the necessary protection to prevent damage, injury or loss to all employees on the Work and other persons who may be affected thereby, all the Work and all products to be incorporated therein, whether in storage on or off the site, and other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

- (b) The Contractor shall comply with the Department of Labor Safety and Health Regulations for construction, promulgated under the Occupational Safety and Health Act of 1970 (PL 91-596) and under Section 107 of the Contract Work Hours and Safety Standards Act (PL 91-54). The Contractor shall erect and maintain, as required by the conditions and progress of the Work, all necessary safeguards for safety and protection.
- (c) The Contractor shall remedy all damage, injury or loss to any property, improvements or facilities caused, directly or indirectly, in whole or in part, by the Contractor or any of the Contractor's subcontractors or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable. The property, improvements or facilities shall be replaced or restored to a condition as good as when the Contractor entered upon the Work. In case of failure on the part of the Contractor to restore such property, or make good such damages or injury, the Owner may, after 48 hours written notice, proceed to repair, rebuild, or otherwise restore such property, improvements or facilities as may be deemed necessary. The cost thereof will be deducted from any monies due or which may become due the Contractor under this Contract.
- (d) In emergencies affecting the safety of persons or the Work or property at the site or adjacent thereto, the Contractor, without special instruction or authorization from the PM/CM or Owner, shall act to prevent threatened damage, injury or loss.
- (e) Completed Work and stored products shall be suitably protected during unseasonable weather, to allow Work to proceed in a timely fashion. Work planned, or in progress, should be performed to minimize impact of adverse weather.

## **ARTICLE 22 - PROTECTION OF THE ENVIRONMENT**

- (a) The Contractor shall be responsible for taking all measures required to minimize all types of pollution associated with the undertaking of the proposed Work, and shall abide by the requirements of all governmental agencies having jurisdiction over the Work or Contractor's Project operations.

- (b) Any area used or involved in the Project that is disturbed by the Contractor, shall be restored to original or better condition, even though such area is outside the limits of that specified for grading, grassing or landscaping.

### **ARTICLE 23 - PROTECTION, LOCATION AND RELOCATION OF UTILITIES**

The Contractor shall notify owners of adjacent utilities when prosecution of the Work may affect them. The Contractor shall protect from damage all existing improvements or utilities at, or in proximity to, the site of the Work, and shall repair or restore any damage to such facilities resulting from failure to exercise reasonable care in the performance of Work. If the Contractor fails or refuses to repair any such damage promptly, the Owner may have the Work performed and charge the cost thereof to the Contractor.

Prior to the construction or installation of any proposed facility or pipeline, the Contractor shall expose all existing utilities true to their vertical and horizontal location, within the vicinity of the Work. In order to avoid conflicts between existing and proposed facilities or utilities, the Contractor shall either relocate the existing or proposed utility on a temporary or permanent basis, or shall take whatever means necessary to protect the existing facilities or utilities during the installation of proposed utilities, as approved by the Owner. No separate payment will be made for the relocation of existing utilities or for any work associated with the protection of existing facilities or utilities.

### **ARTICLE 24 - SCHEDULES, REPORTS AND RECORDS**

The Contractor shall submit to the Owner progress schedules, payrolls, reports, estimates, records and other data as the Owner may request concerning work performed or to be performed as stipulated in the Supplementary Conditions.

### **ARTICLE 25 - DRAWINGS AND SPECIFICATIONS**

The Drawings, Specifications, Contract Documents, and all supplemental documents, are considered essential parts of the Contract, and requirements occurring in one are as binding as though occurring in all. They are intended to define, describe and provide for all Work necessary to complete the Project in an acceptable manner, ready for use, occupancy, or operation by the Owner.

The PM/CM will furnish the Contractor five copies of the Contract Documents, one copy of which the Contractor shall have available at all times on the Project site. Any additional copies will be furnished at additional cost.

In case of conflict between the Drawings and Specifications, the Specifications will govern. Figure dimensions on Drawings will govern over scale dimensions, and detailed Drawings will govern over general Drawings.

In cases where products or quantities are omitted from the Specifications, the description and quantities shown on the Drawings will govern.

Any materially differing site condition as between what is shown on the Drawings and Specifications and actually found on site shall be immediately reported to the PM/CM, in writing, prior to the commencement of Work at the site. Failure of the Contractor to notify the PM/CM, in writing, of the differing site condition prior to performance of Work at the site shall constitute a waiver of any claim for additional monies. Any Change Order necessitated by the differing site condition shall be processed as provided under Article 29.

Any ambiguities or need for clarification of the Drawings or Specifications shall be immediately reported in writing to the PM/CM. Any such ambiguity or need for clarification will be handled by the PM/CM, in writing, as authorized by Article 11. No clarification of the Drawings and Specifications hereunder by the PM/CM will entitle the Contractor to any additional monies unless a Change Order has been processed as provided by Article 29 hereof.

Any work done by the Contractor following a discovery of such differing site condition or ambiguity or need for clarification in the Contract Drawings and Specifications, prior to a written report to the PM/CM, shall not entitle the Contractor to additional monies and shall be done at the Contractor's risk.

#### **ARTICLE 26 - SURVEYS**

The Owner will furnish a land survey to establish a base line for locating the principal component parts of the Work, as shown in the Contract Documents. A bench mark will be established adjacent to the Work. From this information, unless otherwise specified in the Contract Documents, the Contractor shall develop and make all detailed surveys needed for construction, such as alignment, slope stakes, batter boards, stakes for pile locations and other working points, lines, elevations and cut sheets.

#### **ARTICLE 27 - TESTING, INSPECTION AND REJECTION OF WORK**

- (a) Testing of Materials: Unless otherwise specifically provided for in the Specifications, the inspection and testing of products to be incorporated in the Work at the site shall be made by bureaus, laboratories, or agencies approved by the Owner; the cost of such inspection and testing shall be paid by the Contractor. The Contractor shall furnish evidence, satisfactory to the Owner, that the products have passed the required tests prior to their incorporation into the Work. The Contractor shall promptly segregate and remove rejected products from the site of the Work.
- (b) Inspection: The Contractor shall furnish the Owner with every reasonable facility for ascertaining whether or not the Work performed and products

used are in accordance with the requirements and intent of the Specifications and Contract Documents. No Work shall be done or products used without suitable inspection by the Owner or the Owner's representative. Failure to reject any defective Work or product shall not in any way prevent later rejection when such defect is discovered, or obligate the Owner to final acceptance.

- (c) Authority and Duties of the Resident Inspector: The Resident Inspector will be authorized to inspect all Work done and all products furnished, including preparation, fabrication and manufacture of the products to be used, but the Resident Inspector will not be authorized to alter or waive any requirements of the Contract Documents. The Resident Inspector may reject products or suspend the Work until any question at issue can be referred to and decided by the Owner. The responsibility of the Contractor is not lessened by the presence of the Resident Inspector.
- (c) Rejection of Work and Materials: All products furnished and all Work done that is not in accordance with the Drawings or Specifications or that is defective will be rejected. All rejected products or Work shall be removed immediately. If rejected products or Work is not removed within 48 hours, the PM/CM will have the right and authority to stop the Work immediately and will have the right to arrange for the removal of said rejected products or Work at the cost and expense of the Contractor. All rejected products or Work shall be replaced with other products or Work which conforms with the Drawings and Specifications.
- (e) Contractor's Responsibilities: Inspection of the Work will not relieve the Contractor of any obligations to fulfill the Contract and defective Work shall be made good regardless of whether such Work has been previously inspected by the Owner and accepted or estimated for payment. The failure of the Owner to reject improper Work shall not be considered a waiver of any defect which may be discovered later, or for Work actually defective.

## **ARTICLE 28 - CONTRACT TIME AND LIQUIDATED DAMAGES**

The Contract Time and Liquidated Damages shall be defined in the Instructions to Bidders.

The Contractor shall proceed with the Work at a rate of progress which will insure completion within the Contract Time. It is expressly understood and agreed by and between the Contractor and the Owner, that the Contract Time for the Work described herein is a reasonable time, taking into consideration the average climatic and economic conditions, and other factors prevailing in the locality of the Work.

If the Contractor shall fail to perform the Work required within the Contract Time, or



extended Contract Time if authorized by Change Order, then the Contractor shall pay to the Owner the full amount of liquidated damages specified in the Contract Documents for each calendar day that the Contractor shall be in default after the time stipulated in the Contract Documents.

The Contractor shall not be charged with liquidated damages or any excess cost when the delay in performance of the Work is due to the following and the Contractor has promptly given written notice of such delay to the Owner and PM/CM:

- (a) To any preference, priority or allocation order duly issued by the Owner.
- (b) To unforeseeable causes beyond the control and without the fault or negligence of the Contractor, including but not restricted to, acts of God or of the public enemy, acts of the Owner, acts of another contractor in the performance of a contract with the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and abnormal and unforeseeable weather; and,
- (c) To any delays of subcontractors occasioned by any of the causes specified in paragraphs (a) and (b).

#### **ARTICLE 29 - CHANGES IN THE CONTRACT**

- (a) Changes in the Work: The Owner may at any time, as the need arises, order changes within the scope of the Work without invalidating the Contract Agreement. If such changes increase or decrease the amount due under the Contract Documents, or in the time required for performance of the Work, an equitable adjustment will be authorized by Change Order.

The Owner, also, may at any time, by issuing a field order, make changes in the details of the Work. These changes by field order will not affect Contract Time or Contract Price. The Contractor shall proceed with the performance of any changes in the Work so ordered by the Owner, unless the Contractor believes that such field order entitles Contractor to a change in Contract Price or Contract Time or both, in which event Contractor shall give the PM/CM immediate, written notice thereof and if required by the Owner, an immediate estimate of the direct cost of Work as outlined in (b) below, after the receipt of the ordered change, and the Contractor shall not execute such changes pending the receipt of an executed Change Order or further written instruction from the Owner.

Should the Contractor encounter, or the Owner discover, during the progress of the Work, subsurface or latent conditions at the site materially differing from those shown on the Drawings or indicated in the Specifications, or unknown conditions of an unusual nature differing materially from those ordinarily encountered and generally recognized as

inherent in Work of the character provided for in the Drawings and Specifications, the Owner shall immediately be notified in writing of such conditions before they are disturbed. The Owner will thereupon promptly investigate the conditions.

If the Owner finds that conditions do so materially differ, or are of an unusual nature, and upon written request of the Contractor, an equitable adjustment will be authorized by Change Order.

If the Contractor does not immediately notify the Owner in writing of the belief that a field order, additional work by other contractors or the Owner, or subsurface, latent or unusual unknown conditions entitles the Contractor to a Change Order, no consideration for time or money will be given the Contractor.

The Owner may, with the Contractor's concurrence, elect to postpone the issuance of a Change Order until such time that a single Change Order of substantial importance can be issued incorporating several changes. In such cases, the Owner will indicate this intent for each change in the Contract in a written response to the Contractor's request for a change, following agreement by the Owner and Contractor on the change's scope, price and time.

- (b) Changes in Contract Price: The Contract Price may be changed only by a Change Order. The value of any Work covered by a Change Order for increase or decrease in the Contract Price will be determined by one or more of the following methods, in the order of precedence listed below:
  - (1) By estimating the number of unit quantities of each part of the Work which is changed (either increased or decreased) and then multiplying the estimated number of such unit quantities by the price Bid (which price shall include the Contractor's overhead and profit) for a unit quantity thereof.
  - (2) The Owner will fix the total lump sum value of the change in the Work of the Contractor following the Contractor's submittal, within a reasonable time, of an estimate of the direct cost of the Work. The direct cost estimate will be added to, or deducted from, the Contract Price (which price will include the Contractor's overhead and profit as outlined below). If the Contractor does not submit a cost estimate of the Work in a reasonable time or if the Owner and Contractor do not reach agreement on the cost, the Owner may fix the total lump sum value at a reasonable amount. On any lump sum change which involves a net credit to the Owner, no allowance for overhead and profit will be figured.

- (3) By ordering the Contractor to proceed with the Work and to keep and present, in such form as the Owner may direct, a correct account of the cost of the change together with all vouchers therefor. The cost hereunder will only include an allowance for overhead and profit as outlined below.

For the Work performed in item (2) or (3) above, payment will be made for the documented actual direct cost of the following:

- (aa) Labor, including foremen, for those hours they are assigned and participating in the Work covered by the change order (actual direct payroll cost of wages). The Contractor shall furnish, if required by the Owner, certified payrolls to verify wages. All labor related costs will be included in a 30 percent markup of the cost of direct payroll wages. This refers to the Contractor's specific labor wages.
- (bb) Material delivered and used on the designated Work, including sales tax, if paid for by the Contractor and as verified by original invoices or otherwise verifiable to the Owner's acceptance.
- (cc) Rental, or ownership cost of equipment, including necessary transportation of equipment, having a purchase value in excess of \$300.00. Rental or ownership cost will be allowed for only those hours during which the equipment is required on the project site. Cost allowances will not exceed the rates defined as follows: the hourly rate, for equipment not used exclusively in the change to the scope of work, will be the monthly rate, as printed in the current Rental Blue Book for Construction Equipment published by Dataquest, divided by 176; the rate, for equipment used exclusively for those tasks identified in the change to the scope of work, will be the daily, weekly or monthly rate, used singularly or in combination, which will provide the lowest total cost. The rates will be modified by the Rate Adjustment Table factors to reflect a depreciation allowance indexed to the year a machine was originally manufactured and sold. The rates will be adjusted to account for regional differences in annual use hours, cost of labor, freight, taxes, etc. The amount by which basic rates will be increased or decreased is shown on the adjustment maps included in the "Blue Book".

The equipment use period will begin only at the time equipment is unloaded at the site of the changed work, will include each day that the equipment is required at the site of the changed

work and will terminate at the end of the day on which the use of such equipment becomes unnecessary, plus reasonable transportation time. The maximum time to be paid per day will not exceed eight hours unless the equipment is in operation for a longer time. The time which will be paid for per day, for equipment not used exclusively in the change to the scope of work, will be the hours which the equipment was actually in operation on the changed work.

In addition to the actual costs in items (aa) through (cc) above, there will be, for the Contractor actually performing the work, a fixed fee of 16 percent for bond, insurance, overhead and profit added to the cost of Items (aa), (bb) and (cc), above.

If all or a portion of the Change Order is performed by a subcontractor, payment will be made for the documented actual direct cost as outlined in (aa), (bb) and (cc), above. A fixed fee of 16 percent for bond, insurance, overhead and profit will be added to the cost of (aa), (bb) and (cc) of the subcontractor's work only.

A fixed fee of 10 percent will be added to the subcontractor's Work for the Contractor's administrative handling of portions of the Work that are performed by an approved subcontractor. No additional fixed fee will be allowed for the Contractor's or a subcontractor's administrative handling of Work performed by a subcontractor's subcontractor, unless by written permission from the Owner. All other costs not specifically listed above are considered to be included in the fixed fee.

- (4) The Contractor shall, when required by the Owner, furnish the Owner with an itemized breakdown of the quantities and prices used in computing the value of any change that might be ordered, in a printed format, and with sufficient detail as required by the Owner.
- (c) Changes in Contract Time: The Contract Time may be changed only by a Change Order. Changes in the Work described in (a) and any other claim made by the Contractor for a change in the Contract Time will be evaluated by the Owner with the assistance and input of the PM/CM and if the conditions warrant, an appropriate adjustment of the Contract Time will be made.

The Owner, when making these evaluations will take into consideration the amount and scope of Work which has been changed and will evaluate if the change in Work has affected the critical path as currently accepted on the progress schedule such that it would delay the completion of the Project. If after these evaluations have been made and in the sole opinion of the

Owner, the Contractor is due an extension of time, then it will be granted by a Change Order and the Owner will pay the associated cost due the Contractor for direct field costs, only as outlined under Changes in Contract Price (aa) and (cc), exclusive of Item (bb), based on any delays to the overall Project. Extensions of time granted as a result of weather will not result in a change in Contract Price.

### **ARTICLE 30 - PAYMENTS AND COMPLETION**

- (a) **Contract Price:** The Contract Price is either a lump sum or the sum of the unit prices stated in the Contract Agreement, for each item multiplied by the actual quantities installed of each item, and is the total amount payable by the Owner to the Contractor for the performance of the Work set forth in the Contract Documents.

It is understood that the Contractor shall provide and pay for all products, labor (including labor performed after regular working hours, on Sundays, or on legal holidays), equipment, tools, water, light, power, sewer, transportation, supervision, temporary construction of any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete, place into operation, and deliver the Work.

It is further understood that the Contractor's proposed construction schedule is based on a normal 40 hour, 5 day work week, less recognized holidays. If the Contractor desires to work in excess of this limit, the Contractor shall submit a written request to the Owner a minimum of five days prior to the desired work date. The Contractor shall be responsible for any additional expenses incurred by the Owner as a result of the extended work hours, including resident inspection overtime. The cost associated with resident inspector overtime will be deducted from the Contractor's monthly payment request.

- (b) **Breakdown of Cost:** Before the first application for payment the Contractor shall submit to the PM/CM a breakdown of cost for the various portions of the Work, including quantities if required by the PM/CM, aggregating the total Contract Price prepared in such form as specified or as the PM/CM and the Contractor may agree upon and supported by such data to substantiate its correctness as the PM/CM may reasonably require.

This schedule of values, when approved by the PM/CM, will be used only as a basis for the Contractor's application for payment; however, the payment schedule will correlate directly with the Overall Project Schedule (OPS) cost information, when applicable.

- (c) **Progress Payments:** At the end of each calendar month, the Contractor shall submit to the PM/CM an itemized application for payment supported by

such other substantiating data as the PM/CM may reasonably require covering Work completed through the 20th day of the month. Progress payments shall be submitted to the PM/CM no later than the 25th of the month. Any progress payment submitted by the Contractor after the 5th of the month will be included in the following month's payment.

Application for payment may include, at the Contractor's option, the cost of products not yet incorporated into the Work which have been delivered to the site or to other storage locations authorized and approved by the PM/CM. The Owner reserves the right to accept or reject pay requests for stored materials, and to limit payments to those stored materials which, in the PM/CM's judgment, are necessary for continuing satisfactory Project progress.

Payment for stored products will be subject to the following conditions being met or satisfied:

- (1) The products shall be received in a condition satisfactory for incorporation in the Work, including manufacturer's storage and installation instructions.
- (2) The products shall be stored in accordance with the manufacturer's recommendations and in such manner that any and all manufacturer's warranties will be maintained and that they will not be damaged due to weather, construction operations or any other cause.
- (3) An invoice from the manufacturer shall be furnished for each item on which payment is requested. The request may include reimbursement for cost of delivery, limited to common carrier rates, to the site, but will not include the Contractor handling, on or off site, or for storage expense.
- (4) The Contractor shall, on request of the PM/CM, furnish written proof from the supplier of payment (less retention equal in percentage to that being retained by the Owner) for the products no later than 30 days after receipt of payment for same from the Owner.
- (5) Shop drawings, product data and samples, showing "No Exceptions Taken", has been received from the Contractor for that specific equipment or material.

The Contractor warrants that title to all Work and products covered by an Application for Payment, whether incorporated into the Project or not, will

pass to the Owner upon the receipt of such payment by the Contractor, free and clear of all liens, claims, security interests or encumbrances (except retention equal in percentage to that being retained by the Owner which may be withheld from suppliers and subcontractors to guarantee completion and performance).

- (d) Certificate for Payment: If the Contractor has made application for payment as provided above, the PM/CM will issue a Certificate for Payment to the Owner, with a copy to the Contractor, for such amount as the PM/CM determines to be properly due, or the PM/CM will state, in writing, itemized and specific reasons for withholding a Certificate as provided herein.

After the PM/CM has issued a Certificate for Payment, the Owner will pay to the Contractor the amount covering Work completed plus stored products, less retention and less previous payments made.

No certificate for a progress payment, nor any progress payment, nor any partial or entire use of occupancy of the Project by the Owner, shall constitute an acceptance of any Work not in accordance with the Contract Documents.

- (e) Retention: The Owner will retain the following amounts from each properly certified estimate:
- (1) Until the value of the Work completed, including stored materials, is at least 50 percent of the Contract amount, 10 percent of the value of all Work satisfactorily completed, including stored materials.
  - (2) When the value of the completed Work totals at least 50 percent of the Contract amount, the Owner will discontinue retaining additional amounts provided the Work is progressing satisfactorily and there is no specific cause for retaining a larger sum. The total amount retained will be at least 5 percent of the Contract amount, adjusted for Change Orders, until the date of final payment.
  - (3) The Owner may elect to reinstate retention of 10 percent of the value of the Work completed if at any time the Contractor fails to make satisfactory progress or if there is other specific cause. Satisfactory progress is identified as conforming to the construction progress schedule as required in Article 24, as modified by the Supplementary Conditions. No form of collateral in lieu of cash will be acceptable as retainage. Amounts retained by the Contractor from payments due to suppliers and subcontractors (expressed as a percentage) shall not exceed that being retained by the Owner.

- (f) **Payments Withheld:** The PM/CM may decline to approve an Application for Payment and may withhold certificate, in whole or in part, as may be necessary to protect the Owner from loss because of:
- (1) Failure of the Contractor to make payments properly to subcontractors or for labor or products.
  - (2) Unsatisfactory prosecution of the Work by the Contractor either due to quality of the Work or if the Contractor is behind the currently approved construction schedule. When the above reasons for nonpayment are corrected, then payment will be made for amounts withheld because of such reasons, not later than the next payment. Completion and Final Acceptance shall be as stipulated in the Supplementary Conditions.

END OF SECTION



**SECTION 00800**  
**Supplementary Conditions**

**GENERAL**

The provisions in this Section of the Specifications shall govern in the event of any conflict between this Section and the General Conditions.

**ARTICLE 1 - NOTICE OF AWARD OF CONTRACT**

Article 1 - Notice of Award of Contract, of the General Conditions, is hereby modified to include the following:

Within 90 days after receipt of Bids, the Owner will notify the successful Bidder of the award of the Contract.

Should the Owner require additional time to award a Contract, the time may be extended by the mutual agreement between the Owner and the successful Bidder. If an award of Contract has not been made within 90 days from the Bid date or within the extension mutually agreed upon, the Bidder may withdraw the Bid without further liability on the part of either party.

**ARTICLE 13 - LAWS AND REGULATIONS**

Article 13 - Laws and Regulations, of the General Conditions is hereby modified to include the following:

Article 13, following first paragraph,

Where professional engineering work is required in connection with any of the components required by the Contract, all Bidders and component suppliers must insure that there is full compliance with all applicable laws of the state of Georgia and any other state governing professional engineering. The Owner and PM/CM do not warrant that the name of an entity listed as an acceptable manufacturer is or will be in compliance with said laws.

**ARTICLE 15 - NOTICE AND SERVICE THEREOF**

Article 15 - Notice and Service Thereof, of the General Conditions is hereby modified to include the following:

- (c) All papers required to be delivered to the Owner shall, unless otherwise specified in writing to the Contractor, be delivered to the Rockdale County Board of Commissioners, 943 Court Street, Conyers, Georgia 30012, Attn: Richard A. Oden, Chairman, Board of Commissioners.

Any notice to or demand upon the Owner shall be sufficiently given if delivered to the Office of said Chairman if delivered by the United States Mail in a sealed, postage-prepaid envelope, or delivered by facsimile transmission, followed by written confirmation, in each case addressed to said Chairman or to such other representative of the Owner or to such other address as the Owner may subsequently specify in writing to the Contractor for such purposes.

- (e) The Contractor shall file all "Notices of Commencement" required for this Project in accordance with O.C.G.A. §44-14-361.5 et.seq. and §36-82-104 et.seq., as applicable. The Contractor shall respond to all requests for copies of a Notice of Commencement. Should the Owner or PM/CM receive such a request, this request will be forwarded to the Contractor for further handling. The name and address of the Owner shall be as stated in paragraph (c) of this Article. The name and general description of the Project shall be as stated in the Invitation to Bid.

#### **ARTICLE 17 - LAND AND RIGHTS-OF-WAY**

Article 17 - Lands and Rights-of-Way, of the General Conditions, is hereby modified to include the following:

No additional requirements.

#### **ARTICLE 20 - INTERRUPTION OF FACILITY OPERATIONS**

Article 20 - Interruption of Facility Operations, of the General Conditions, is hereby modified to include the following:

Bypasses/interruption of untreated or partially treated wastes will not be permitted unless the Contractor has obtained prior approval from the Owner. The Owner/PM/CM shall be notified at least two weeks in advance and in writing, of the date, time and duration of such bypasses/interruption. The Contractor shall pay all fines that may be imposed on the Owner for the bypassing of wastewater without prior approval.

The Contractor shall conduct operations in a manner and sequence which will provide for the continued transportation of wastewater flows during construction of this Project. The Contractor shall take all actions required to prevent discharge of sewer flow from the system to the ground or stream. Any construction actions that impede or interrupt flow shall be carefully executed and monitored to prevent surcharging and overflow.

Any damages resulting from surcharging, overflow or back-up caused by the Contractor's operations shall be the Contractor's responsibility. Fines charged the

Owner for overflows caused by the Contractor shall be paid for by the Contractor.

#### **ARTICLE 24 - SCHEDULES, REPORTS AND RECORDS**

Article 24 - Schedules, Reports and Records, of the General Conditions, is hereby modified to include the following:

- (a) The Contractor shall submit to the Owner progress schedules, payrolls, reports, estimates, records and other data as the Owner may request concerning work performed or to be performed as stipulated in the various sections of these Specifications.
- (b) Immediately after execution of the Contract by the Owner, and before the first partial payment is made, the Contractor shall deliver to the Owner a construction progress schedule in form satisfactory to the Owner, showing the proposed dates of commencement and completion of each of the various subdivisions of work required under the Contract Documents and the anticipated amount of each monthly payment that will become due the Contractor in accordance with the Progress Schedule.
- (c) An updated schedule and an updated Schedule of Submittals shall be presented with each partial payment request. Lack of an updated schedule and/or an updated Schedule of Submittals will delay processing of the pay request until receipt of the updated schedule and/or an updated Schedule of Submittals.
- (d) If the schedule reflects a completion date prior to the completion date established by the Contract Agreement, this shall afford no basis to claim for delay should the Contractor not complete the Work prior to the projected completion date. Instead all "float" between the completion date in the Contractor's schedule and the completion date established in the Contract Agreement shall belong to and be exclusively available to the Owner. Should a change order be executed with a revised completion date, the progress schedule shall be revised to reflect the new completion date.
- (e) The Contractor shall maintain on the Project site, a complete set of up-to-date Record Documents.
- (f) Project Coordination Meetings: The General Contractor shall participate in Project Coordination Meetings to be held on the site monthly, or more often if conditions warrant, to establish the current state of completion and revise the schedule as necessary. The Project Coordination Meeting will be conducted by the PM/CM.
- (g) Contractor's Responsibilities

- (1) Implement the detailed Near Term Schedule of activities to the fullest extent possible between Project Coordination Meetings.
- (2) The Contractor shall prepare and provide one copy of the Contractor's Daily Report to the PM/CM by 10:00 a.m. of the day following the Report date. This Daily Report will contain, as a minimum, the weather conditions; number of workers by craft, including supervision and management personnel on site; active and inactive equipment on site; work accomplished by CPM activity item; problems; and visitors to the jobsite.
- (3) If a current activity or series of activities on the OPS is behind schedule and if the late status is not due to an excusable delay for which a time extension would be forthcoming, the Contractor shall attempt to reschedule the activity to be consistent with the Overall Project Schedule so as not to delay any of the Contract milestones. The Contractor agrees that:
  - a. The Contractor shall attempt to expedite the activity completion so as to have it agree with the OPS. Such measures as the Contractor may choose shall be made explicit during the Project Coordination Meeting.
  - b. If, within two weeks of identification of such behind-schedule activity, the Contractor is not successful in restoring the activity to an on schedule status, the Contractor shall:
    1. Carry out the activity with the scheduled crew on an overtime basis until the activity is complete or back on schedule.
    2. Increase the crew size or add shifts so the activity can be completed as scheduled.
    3. Commit to overtime or increased crew sizes for subsequent activities, or some combination of the above as deemed suitable by the PM/CM.

These actions shall be taken at no increase in the Contract amount.
- (4) Maintain a current copy of all construction schedules on prominent display in the Contractor's field office at the Project site.
- (5) Cooperate with the Owner or Owner's representative in all aspects of the Project Scheduling System. Failure to implement the Project Scheduling System or to provide specified schedules, diagrams and reports, or to implement actions to re-establish progress consistent with the OPS may be causes for withholding of payment.

## **ARTICLE 30 - PAYMENTS AND COMPLETION**

Article 30 - Payments and Completion, of the General Conditions, is hereby modified to include the following:

- (g) Completion: ALL WORK REQUIRED BY THE CONTRACT DOCUMENTS, CONTRACT DRAWINGS AND SPECIFICATIONS MUST BE COMPLETED BEFORE THE FINAL INSPECTION IS PERFORMED. This includes, but is not limited to, the following:
  - (1) Performing tests as described in the detailed Specifications.
  - (2) Removing temporary plugs, bulkheads, bypasses, etc., and diverting flow into the facility when approved by the PM/CM.
  - (3) Grassing and restoration of the work area.

Upon completion of all work required, the Contractor shall submit completed Record Drawings to the PM/CM and request, in writing, that the final inspection be performed. The PM/CM will arrange for final inspection of the work by the Owner and Designer. If the PM/CM finds the work of the Contractor complete and acceptable in accordance with the provisions of the Contract Documents and that the Record Drawings accurately depict the complete work, PM/CM will recommend to the Owner that the job be accepted and that final payment be made.

In the event that the final inspection reveals deficiencies in meeting the Contract requirements, the Contractor shall complete all remaining items of work, and make adjustments found to be necessary. Upon receipt of written notice from the Contractor that the work is complete and ready for re-inspection, the PM/CM will arrange a final inspection.

The Contractor will be notified, in writing, by the Owner of the final acceptance of the work. The date of final acceptance shall be the termination date for the Contractor's liability for the physical properties of the facilities and the beginning of the warranty period.

Before final payment can be made, the Contractor must certify, in writing, to the Owner that all payrolls, materials bills, and other indebtedness connected with the work have been paid. If requested by the PM/CM, the Contractor shall provide release of lien documentation from subcontractors or suppliers.

Final payment will not be made if there is disputed indebtedness or if there are liens upon the property.

If upon completion of all work there is disputed indebtedness or there are liens upon the property, semi-final payment may, be made, at the Owner's option, in accordance with the following provisions:

- (1) The Owner will retain an amount equal to the disputed indebtedness and/or liens upon the property including all related cost and interest in connections with said disputed indebtedness and liens which the Owner may be compelled to pay upon and subsequent adjudication.
- (2) The Contractor shall certify to those items of work not disputed that all payables, materials bills and other indebtedness connected with the work have been paid or otherwise satisfied.

The making of the final payment shall constitute a waiver of all claims by the Owner, other than those for faulty work covered by and appearing within the warranty period.

The acceptance of final payment shall constitute a waiver of all claims by the Contractor, except those previously made, in writing, and still unsettled.

(h) Prompt Payment Clause

- (1) Owner and Contractor agree that all partial payments and final payments shall be subject to the Georgia Prompt Pay Act, as originally enacted and amended, and as set forth in O.C.G.A. §§ 13-11-1 through 13-11-11, except as provided below to the extent authorized by law:
  - a. Interest Rate: For purposes of computing interest on late payments, the rate of interest shall be one-half percent per month or a pro-rata fraction thereof on the unpaid balance as may be due.
  - b. Payment Periods:
    1. When the Contractor has performed in accordance with the provisions of these Contract Documents, the Owner shall pay the Contractor within 45 days of receipt by the Owner or the Owner's representative of any properly completed Application for Payment, based upon work completed or service provided pursuant to the terms of these Contract Documents.
    2. When a subcontractor has performed in accordance with the provisions of its subcontract and the subcontract conditions precedent to payment have been satisfied, the Contractor shall pay to that subcontractor and each subcontractor shall pay to its subcontractor, within ten days of receipt by the Contractor or subcontractor of each periodic or final payment, the full amount received for

such subcontractors work and materials based on work completed or service provided under the subcontract, less retainage expressed as a percentage, but such retainage shall not exceed that retainage being held by the Owner, provided that the subcontractor has provided or provides such satisfactory reasonable assurances of continued performance and financial responsibility to complete its work as the Contractor in its reasonable discretion may require, including but not limited to a payment and performance bond.

- c. Interest on Late Payment: Except as otherwise provided in these Contract Documents and/or in O.C.G.A. § 13-11-5, if a periodic or final payment to the Contractor is delayed by more than the time allotted in Paragraph b. of this Prompt Payment Clause or if a periodic or final payment to a subcontractor is delayed more than ten days after receipt of periodic or final payment by the Contractor or subcontractor, the Owner, Contractor, or subcontractor, as the case may be, shall pay interest to its Contractor, or subcontractor beginning on the day following the due dates as provided in Paragraph b. of this Prompt Payment Clause at the rate of interest as provided herein. Interest shall be computed per month or a pro-rata fraction thereof on the unpaid balance. There shall be no compounded interest. No interest is due unless the person or entity being charged interest receives "Notice" as provided in Paragraph d. of this Prompt Payment Clause. Acceptance of progress payments or final payment shall release all claims for interest on said payments.
- d. Notice of Late Payment and Request for Interest: Any person or entity asserting entitlement to interest on any periodic or final payment pursuant to the provisions of this Prompt Payment Clause shall provide "notice" to the person or entity being charged interest of the charging party's claim to interest on late payment. "Notice" shall be in writing, served by U.S. Certified Mail - Return Receipt Requested at the time the properly completed Application for Payment is received by the Owner or Owner's representative, and shall set forth the following:
  - 1. A short and concise statement that interest is due pursuant to the provisions of the Georgia Prompt Pay Act and this Prompt Payment Clause;
  - 2. The principal amount of the periodic or final payment which is allegedly due to the charging party; and
  - 3. The first day and date upon which the charging party alleges that said interest will begin to accrue, pursuant to the provisions of the Georgia Prompt Pay Act and this

Prompt Payment Clause.

These "Notice" provisions are of the essence; therefore, failure to comply with any requirement as set forth in this Prompt Payment Clause precludes the right to interest on any alleged late payment to which said "Notice" would otherwise apply.

- (2) Integration with the Georgia Prompt Pay Act: Unless otherwise provided in these Contract Documents, the parties hereto agree that these provisions of this Prompt Payment Clause supersede and control all provisions of the Georgia Prompt Pay Act (O.C.G.A. §§ 13-11-1 through 13-11-11 (1994)), as originally enacted and as amended, and that any dispute arising between the parties hereto as to whether or not the provisions of this contract or the Georgia Prompt Pay Act control will be resolved in favor of these Contract Documents and its terms.

END OF SECTION



**SECTION 01010**  
**SUMMARY OF WORK**

**PART 1 GENERAL**

**1.01 SECTION AND INTENT**

- A. This contract includes a wide-ranging Annual Sanitary Sewer Rehabilitation Services focused on extending the life of the sanitary sewer system. The Contractor selected by the County will be responsible for providing sewer inspection, repair and rehabilitation services to support programmed capital projects and un-programmed, short-response emergency projects.
- B. The inherent nature of the annual contract is that specific scopes of work are not known at the time of bid. Bidders must take into consideration that any combination of bid items may be assigned as a work package (i.e. work order). Therefore, Bidders are cautioned to price work in a balanced manner, such that the cost of items to be delivered appropriately stand alone or in combination with other related items.
- C. The site conditions, specific locations, and estimated quantities of the various projects are unknown at the time of bid. Quantities shown in the bid sheets are representative of the nature and character of anticipated projects. Quantities and unit prices bid are intended to provide a basis for low-bid evaluation, and to make other evaluations necessary. No guarantee can be made as to the number, size or value, or type of scope of projects that may be assigned under this contract. Quantities shown in the bid sheets shall not be construed to represent the amount mix, or combination of work to be done under the contract.

**1.02 DESCRIPTION OF WORK**

- A. General: The sewer inspection, repair and rehabilitation contract consists of ,but is not limited to: site inspection and CCTV surveys, including pipeline cleaning,; CIPP rehabilitation; bypass pumping; CIPP later rehabilitation; excavated point repairs; service lateral repair or replacement,; pipe replacement; manhole installation or replacement; manhole rehabilitation; surface restoration; other related items included in the bid, complete with all other appurtenances and related work required to complete the projects.
- B. The Work includes:
  - 1. Furnishing of all labor, material, superintendence, plant, power, light, heat, fuel, water, tools, appliances, equipment, supplies, services and other means of construction necessary or proper for the performance and

completion of the Work.

2. Obtaining and paying for all required permits.
  3. Sole responsibility for adequacy of plant and equipment.
  4. Providing the means, methods, techniques, sequences, procedures of construction and safety procedures as the CONTRACTOR may choose, unless herein expressly provided otherwise. Use only adequate and safe procedures, methods, structures, and equipment.
  5. Prosecuting the Work in an orderly manner and keeping work areas neat. Provide positive surface drainage and prevent ponding of precipitation. When the work is halted by precipitation, clean up and grade the working areas before leaving the site.
  6. Performing and completing the Work in the manner best calculated to promote rapid construction consistent with safety of life and property, to the satisfaction of the County and in strict accordance with the Contract Documents.
  7. Maintaining the Work area and site in a clean and acceptable manner.
  8. Maintaining existing facilities in service at all times except where specifically provided for otherwise herein.
  9. Protection of finished and unfinished Work.
  10. Repair and restoration of Work damaged during construction.
  11. Furnishing as necessary proper equipment and machinery, of a sufficient capacity, to facilitate the Work and to handle all emergencies normally encountered in Work of this character.
  12. Constructing, maintaining, operating and removing upon completion of the Work all necessary access and egress facilities required to complete the Work.
- C. Implied and Normally Required Work: It is the intent of these Specifications to provide the OWNER with complete operable systems, subsystems and other items of Work. Any part or item of Work which is reasonably implied or normally required to make each installation satisfactorily and completely operable is deemed to be included in the Work and the Contract Amount. All miscellaneous appurtenances and other items of Work incidental to meeting the intent of these Specifications are included in the Work and the

Contract Amount even though these appurtenances may not be specifically called for in these Specifications.

- D. Quality of Work: Regard the apparent silence of the Contract Documents as to any detail, or the apparent omission from them of a detailed description concerning any Work to be done and materials to be furnished as meaning that only the best general practice is to prevail and that only materials and workmanship of the best quality are to be used. Interpretation of these specifications will be made upon this basis.
- E. Compliance with Laws: Comply with all local, State and Federal laws, rules, ordinances and regulations applicable to this Contract and to the work done here under. Obtain all permits, licenses or other authorization necessary for the prosecution of the Work. The costs for all such permits shall be included in the contract price and no separate payment will be made therefor.
- F. The summary of the Work described in the statement of work is an overall summary of the responsibilities of the CONTRACTOR and its relation to the OWNER. It does not supersede the specific requirements of the other Contract Documents.

### **1.03 CONTRACTS**

- A. Assignment of Work – County Determination
  - 1. The County reserves the right to make assignments at its sole discretion using criteria such as cost; schedule; type, amount, and location of work assignments; ongoing number, size, and performance of work assignments; and other consideration applicable at the time of scope definition and assignment.
- B. Assignment of Work – Process
  - 1. Prior to assigning a project, and occasionally during construction, the County may requires prices from the Contractor for related extra (or less) work. The Contractor shall respond, in writing, with the requested information within ten (10) business days (two business days for emergency projects).
  - 2. A proposed work order will be provided to the Contractor that will detail the expect time for performance for the work order, the list of the unit price items and quantities that apply to the work order, drawings showing the location of the proposed work, and other information regarding the

scope and nature of the work. The proposed work order will state the date that the final price for the proposed assignment is to be returned to the County.

3. The Contractor may suggest improvements to the work order in writing no later than five (5) business days prior to the due date of the final price. This written request may include alternative bid items (including proposed equals) that will provide an improved product or lower cost. The Contractor may also request modifications to the stipulated time for performance of the work order.
4. The total price for the work order will be calculated by applying the contractor's unit prices to the estimated quantities contained in the proposed work order.
5. The work order will be issued to the Contractor with the combination of best price and completion commitment, especially where emergencies are concerned. The value of the work order will be the final price plus a lump sum contingency amount determined by the County
6. The detailed scope shown in the work order is an estimate, and the Contractor should be aware that the final actual scope is likely to change during the construction phase. Modifications may be required to the Contact Items used and the actual quantities may differ from the original estimate. For instance, a work order may anticipate one point repair, and after CCTV is it determined that two point repairs are needed.

ENF OF SECTION

**SECTION 01012**  
**CONTRACTOR'S USE OF PREMISES**

**PART 1 GENERAL**

**1.01 DESCRIPTION**

A. Rights-of-Way

1. CONTRACTOR shall confine access, operations and storage areas to rights-of-way provided by OWNER.
2. CONTRACTOR shall make all necessary arrangements, at no additional cost to the OWNER, for temporary use of private properties, in which case CONTRACTOR and CONTRACTOR's surety shall indemnify and hold harmless the OWNER against claims or demands arising from such use of properties outside of rights-of-way.
3. Restrict total length which materials may be distributed along the route of the construction at any one time to 100 linear feet unless otherwise approved in writing by the OWNER.
4. Onsite locations available as laydown areas and temporary storage during construction are limited. Soil staging and lay down areas are confined to areas along the route of construction and areas within the limits of the existing City easements as shown on the Contract Drawings. This limits the available area mainly to the roadway.
5. Use of portions of easement that are on existing properties (i.e. within the limits of the existing property boundaries) for sewer abandonment access points must be coordinated with OWNER.

B. Properties outside of Rights-of-Way

1. Permanent altering of properties adjacent to and along rights-of-way will not be permitted.
2. Any damage to properties outside of rights-of-way shall be repaired or replaced to the satisfaction of the OWNER at no additional cost to the OWNER.

C. Use of Site

1. CONTRACTOR shall assume full responsibility for protection and

safekeeping of products stored on and off premises.

2. CONTRACTOR shall move stored products that interfere with the operations of OWNER or another CONTRACTOR.
3. CONTRACTOR shall obtain approvals of governing authorities prior to impeding or closing public roads or streets. Do not close more than two consecutive intersections at one time.
4. Notify the OWNER 48 hours prior to closing a street or a street crossing. Permits for street closures are required in advance and are the responsibility of the CONTRACTOR.
5. Notify the OWNER immediately prior to closing a street or a street crossing during emergency work
6. Maintain access for emergency vehicles including access to fire hydrants.
7. Avoid obstructing drainage ditches or inlets; when obstruction is unavoidable due to requirements of the Work, provide grading and temporary drainage structures to maintain unimpeded flow.
8. Perform daily clean up of dirt, debris, scrap materials and other disposable items inside and outside the construction zone. Keep streets, driveways, and sidewalks clean of dirt, debris and scrap materials. Do not leave buildings, roads, streets or other project areas unclean overnight. Any costs incurred by the OWNER due to the CONTRACTOR's failure to clean up the site will be deducted from the CONTRACTOR's final invoice and a penalty of \$100 per indecent shall be assessed to the CONTRACTOR.
9. CONTRACTOR shall obtain and pay for all additional storage or work areas required for CONTRACTOR'S operations.

D. Notification to Property Owners and Adjacent Occupants

1. Notify individual occupants in areas to be affected by the Work of the proposed construction and time schedule. Notification shall be not less than 48 hours or more than 2 weeks prior to work being performed within 200 feet of the homes or businesses. All public notification activities shall be coordinated through OWNER personnel. The OWNER will provide a sample door hanger showing form and content to be followed. Notification shall include the date and time Work is scheduled to begin, and the date and

time Work is scheduled to be completed. Notification shall also include contact information for the CONTRACTOR.

2. Notify individual occupants in areas to be affected by the emergency Work immediately after coordinating plan of action. Continue to update individual occupants as emergency plans change and work progresses. All public notification activities shall be coordinated through OWNER personnel.

E. Public, Temporary, and Construction Roads and Ramps

1. Construct and maintain temporary detours to provide for normal public traffic flow when use of public roads or streets is closed by necessities of the Work.
2. Provide mats or other means to prevent overloading or damage to existing roadways from tracked equipment or exceptionally large or heavy trucks or equipment.

F. Excavation in Streets and Driveways

1. Avoid hindering or needlessly inconveniencing public travel on a street or any intersecting alley or street for more than two blocks at any one time, except by permission of the OWNER.
2. Obtain the OWNER's approval when the nature of the Work requires closing of an entire street. Permits required for street closure are the CONTRACTOR's responsibility. Avoid unnecessary inconvenience to abutting property owners.
3. Remove surplus materials and debris and open each block for public use as work in that block is complete.
4. Avoid obstructing driveways or entrances to private property.
5. Provide temporary crossing or complete the excavation and backfill in one continuous operation to minimize the duration of obstruction when excavation is required across drives or entrances.

G. Maintenance and Protection of Traffic

1. Public Roadways:
  - a. The CONTRACTOR must maintain traffic control as it is described in GDOT regulations, the General Conditions, Special Provisions and as described herein. Where an apparent conflict

occurs between the regulations, the General Conditions, Special Provisions and the requirements of this Section, the regulations govern.

- b. When required to cross, obstruct or temporarily close a street or trafficway, CONTRACTOR shall provide and maintain suitable bridges, detours or other temporary means for the accommodation of traffic. CONTRACTOR shall furnish steel plates and cold mix for such work. Closings shall be for the shortest time practical, and passage shall be restored immediately after completion of backfill and temporary paving or bridging.
  - c. CONTRACTOR shall give the required advance notice of proposed operations to the fire and police departments.
  - d. CONTRACTOR shall give reasonable notice to owners or tenants of private property who may be affected by the operations. All public notification activities shall be coordinated through OWNER's personnel.
  - e. CONTRACTOR shall provide signs, signals, barricades, flares, lights and all other equipment, service and personnel required to regulate and protect all traffic, and warn of hazards. All such work shall conform to requirements of the OWNER. Coordinate activities with the OWNER. Remove temporary equipment and facilities when no longer required; restore grounds to original, or to specified conditions.
  - f. CONTRACTOR shall maintain at all times a 10-foot-wide all-weather lane adjacent to work areas which shall be kept free of construction equipment and debris and shall be for the use of emergency vehicles, or as otherwise provided in the traffic control plan.
  - g. CONTRACTOR shall not obstruct the normal flow of traffic from 7 a.m. to 9 a.m. and 4 p.m. to 6 p.m. on designated major roadways unless directed by the OWNER.
  - h. CONTRACTOR shall keep streets used for entering or leaving the job area free of excavated material, debris, and any foreign material resulting from construction operations.
2. Residential Entrances:
- a. CONTRACTOR shall maintain local driveway access to residential



and commercial properties adjacent to work areas at all times or as directed by the OWNER.

3. Traffic Signals and Signs:

- a. Provide and operate traffic control and directional signals required to direct and maintain an orderly flow of traffic in all areas under CONTRACTOR's control, or affected by CONTRACTOR's operations. All such work shall conform to the requirements in the Georgia Department of Transportation (GDOT) Standards.
- b. Provide traffic control and directional signs, mounted on barricades or standard posts:
  - (1) At each change of direction of a roadway and at each crossroad.
  - (2) At detours and hazardous areas.
  - (3) At parking areas.

4. Flagpersons:

- a. Provide certified and suitably equipped flagpersons when construction operations encroach on traffic lanes, as required for regulation of traffic and in accordance with the requirements of the OWNER.
- b. Where a railroad flagperson is required, it is the CONTRACTOR's responsibility to coordinate with the applicable railroad and to pay for the flagperson at no additional cost to the OWNER.

5. Flares and Lights:

- a. Provide flares and lights during periods of low visibility:
  - (1) To clearly delineate traffic lanes, to guide traffic and to warn of hazardous areas.
  - (2) For use by flagpersons in directing traffic.
  - (3) Provide illumination of critical traffic and parking areas.

6. Parking Control:

- a. Control all CONTRACTOR related vehicular parking within the limits of the Work to preclude interference with public traffic or parking, access by emergency vehicles, OWNER's operations, or construction operations. CONTRACTOR related vehicular parking

not to be within median strips unless approved by the OWNER. CONTRACTOR related vehicular parking within median strips shall be allowed when the Work is within the median strip. Provide temporary parking facilities for the public as may be required because of construction or operations.

- b. Monitor parking of all construction and private vehicles:
  - (1) Maintain free vehicular access to and through parking areas.
  - (2) Prohibit parking on or adjacent to access roads, or in non-designated areas.

7. Site Control

- a. CONTRACTOR personnel to remain at all times at open project site. This includes, but is not limited to all break times.

H. Site Restoration

- 1. Provide site restoration as specified herein.

I. County Water

- 1. The CONTRACTOR shall obtain water required for construction by connection to County fire hydrants, provided the connection is made in accordance with County requirements. Provide notice to County Agencies prior to withdrawing water from the hydrants. Support meter and backflow preventer so as to not damage hydrants. Be responsible for any damage resulting from improper operation of hydrants. Do not use or obstruct a fire hydrant when there is a fire in the area. Remove water meters, fittings, and piping from fire hydrants at the end of each working day.

**PART 2 PRODUCTS**

Not Used

**PART 3 EXECUTION**

Not Used

END OF SECTION

**SECTION 01025**  
**Measurement and Payment**

**PART 1 GENERAL**

**1.01 SCOPE**

- A. The Bid lists each item of the Project for which payment will be made. No payment will be made for any items other than those listed in the Bid.
- B. Required items of work and incidentals necessary for the satisfactory completion of the work which are not specifically listed in the Bid shall be considered as incidental to the work. All costs thereof, including Contractor's overhead costs and profit, shall be considered as included in the lump sum or unit prices bid for the various Bid items. The Contractor shall prepare the Bid accordingly.
- C. Work includes furnishing all plant, labor, equipment, tools and materials, which are not furnished by the Owner and performing all operations required to complete the work satisfactorily, in place, as specified herein.

**1.02 DESCRIPTIONS**

- A. Measurement of an item of work will be by the unit indicated in the Bid.
- B. Final payment quantities shall be determined from the record drawings. The record drawing lengths, dimensions, quantities, etc. shall be determined by a survey/record drawing after the completion of all required work. Said survey/record drawing shall conform to Section 01720 of these Specifications. The precision of final payment quantities shall match the precision shown for that item in the Bid.
- C. Payment will include all necessary and incidental related work not specified to be included in any other item of work listed in the Bid.
- D. Unless otherwise stated in individual sections of the Specifications or in the Bid, no separate payment will be made for any item of work, materials, parts, equipment, supplies or related items required to perform and complete the work. The costs for all such items required shall be included in the price bid for item of which it is a part.
- E. Payment will be made by extending unit prices multiplied by quantities provided and then summing the extended prices to reflect actual work. Such price and payment shall constitute full compensation to the Contractor for furnishing all plant, labor, equipment, tools and materials not furnished by the Owner and for performing all operations required to provide to the Owner the entire Project, complete in place, as specified herein.
- F. Contractor shall refer to individual technical sections for specific measurement and

payment requirements for contract items.

- G. "Products" shall mean materials or equipment permanently incorporated into the work.

#### **1.04 UNIT PRICE PAY ITEMS**

- A. The estimated number of bid units for Contract Items, as listed in the Price Schedule on the Bid Form, are approximate only and are included solely for the purpose of comparison of Bids. The Owner does not expressly or by implication agree that the estimated number of units will correspond with the number of units actually needed and reserves the right to increase or decrease any quantity or to eliminate any quantity as the Owner may deem necessary. The Contractor or the Owner will not be entitled to any adjustment in a unit bid price as a result of any change in an estimated quantity and agrees to accept the aforesaid unit bid prices as complete and total compensation for any additions caused by changes or alterations in the Work ordered by the Owner.

#### **1.05 NONCONFORMANCE ASSESSMENT**

- A. Remove and replace the Work, or portions of the Work, not conforming to the Contract Documents.

#### **1.06 NONPAYMENT FOR REJECTED PRODUCTS**

- A. Payment will not be made for any of the following:
  1. Products wasted or disposed of in a manner that is not acceptable to the Owner.
  2. Products determined as nonconforming before or after the work are completed.
  3. Products not completely unloaded from transporting vehicle.
  4. Products placed beyond the lines and levels of the required Work.
  5. Products remaining on hand after completion of the Work, unless specified otherwise.

END OF SECTION

## **SECTION 01060**

### **Regulatory Requirements**

#### **PART 1 GENERAL**

##### **1.01 SCOPE**

- A. Permits and Responsibilities: The Contractor shall, without additional expense to the Owner, be responsible for obtaining all necessary licenses and permits, including building permits, and for complying with any applicable federal, state, county and municipal laws, codes and regulations, in connection with the prosecution of the Work.
- B. The Contractor shall take proper safety and health precautions to protect the Work, the workers, the public and the property of others.
- C. The Contractor shall also be responsible for all materials delivered and work performed until completion and acceptance of the Work, except for any completed unit of construction thereof which may heretofore have been accepted.

##### **1.02 NPDES PERMITS FOR STORM WATER DISCHARGES**

- A. The Federal Water Pollution Control Act (also known as the Clean Water Act (CWA)), as amended in 1987, requires National Pollutant Discharge Elimination System (NPDES) permits for storm water discharges associated with industrial activity.
- B. On November 16, 1990, (55 FR 47990), the Environmental Protection Agency (EPA) issued regulations establishing permit application requirements for storm water discharges associated with industrial activity. These regulations are primarily contained in Section 122.26 of Section 40 of the Code of Federal Regulations (40 CFR Part 122.26).
- C. The November 16, 1990 regulation established the following definition of "storm water discharge associated with industrial activity" at 40 CFR 122.26(b)(14):

"Storm water discharge associated with industrial activity" means the discharge from any conveyance which is used for collecting and conveying storm water and which is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. For the categories of industries identified in subparagraphs (i) through (x) of this subsection, the term includes, but is not limited to, storm water discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse

sites; sites used for the application or disposal of process waste waters (as defined at 40 CFR 401); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and finished products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water. The following categories of facilities are considered to be engaging in "industrial activity" for purposes of this subsection:

(i) - (ix) and (xi) omitted for brevity.

(x) Construction activity including clearing, grading and excavation activities except: operations that result in the disturbance of less than five acres of total land area which are not part of a larger common plan of development or sale;

- D. These regulations are effective for all activities covered by the regulation on or after October 1, 1992.
- E. As a minimum, the Contractor shall complete EPA Form 3510-2F. A manual entitled "Guidance Manual for the Preparation of NPDES Permit Applications for Storm Water Discharges Associated With Industrial Activity" as published by the United States Environmental Protection Agency, is available to assist the Contractor in the application process.

END OF SECTION

## **SECTION 01091** **Codes and Standards**

### **PART 1 GENERAL**

#### **1.01 DESCRIPTION**

- A. Whenever reference is made to conforming to the standards of any technical society, organization, body, code or standard, it shall be construed to mean the latest standard, code, specification or tentative specification adopted and published at the time of advertisement for Bids. This shall include the furnishing of materials, testing of materials, fabrication and installation practices. In those cases where the Contractor's quality standards establish more stringent quality requirements, the more stringent requirement shall prevail. Such standards are made a part hereof to the extent which is indicated or intended.
- B. The inclusion of an organization under one category does not preclude that organizations' standards from applying to another category.
- C. In addition, all work shall comply with the applicable requirements of local codes, utilities and other authorities having jurisdiction.
- D. All material and equipment, for which a UL Standard, an AGA or NSF approval or an ASME requirement is established, shall be so approved and labeled or stamped. The label or stamp shall be conspicuous and not covered, painted, or otherwise obscured from visual inspection.
- E. The standards which apply to this Project are not necessarily restricted to those organizations which are listed in Article 1.02.

#### **1.02 STANDARD ORGANIZATIONS**

##### **A. Piping and Valves**

ACPA	American Concrete Pipe Association
ANSI	American National Standards Institute
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
AWWA	American Water Works Association
CISPI	Cast Iron Soil Pipe Institute
DIPRA	Ductile Iron Pipe Research Association
FCI	Fluid Controls Institute
MSS	Manufacturers Standardization Society

NCPI National Clay Pipe Institute  
NSF National Sanitation Foundation  
PPI Plastic Pipe Institute  
UPPA Uni-Bell PVC Pipe Association

B. Materials

AASHTO American Association of State Highway and Transportation Officials  
ANSI American National Standards Institute  
ASTM American Society for Testing and Materials

C. Painting and Surface Preparation

NACE National Association of Corrosion Engineers  
SSPC Steel Structures Painting Council

D. Electrical and Instrumentation

AEIC Association of Edison Illuminating Companies  
AIEE American Institute of Electrical Engineers  
EIA Electronic Industries Association  
ICEA Insulated Cable Engineers Association  
IEEE Institute of Electrical and Electronic Engineers  
IES Illuminating Engineering Society  
IPC Institute of Printed Circuits  
IPCEA Insulated Power Cable Engineers Association  
ISA Instrument Society of America  
NEC National Electric Code  
NEMA National Electrical Manufacturers Association  
NFPA National Fire Protection Association  
TIA Telecommunications Industries Association  
UL Underwriter's Laboratories  
VRCI Variable Resistive Components Institute

E. Aluminum

AA Aluminum Association  
AAMA American Architectural Manufacturers Association

F. Steel and Concrete

ACI American Concrete Institute  
AISC American Institute of Steel Construction, Inc.  
AISI American Iron and Steel Institute



CRSI Concrete Reinforcing Steel Institute  
NRMA National Ready-Mix Association  
PCA Portland Cement Association  
PCI Prestressed Concrete Institute

G. Welding

ASME American Society of Mechanical Engineers  
AWS American Welding Society

H. Government and Technical Organizations

AIA American Institute of Architects  
APHA American Public Health Association  
APWA American Public Works Association  
ASA American Standards Association  
ASAE American Society of Agricultural Engineers  
ASCE American Society of Civil Engineers  
ASQC American Society of Quality Control  
ASSE American Society of Sanitary Engineers  
CFR Code of Federal Regulations  
CSI Construction Specifications Institute  
EDA Economic Development Administration  
EPA Environmental Protection Agency  
FCC Federal Communications Commission  
FmHA Farmers Home Administration  
FS Federal Specifications  
IAI International Association of Identification  
ISEA Industrial Safety Equipment Association  
ISO International Organization for Standardization  
ITE Institute of Traffic Engineers  
NBFU National Board of Fire Underwriters  
(NFPA) National Fluid Power Association  
NBS National Bureau of Standards  
NISO National Information Standards Organization  
OSHA Occupational Safety and Health Administration

H. Government and Technical Organizations Contd.

SI Salt Institute  
SPI The Society of the Plastics Industry, Inc.  
USDC United States Department of Commerce  
WEF Water Environment Federation

I. General Building Construction

AHA	American Hardboard Association
AHAM	Association of Home Appliance Manufacturers
AITC	American Institute of Timber Construction
APA	American Parquet Association, Inc.
APA	American Plywood Association
BHMA	Builders Hardware Manufacturers Association
BIFMA	Business and Institutional Furniture Manufacturers Association
DHI	Door and Hardware Institute
FM	Factory Mutual Fire Insurance Company
HPMA	Hardwood Plywood Manufacturers Association
HTI	Hand Tools Institute
IME	Institute of Makers of Explosives
ISANTA	International Staple, Nail and Tool Association
ISDSI	Insulated Steel Door Systems Institute
IWS	Insect Screening Weavers Association
MBMA	Metal Building Manufacturers Association
NAAMM	National Association of Architectural Metal Manufacturers
NAGDM	National Association of Garage Door Manufacturers
NCCLS	National Committee for Clinical Laboratory Standards
NFPA	National Fire Protection Association
NFSA	National Fertilizer Solutions Association
NKCA	National Kitchen Cabinet Association
NWMA	National Woodwork Manufacturers Association
NWWDA	National Wood Window and Door Association
RMA	Rubber Manufacturers Association
SBC	SBCC Standard Building Code
SDI	Steel Door Institute
SIA	Scaffold Industry Association
SMA	Screen Manufacturers Association
SPRI	Single-Ply Roofing Institute
TCA	Tile Council of America
UBC	Uniform Building Code

J. Roadways

AREA	American Railway Engineering Association
DOT	Department of Transportation
SSRBC	Standard Specifications for Construction of Transportation Systems, Georgia Department of Transportation

K. Plumbing

AGA American Gas Association  
NSF National Sanitation Foundation  
PDI Plumbing Drainage Institute  
SPC SBCC Standard Plumbing Code

L. Refrigeration, Heating, and Air Conditioning

AMCA Air Movement and Control Association  
ARI American Refrigeration Institute  
ASHRAE American Society of Heating, Refrigeration, and Air Conditioning Engineers  
ASME American Society of Mechanical Engineers  
CGA Compressed Gas Association  
CTI Cooling Tower Institute  
HEI Heat Exchange Institute  
IIAR International Institute of Ammonia Refrigeration  
NB National Board of Boilers and Pressure Vessel Inspectors  
PFMA Power Fan Manufacturers Association  
SAE Society of Automotive Engineers  
SMACNA Sheet Metal and Air Conditioning Contractors National Association  
SMC Standard Mechanical Code  
TEMA Tubular Exchangers Manufacturers Association

M. Equipment

AFBMA Anti-Friction Bearing Manufacturers Association, Inc.  
AGMA American Gear Manufacturers Association  
ALI Automotive Lift Institute  
CEMA Conveyor Equipment Manufacturers Association  
CMAA Crane Manufacturers Association of America  
DEMA Diesel Engine Manufacturers Association  
MMA Monorail Manufacturers Association  
OPEI Outdoor Power Equipment Institute, Inc.  
PTI Power Tool Institute, Inc.  
RIA Robotic Industries Association  
SAMA Scientific Apparatus Makers Association

END OF SECTION

**SECTION 01200  
PROJECT MEETINGS**

**PART 1 GENERAL**

**1.01 SCOPE**

- A. Work under this Section includes all scheduling and administering of pre-construction and progress meetings as herein specified and necessary for the proper and complete performance of this Work.
- B. Scheduling and Administration by PM/CM:
  - 1. Prepare agenda.
  - 2. Make physical arrangements for the meetings.
  - 3. Preside at meetings.
  - 4. Record minutes and include significant proceedings and decisions.
  - 5. Distribute copies of the minutes to participants.

**1.02 PRECONSTRUCTION CONFERENCE**

- A. The PM/CM shall schedule the preconstruction conference prior to the issuance of the Notice to Proceed.
- B. Representatives of the following parties are to be in attendance at the meeting:
  - 1. Owner.
  - 2. PM/CM.
  - 3. Design Engineer.
  - 4. Contractor and superintendent.
  - 5. Major subcontractors.
  - 6. Representatives of governmental or regulatory agencies when appropriate.

C. The agenda for the preconstruction conference shall consist of the following as a minimum:

1. Distribute and discuss a list of major subcontractors and a tentative construction schedule.
2. Critical work sequencing.
3. Designation of responsible personnel and emergency telephone numbers.
4. Processing of field decisions and change orders.
5. Adequacy of distribution of Contract Documents.
6. Schedule and submittal of shop drawings, product data and samples.
7. Pay request format, submittal cutoff date, paydate and retainage.
8. Procedures for maintaining record documents.
9. Use of premises, including office and storage areas and Owner's requirements.
10. Major equipment deliveries and priorities.
11. Notifications to Owner.
12. Safety and first aid procedures.
13. Security procedures.
14. Housekeeping procedures.
15. Workhours.
16. Notifications to residents impacted by the work

**1.03 PROJECT COORDINATION MEETINGS**

- A. Schedule regular meetings monthly or more often as directed by the PM/CM.
- B. Hold called meetings as the progress of the Work dictates.

- C. The meetings shall be held at the location indicated by the PM/CM.
- D. Representatives of the following parties are to be in attendance at the meetings:
1. PM/CM.
  2. Contractor and superintendent.
  3. Major subcontractors as pertinent to the agenda.
  4. Owner's representative as appropriate.
  5. Engineers representation as required by PM/CM.
  6. Representatives of governmental or other regulatory agencies as appropriate.
- E. The minimum agenda for progress meetings shall consist of the following:
1. Review and approve minutes of previous meetings.
  2. Review work progress since last meeting.
  3. Note field observations, problems and decisions.
  4. Identify problems which impede planned progress.
  5. Review off-site fabrication problems.
  6. Review Contractor's corrective measures and procedures to regain plan schedule.
  7. Review Contractor's revision to the construction schedule as outlined in the Supplementary Conditions.
  8. Review submittal schedule; expedite as required to maintain schedule.
  9. Maintenance of quality and work standards.
  10. Review changes proposed by Owner for their effect on the construction schedule and completion date.
  11. Complete other current business.

END OF SECTION

## **SECTION 01310**

### **Construction Schedules**

#### **PART 1 GENERAL**

##### **1.01 SCOPE**

- A. The work under this Section includes preparing, furnishing, distributing, and periodic updating of the construction program/schedules as specified herein.
- B. The purpose of the schedule is to demonstrate that the Contractor can complete the overall Project within the Contract Time, and meet all required interim milestones.

##### **1.02 QUALITY ASSURANCE**

The Project Schedule shall be developed using Microsoft Project 2000 by Microsoft Corporation for scheduling or other approved method/program. Coordinate with the PM/CM to insure compatibility of software and computer systems.

##### **1.03 SUBMITTALS**

- A. Project Schedule
  - 1. Submit the Project Schedule within 5 days after date of the Notice to Proceed.
  - 2. The PM/CM will review schedule and will return the reviewed copy within 5 days after receipt.
  - 3. If required, resubmit within five days after receipt of a returned review copy.
- B. Updating: Submit an update of the schedule with each request for payment.
- C. Submit the number of copies required by the Contractor, plus four copies to be retained by the PM/CM.

##### **1.04 APPROVAL**

Approval of the Contractor's construction program and revisions thereto, shall in no way relieve the Contractor of any duties and obligations under the Contract. Such approval is limited to the format of the schedule and does not in any way indicate approval of, or concurrence with, the Contractor's means, methods and ability to carry out the Work.

**1.05 PRELIMINARY PROJECT SCHEDULE (PPS)**

- A. The Project Schedule shall be a bar chart or time scaled network diagram showing the Contractor's proposed operations.

**1.06 UPDATING**

- A. Written Narrative Report: Provide a written narrative report with each update including:
  - 1. A status review of the Project.
  - 2. A discussion of problem areas including current and anticipated delay factors and their impact.
  - 3. Direct action taken, or proposed, and its effect.
  - 4. A description of revisions including:
    - a. Their effect on the schedule due to the change of scope.
    - b. Revisions in duration of activities.
    - c. Other changes that may affect the schedule.
  - 5. A listing of behind-schedule materials and equipment procurement activities.
  - 6. A listing of any significant changes in the activities and restraints occurring since the last update and why the changes were made.
- B. Critical Work List: Provide a listing of critical work to be performed prior to the next Project Coordination Meeting, specifically listing what must be done during the next 30 days to stay on the critical path schedule.
- C. At each Project Coordination Meeting, the Contractor shall present for discussion the most current update of the schedule.

END OF SECTION



**SECTION 01320**  
**Construction Photographs**

**PART 1 GENERAL**

**1.01 SCOPE**

- A. The Contractor shall furnish all equipment and labor materials required to provide the Owner with construction photographs of the Project.
- B. Negatives shall become the property of the Owner and none of the photographs herein shall be published without express permission of the Owner.

**1.02 PRE AND POST CONSTRUCTION PHOTOGRAPHS**

- A. Prior to the beginning of any work, the Contractor shall take project photographs of the work area to record existing conditions.
- B. Following completion of the work, another recording shall be made showing the same areas and features as in the pre-construction photographs.
- C. All conditions which might later be subject to disagreement shall be shown in sufficient detail to provide a basis for decisions.
- D. The Contractor shall coordinate the taking of pre and post-construction photographs with the PM/CM. The PM/CM shall observe the taking of the photographs.
- E. The pre-construction photographs shall be submitted to the PM/CM within 20 calendar days after the date of receipt by the Contractor of Notice to Proceed. Post-construction photographs shall be provided prior to final acceptance of the project.

**1.03 PROGRESS PHOTOGRAPHS**

- A. Photographs shall be taken to record the general progress of the Project during each pay period. Photographs shall be representative of the primary work being performed at that time.
- B. The photographs shall include the date and time marking of the recording. All photographs shall be labeled on a tab connected to the bottom of the photo to indicate date and description of work shown.
- C. A minimum of 10 photographs shall be submitted with each request for payment. The view selection will be as agreed to with the PM/CM. Two prints of each photograph

shall be submitted to the PM/CM.

**1.04 SUBMITTALS**

- A. A CD disc is an acceptable method for submitting the photographs.
- B. Construction photographs shall be submitted with each payment request. Failure to include photographs may be cause for rejection of the payment request.

END OF SECTION

**SECTION 01340**  
**Shop Drawings, Product Data and Samples**

**PART 1 GENERAL**

**1.01 SCOPE**

- A. The work under this Section includes submittal to the PM/CM of shop drawings, product data and samples required by the various sections of these Specifications.
- B. Submittal Contents: The submittal contents required are specified in each section.
- C. Definitions: Submittals are categorized as follows:
  - 1. Shop Drawings
    - a. Shop drawings shall include technical data, drawings, diagrams, procedure and methodology, performance curves, schedules, templates, patterns, test reports, calculations, instructions, measurements and similar information as applicable to the specific item for which the shop drawing is prepared.
    - b. Provide newly-prepared information, on reproducible sheets, with graphic information at accurate scale (except as otherwise indicated) or appropriate number of prints hereof, with name or preparer (firm name) indicated. The Contract Drawings shall not be traced or reproduced by any method for use as or in lieu of detail shop drawings. Show dimensions and note which are based on field measurement. Identify materials and products in the work shown. Indicate compliance with standards and special coordination requirements. Do not allow shop drawing copies without appropriate final "Action" markings by the Designer to be used in connection with the Work.
    - c. Drawings shall be presented in a clear and thorough manner. Details shall be identified by reference to sheet and detail, specification section, schedule or room numbers shown on the Contract Drawings.
    - d. Minimum assembly drawings sheet size shall be 24 x 36-inches.
    - e. Minimum detail sheet size shall be 8-1/2 x 11-inches.
    - f. Minimum Scale:
      - (1) Assembly Drawings Sheet, Scale: 1-inch = 30 feet.
      - (2) Detail Sheet, Scale: 1/4-inch = 1 foot.

2. Product Data

- a. Product data includes standard printed information on materials, products and systems, not specially prepared for this Project, other than the designation of selections from among available choices printed therein.
- b. Collect required data into one submittal for each unit of work or system, and mark each copy to show which choices and options are applicable to the Project. Include manufacturer's standard printed recommendations for application and use, compliance with standards, application of labels and seals, notation of field measurements which have been checked and special coordination requirements.

3. Samples

- a. Samples include both fabricated and un-fabricated physical examples of materials, products and units of work, both as complete units and as smaller portions of units of work, either for limited visual inspection or, where indicated, for more detailed testing and analysis.
- b. Provide units identical with final condition of proposed materials or products for the work. Include "range" samples, not less than three units, where unavoidable variations must be expected, and describe or identify variations between units of each set. Provide full set of optional samples where the Designer's selection is required. Prepare samples to match the Designer's sample where indicated. Include information with each sample to show generic description, source or product name and manufacturer, limitations and compliance with standards. Samples are submitted for review and confirmation of color, pattern, texture and "kind" by the Designer. The Designer will note "test" samples, except as otherwise indicated, for other requirements, which are the exclusive responsibility of the Contractor.

4. Miscellaneous submittals related directly to the Work (non-administrative) include warranties, maintenance agreements, workmanship bonds, project photographs, survey data and reports, physical work records, statements of applicability, quality testing and certifying reports, copies of industry standards, record drawings, field measurement data, operating and maintenance materials, overrun stock, security/protection/safety keys and similar information, devices and materials applicable to the Work but not processed as shop drawings, product data or samples.

**1.02 SPECIFIC CATEGORY REQUIREMENTS**

A. General: Except as otherwise indicated in the individual work sections, comply with general requirements specified herein for each indicated category of submittal. Submittals shall contain:

1. The date of submittal and the dates of any previous submittals.
2. The Project title.
3. Numerical submittal numbers, starting with 1.0, 2.0, etc. Revisions to be numbered 1.1, 1.2, etc.
4. The Names of:
  - a. Contractor
  - b. Supplier
  - c. Manufacturer
5. Identification of the product, with the Specification section number, permanent equipment tag numbers and applicable Drawing No.
6. Field dimensions, clearly identified as such.
7. Relation to adjacent or critical features of the Work or materials.
8. Applicable standards, such as ASTM or Federal Specification numbers.
9. Notification to the PM/CM in writing, at time of submissions, of any deviations on the submittals from requirements of the Contract Documents.
10. Identification of revisions on resubmittals.
11. An 8 x 3-inch blank space for Contractor and Designer stamps.
12. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of products, field measurements and field construction criteria and coordination of the information within the submittal with requirements of the Work and of Contract Documents.
13. Submittal sheets or drawings showing more than the particular item under consideration shall have all but the pertinent description of the item for which review is requested crossed out.

### **1.03 ROUTING OF SUBMITTALS**

- A. Submittals and routine correspondence shall be routed as follows:
  - 1. Supplier to Contractor (through representative if applicable)
  - 2. Contractor to PM/CM
  - 3. PM/CM to Designer
  - 4. Designer to PM/CM
  - 5. PM/CM to Contractor and Owner
  - 6. Contractor to Supplier

## **PART 2 PRODUCTS**

### **2.01 SHOP DRAWINGS**

- A. Unless otherwise specifically directed by the PM/CM, make all shop drawings accurately to a scale sufficiently large to show all pertinent features of the item and its method of connection to the Work.
- B. Submit all shop assembly drawings, larger than 11 x 17-inches, in the form of one reproducible transparency with two opaque prints or bluelines.
- C. Submit all shop drawings, 11 x 17-inches and smaller, in the form of six opaque prints or bluelines.
- D. One reproducible for all submittals larger than 11 x 17-inches and no more than three prints of other submittals will be returned to the Contractor.

### **2.02 MANUFACTURER'S LITERATURE**

- A. Where content of submitted literature from manufacturers includes data not pertinent to this submittal, clearly indicate which portion of the contents is being submitted for the Designer's review.
- B. Submit the number of copies which are required to be returned (not to exceed three) plus four copies which will be retained by the PM/CM.

## **2.03 SAMPLES**

- A. Samples shall illustrate materials, equipment or workmanship and established standards by which completed work is judged.
- B. Unless otherwise specifically directed by the PM/CM, all samples shall be of the precise article proposed to be furnished.
- C. Submit all samples in the quantity which is required to be returned plus one sample which will be retained by the PM/CM.

## **2.04 COLORS**

- A. Unless the precise color and pattern is specifically described in the Contract Documents, wherever a choice of color or pattern is available in a specified product, submit accurate color charts and pattern charts to the PM/CM for review and selection.
- B. Unless all available colors and patterns have identical costs and identical wearing capabilities, and are identically suited to the installation, completely describe the relative costs and capabilities of each.

# **PART 3 EXECUTION**

## **3.01 CONTRACTOR'S COORDINATION OF SUBMITTALS**

- A. Prior to submittal for the Designer's review, the Contractor shall use all means necessary to fully coordinate all material, including the following procedures:
  - 1. Determine and verify all field dimensions and conditions, catalog numbers and similar data.
  - 2. Coordinate as required with all trades and all public agencies involved.
  - 3. Submit a written statement of review and compliance with the requirements of all applicable technical Specifications as well as the requirements of this Section.
  - 4. Clearly indicate in a letter or memorandum on the manufacturer's or fabricator's letterhead, all deviations from the Contract Documents.
- B. Each and every copy of the shop drawings and data shall bear the Contractor's stamp showing that they have been so checked. Shop drawings submitted to the PM/CM without the Contractor's stamp will be returned to the Contractor for conformance with

this requirement.

- C. The Owner may backcharge the Contractor for costs associated with having to review a particular shop drawing, product data or sample more than two times to receive a "No Exceptions Taken" mark.
- D. Grouping of Submittals
  - 1. Unless otherwise specifically permitted by the PM/CM, make all submittals in groups containing all associated items.
  - 2. No review will be given to partial submittals of shop drawings for items which interconnect and/or are interdependent. It is the Contractor's responsibility to assemble the shop drawings for all such interconnecting and/or interdependent items, check them and then make one submittal to the PM/CM along with Contractor's comments as to compliance, non-compliance or features requiring special attention.
- E. Schedule of Submittals: Within 20 days of Contract award and prior to any shop drawing submittal, the Contractor shall submit a schedule showing the estimated date of submittal and the desired approval date for each shop drawing anticipated. A reasonable period shall be scheduled for review and comments. Time lost due to unacceptable submittals shall be the Contractor's responsibility and some time allowance for resubmittal shall be provided. The schedule shall provide for submittal of items which relate to one another to be submitted concurrently.

### **3.02 TIMING OF SUBMITTALS**

- A. Make all submittals far enough in advance of scheduled dates for installation to provide all required time for reviews, for securing necessary approvals, for possible revision and resubmittal, and for placing orders and securing delivery.
- B. In scheduling, allow sufficient time for the Designer's review following the receipt of the submittal.

### **3.03 REVIEWED SHOP DRAWINGS**

- A. PM/CM Review
  - 1. Allow a minimum of 5 days for the PM/CM's initial processing of each submittal requiring review and response, except allow longer periods where processing must be delayed for coordination with subsequent submittals. The PM/CM will advise the Contractor promptly when it is determined that a submittal being



processed must be delayed for coordination. Allow a minimum of 2 days for reprocessing each submittal. Advise the PM/CM on each submittal as to whether processing time is critical to progress of the Work, and therefore the Work would be expedited if processing time could be foreshortened.

2. Acceptable submittals will be marked "No Exceptions Taken". A minimum of four copies will be retained by the PM/CM for PM/CM's, Designer's and the Owner's use and the remaining copies will be returned to the Contractor.
  3. Submittals requiring minor corrections before the product is acceptable will be marked "Make Corrections Noted". The Contractor may order, fabricate and ship the items included in the submittals, provided the indicated corrections are made. Drawings must be resubmitted for review and marked "No Exceptions Taken" prior to installation or use of products.
  4. Submittals marked "Amend and Resubmit" must be revised to reflect required changes and the initial review procedure repeated.
  5. The "Rejected - See Remarks" notation is used to indicate products which are not acceptable. Upon return of a submittal so marked, the Contractor shall repeat the initial review procedure utilizing acceptable products.
  6. Only two copies of items marked "Amend and Resubmit" and "Rejected - See Remarks" will be reviewed and marked. One copy will be retained by the PM/CM and the other copy with all remaining unmarked copies will be returned to the Contractor for resubmittal.
- B. No work or products shall be installed without a drawing or submittal bearing the "No Exceptions Taken" notation. The Contractor shall maintain at the job site a complete set of shop drawings bearing the Designer's stamp.
- C. Substitutions: In the event the Contractor obtains the Designer's approval for the use of products other than those which are listed first in the Contract Documents, the Contractor shall, at the Contractor's own expense and using methods approved by the Designer, make any changes to structures, piping and electrical work that may be necessary to accommodate these products.
- D. Use of the "No Exceptions Taken" notation on shop drawings or other submittals is general and shall not relieve the Contractor of the responsibility of furnishing products of the proper dimension, size, quality, quantity, materials and all performance characteristics, to efficiently perform the requirements and intent of the Contract Documents. The Designer's review shall not relieve the Contractor of responsibility for errors of any kind on the shop drawings. Review is intended only to assure

conformance with the design concept of the Project and compliance with the information given in the Contract Documents. The Contractor is responsible for dimensions to be confirmed and correlated at the job site. The Contractor is also responsible for information that pertains solely to the fabrication processes or to the technique of construction and for the coordination of the work of all trades.

### **3.04 RESUBMISSION REQUIREMENTS**

#### **A. Shop Drawings**

1. Revise initial drawings as required and resubmit as specified for initial submittal, with the resubmittal number shown.
2. Indicate on drawings all changes which have been made other than those requested by the Designer.

#### **B. Project Data and Samples: Resubmit new data and samples as specified for initial submittal, with the resubmittal number shown.**

END OF SECTION

**SECTION 01510**  
**Temporary Facilities**

**PART 1 GENERAL**

**1.01 SCOPE**

- A. Temporary facilities required for this work include, but are not necessarily limited to:
  - 1. Temporary utilities such as water and electricity.
  - 2. First aid facilities.
  - 3. Sanitary facilities.
  - 4. Potable water.
  - 5. Temporary enclosures and construction facilities.
  - 6. Temporary heat.

**1.02 GENERAL**

- A. First aid facilities, sanitary facilities and potable water shall be available on the Project site on the first day that any activities are conducted on site. The other facilities shall be provided as the schedule of the Project warrants.
- B. Maintenance: Use all means necessary to maintain temporary facilities in proper and safe condition throughout progress of the Work. In the event of loss or damage, immediately make all repairs and replacements necessary, at no additional cost to the Owner.
- C. Removal: Remove all such temporary facilities and controls as rapidly as progress of the Work will permit.

**1.03 TEMPORARY UTILITIES**

- A. General
  - 1. Provide and pay all costs for all water, electricity and other utilities required for the performance of the Work.
  - 2. Pay all costs for temporary utilities until Project completion.

3. Costs for temporary utilities shall include all power, water and the like necessary for testing equipment as required by the Contract Documents.
- B. Temporary Water: Provide all necessary temporary piping, and upon completion of the Work, remove all such temporary piping. Provide and remove water meters.
- C. Temporary Electricity
1. Provide all necessary wiring for the Contractor's use.
  2. Furnish, locate and install area distribution boxes such that the individual trades may use, their own construction type extension cords to obtain adequate power, and artificial lighting at all points where required by inspectors and for safety.

#### **1.04 FIRST AID FACILITIES**

The Contractor shall provide a suitable first aid station, equipped with all facilities and medical supplies necessary to administer emergency first aid treatment. The Contractor shall have standing arrangements for the removal and hospital treatment of any injured person. All first aid facilities and emergency ambulance service shall be made available by the Contractor to the Owner and the PM/CM's personnel.

#### **1.05 SANITARY FACILITIES**

Prior to starting the Work, the Contractor shall furnish, for use of Contractor's personnel on the job, all necessary toilet facilities which shall be secluded from public observation. These facilities shall be either chemical toilets or shall be connected to the Owner's sanitary sewer system. All facilities, regardless of type, shall be kept in a clean and sanitary condition and shall comply with the requirements and regulations of the area in which the Work is performed. Adequacy of these facilities will be subject to the PM/CM's review and maintenance of same must be satisfactory to the PM/CM at all times.

#### **1.06 POTABLE WATER**

The Contractor shall be responsible for furnishing a supply of potable drinking water for employees, subcontractors, inspectors, PM/CM and the Owner who are associated with the Work.

#### **1.07 ENCLOSURES AND CONSTRUCTION FACILITIES**

Furnish, install and maintain for the duration of construction, all required scaffolds, tarpaulins, canopies, steps, bridges, platforms and other temporary construction necessary for proper completion of the Work in compliance with all pertinent safety and other regulations.

**1.08      PARKING FACILITIES**

Parking facilities for the Contractor's and Contractor's subcontractors' personnel shall be the Contractor's responsibility. The Contractor's employees shall not park in the public R.O.W. or on private land without the permission of the land owner. The storage and work facilities provided by the Owner will not be used for parking by the Contractor's or subcontractor's personnel.

END OF SECTION

**SECTION 01540**  
**Job Site Security**

**PART 1 GENERAL**

**1.01 BARRICADES, LIGHTS AND SIGNALS**

- A. The Contractor shall furnish and erect such barricades, fences, lights and danger signals and shall provide such other precautionary measures for the protection of persons or property and of the Work as necessary. Barricades shall be painted in a color that will be visible at night. From sunset to sunrise, the Contractor shall furnish and maintain at least one light at each barricade and sufficient numbers of barricades shall be erected to keep vehicles from being driven on or into any Work under construction.
- B. The Contractor will be held responsible for all damage to the Work due to failure of barricades, signs and lights and whenever evidence is found of such damage, the Contractor shall immediately remove the damaged portion and replace it at Contractor's cost and expense. The Contractor's responsibility for the maintenance of barricades, signs and lights shall not cease until the Project has been accepted by the Owner.

END OF SECTION

**SECTION 01610**  
**Transportation and Handling**

**PART 1 GENERAL**

**1.01 SCOPE**

- A. The Contractor shall provide transportation of all equipment, materials and products furnished under these Contract Documents to the Work site. In addition, the Contractor shall provide preparation for shipment, loading, unloading, handling and preparation for installation and all other work and incidental items necessary or convenient to the Contractor for the satisfactory prosecution and completion of the Work.
- B. All equipment, materials and products damaged during transportation or handling shall be repaired or replaced by the Contractor at no additional cost to the Owner prior to being incorporated into the Work.

**1.02 TRANSPORTATION**

- A. All equipment shall be suitably boxed, crated or otherwise protected during transportation.
- B. Where equipment will be installed using existing cranes or hoisting equipment, the Contractor shall ensure that the weights of the assembled sections do not exceed the capacity of the cranes or hoisting equipment.
- C. Small items and appurtenances such as gauges, valves, switches, instruments and probes which could be damaged during shipment shall be removed from the equipment prior to shipment, packaged and shipped separately. All openings shall be plugged or sealed to prevent the entrance of water or dirt.

**1.03 HANDLING**

- A. All equipment, materials and products shall be carefully handled to prevent damage or excessive deflections during unloading or transportation.
- B. Lifting and handling drawings and instructions furnished by the manufacturer or supplier shall be strictly followed. Eyebolts or lifting lugs furnished on the equipment shall be used in handling the equipment. Shafts and operating mechanisms shall not be used as lifting points. Spreader bars or lifting beams shall be used when the distance between lifting points exceeds that permitted by standard industry practice.
- C. Under no circumstances shall equipment or products such as pipe, structural steel, castings, reinforcement, lumber, piles, poles, etc., be thrown or rolled off of trucks onto

the ground.

- D. Slings and chains shall be padded as required to prevent damage to protective coatings and finishes.

END OF SECTION



**SECTION 01611**  
**Storage and Protection**

**PART 1 GENERAL**

**1.01 SCOPE**

The work under this Section includes, but is not necessarily limited to, the furnishing of all labor, tools and materials necessary to properly store and protect all materials, equipment, products and the like, as necessary for the proper and complete performance of the Work.

**1.02 STORAGE AND PROTECTION**

A. Storage

1. Maintain ample way for foot traffic at all times, except as otherwise approved by the PM/CM.
2. All property damaged by reason of storing of material shall be properly replaced at no additional cost to the Owner.
3. Packaged materials shall be delivered in original unopened containers and so stored until ready for use.
4. All materials shall meet the requirements of these Specifications at the time that they are used in the Work.
5. Store products in accordance with manufacturer's instructions.

B. Protection

1. Use all means necessary to protect the materials, equipment and products of every section before, during and after installation and to protect the installed work and materials of all other trades.
2. All materials shall be delivered, stored and handled to prevent the inclusion of foreign materials and damage by water, breakage, vandalism or other causes.
3. Substantially constructed weathertight storage sheds, with raised floors, shall be provided and maintained as may be required to adequately protect those materials and products stored on the site which may require protection from damage by the elements.

- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary for the approval of the PM/CM and at no additional cost to the Owner.
- D. Equipment and products stored outdoors shall be supported above the ground on suitable wooden blocks or braces arranged to prevent excessive deflection or bending between supports. Items such as pipe, structural steel and sheet construction products shall be stored with one end elevated to facilitate drainage.
- E. Unless otherwise permitted in writing by the PM/CM, building products and materials such as cement, grout, plaster, gypsumboard, particleboard, resilient flooring, acoustical tile, paneling, finish lumber, insulation, wiring, etc., shall be stored indoors in a dry location. Building products such as rough lumber, plywood, concrete block and structural tile may be stored outdoors under a properly secured waterproof covering.
- F. Tarps and other coverings shall be supported above the stored equipment or materials on wooden strips to provide ventilation under the cover and minimize condensation. Tarps and covers shall be arranged to prevent ponding of water.

### **1.03 EXTENDED STORAGE**

In the event that certain items of major equipment such as air compressors, pumps and mechanical aerators have to be stored for an extended period of time, the Contractor shall provide satisfactory long-term storage facilities which are acceptable to the PM/CM. The Contractor shall provide all special packaging, protective coverings, protective coatings, power, nitrogen purge, desiccants, lubricants and exercising necessary or recommended by the manufacturer to properly maintain and protect the equipment during the period of extended storage.

END OF SECTION

**SECTION 01630**  
**Substitutions and Product Options**

**PART 1 GENERAL**

**1.01 SCOPE**

This Section outlines the restrictions and requirements for substitutions, product and manufacturer options, and construction method options.

**1.02 DEFINITIONS**

- A. For the purposes of these Contract Documents, a "substitute item" shall be defined as one of the following:
  - 1. A product or manufacturer offered as a replacement to a specified product or manufacturer.
  - 2. A product or manufacturer offered in addition to a specified product or manufacturer.
- B. For the purposes of these Contract Documents, a "substitute construction method" shall be defined as one of the following:
  - 1. A mean, method, technique, sequence or procedure of construction offered as a replacement for a specified mean, method, technique, sequence or procedure of construction.
  - 2. A mean, method, technique, sequence or procedure of construction offered in addition to a specified mean, method, technique, sequence or procedure of construction.

**1.03 GENERAL**

- A. An item or construction method, which is offered where no specific product, manufacturer, mean, method, technique, sequence or procedure of construction is specified or shown on the Drawings, shall not be considered a substitute and shall be at the option of the Contractor, subject to the provisions in the Contract Documents for that item or construction method.
- B. For products specified only by a referenced standard, the Contractor may select any product by any manufacturer, which meets the requirements of the Specifications, unless indicated otherwise in the Contract Documents.

- C. If the manufacturer is named on the Drawings or in the Specifications as an acceptable manufacturer, products of that manufacturer meeting all requirements of the Specifications and Drawings are acceptable.
- D. Whenever the Designer's design is based on a specific product of a particular manufacturer, that manufacturer will be shown on the Drawings and/or listed first in the list of approved manufacturers in the Specifications. Any Bidder intending to furnish products of other than the first listed manufacturer, or furnish substitute items, shall
  - 1. Verify that the item being furnished will fit in the space allowed, perform the same functions and have the same capabilities as the item specified.
  - 2. Include in its Bid the cost of all accessory items which may be required by the other listed substitute product,
  - 3. Include the cost of any architectural, structural, mechanical, piping, electrical or other modifications required, and
  - 4. Include the cost of required additional work by the PM/CM, if any, to accommodate the item.
- E. Whenever a product specification includes minimum experience requirements which the manufacturer selected by the Contractor cannot meet, the manufacturer shall furnish the Owner with a cash deposit, or bond acceptable to the Owner in an amount equal to the cost of the product, which shall remain in effect until the experience requirement has been met.

#### **1.04 APPROVALS**

- A. Approval, of a substitution as an acceptable manufacturer, of the PM/CM is dependent on determination that the product offered
  - 1. Is essentially equal in function, performance, quality of manufacture, ease of maintenance, reliability, service life and other criteria to that on which the design is based, and
  - 2. Will require no major modifications to structures, electrical systems, control systems or piping systems.

#### **1.05 SUBSTITUTIONS AND OPTIONS**

- A. No substitutions will be considered for the manufacturers listed in the Bid.
- B. After Notice to Proceed
  - 1. Substitute items will be considered only if the term "equal to" precedes the names of acceptable manufacturers in the Specification.
  - 2. Where items are specified by referenced standard or specified as indicated in Article 1.03, Paragraph A. above, such items shall be submitted to the PM/CM for review.
  - 3. The Contractor shall submit shop drawings on the substitute item for the PM/CM's review in accordance with the Section 01340.
- C. Prior to Opening of Bids
  - 1. No consideration or approvals will be made for products specified by a referenced standard, or specified as indicated in Article 1.03, Paragraph A. above. Such consideration may occur only after the Notice to Proceed.
  - 2. No consideration or approvals will be made for products being offered where the term "equal to" precedes the name of an approved product. Such substitution consideration may occur only after the Notice to Proceed.

END OF SECTION

**SECTION 01710**  
**Cleaning**

**PART 1 GENERAL**

**1.01 SCOPE**

This Section covers the general cleaning which the Contractor shall be required to perform both during construction and before final acceptance of the Project unless otherwise shown on the Drawings or specified elsewhere in these Specifications.

**1.02 QUALITY ASSURANCE**

- A. Daily, and more often if necessary, conduct inspections verifying that requirements of cleanliness are being met.
- B. In addition to the standards described in this Section, comply with all pertinent requirements of governmental agencies having jurisdiction.

**1.03 HAZARDOUS MATERIAL AND WASTE**

- A. The Contractor shall handle hazardous waste and materials in accordance with applicable local, state, and federal regulations. Waste shall also be disposed of in approved landfills as applicable.
- B. The Contractor shall prevent accumulation of wastes which create hazardous conditions.
- C. Burning or burying rubbish and waste materials on the site shall not be allowed.
- D. Disposal of hazardous wastes or materials into sanitary or storm sewers shall not be allowed.

**1.04 DISPOSAL OF SURPLUS MATERIALS**

Unless otherwise shown on the Drawings, specified or directed, the Contractor shall legally dispose off the site all surplus materials and equipment from demolition and shall provide suitable off-site disposal site, or utilize a site designated by the Owner.

## **PART 2 PRODUCTS**

### **2.01 CLEANING MATERIALS AND EQUIPMENT**

Provide all required personnel, equipment and materials needed to maintain the specified standard of cleanliness.

### **2.02 COMPATIBILITY**

Use only the cleaning materials, methods and equipment which are compatible with the surface being cleaned, as recommended by the manufacturer of the material or as approved by the PM/CM.

## **PART 3 EXECUTION**

### **3.01 PROGRESS CLEANING**

#### **A. General**

1. Do not allow the accumulation of scrap, debris, waste material and other items not required for construction of this Work.
2. Daily, completely remove all scrap, debris and waste material from the job site.
3. Provide adequate storage for all items awaiting removal from the job site, observing all requirements for fire protection and protection of the environment.

#### **B. Site**

1. Daily, and more often if necessary, inspect the site and pick up all scrap, debris and waste material. Remove all such items to the place designated for their storage.
2. Restack materials stored on site weekly.
3. At all times maintain the site in a neat and orderly condition which meets the approval of the PM/CM.

#### **C. Structures**

1. Weekly, and more often if necessary, inspect the structures and pick up all scrap, debris and waste material. Remove all such items to the place designated for their storage.
2. Weekly, and more often if necessary, sweep all interior spaces clean. "Clean", for the purpose of this subparagraph, shall be interpreted as meaning free from dust and other material capable of being removed by using a hand-held broom.
3. As required preparatory to installation of successive materials, clean the structures or pertinent portions as recommended by the manufacturer of the successive material.
4. Following the installation of finish floor materials, clean the finish floor daily. "Clean", for the purpose of this paragraph, shall be interpreted as meaning free from all foreign material which, in the opinion of the PM/CM, may be injurious to the finish floor material.
5. Schedule cleaning operation so that dust and other contaminants resulting from cleaning operations will not fall on wet, recently painted surfaces.

### **3.02 FINAL CLEANING**

- A. Definitions: Unless otherwise specifically specified, "clean" for the purpose of this Article shall be interpreted as the level of cleanliness generally provided by commercial building maintenance subcontractors using commercial quality building maintenance equipment and materials.
- B. General: Prior to completion of the Work, remove from the job site all tools, surplus materials, equipment, scrap, debris and waste. Conduct final progress cleaning as described in 3.01 above.
- C. Site: Unless otherwise specifically directed by the PM/CM, hose down all paved areas on the site and all public sidewalks directly adjacent to the site; rake clean other surfaces of the grounds. Completely remove all resultant debris.
- D. Structures
  1. Remove all traces of soil, waste material, splashed material, and other foreign matter to provide a uniform degree of exterior cleanliness. Visually inspect all exterior surfaces and remove all traces of soil, waste material, and other foreign matter. Remove all traces of splashed materials from adjacent surfaces. If necessary to achieve a uniform degree of exterior cleanliness, hose down the exterior of the structure. In the event of stubborn stains not removable with water, the PM/CM may require light sandblasting or other cleaning at no



additional cost to the Owner.

2. Visually inspect all interior surfaces and remove all traces of soil, waste material, smudges and other foreign matter. Remove all paint droppings, spots, stains and dirt from finished surfaces.
  3. Clean all glass inside and outside.
  4. Polish all surfaces requiring the routine application of buffed polish. Provide and apply polish as recommended by the manufacturer of the material being polished.
- E. Post-Construction Cleanup: All evidence of temporary construction facilities, haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess or waste materials, or any other evidence of construction, shall be removed as directed by the PM/CM.
- F. Restoration of Landscape Damage: Any landscape feature damaged by the Contractor shall be restored as nearly as possible to its original condition at the Contractor's expense. The PM/CM will decide what method of restoration shall be used.
- G. Timing: Schedule final cleaning as approved by the PM/CM to enable the Owner to accept the Project.

### **3.03 CLEANING DURING OWNER'S OCCUPANCY**

Should the Owner occupy the Work or any portion thereof prior to its completion by the Contractor and acceptance by the Owner, responsibilities for interim and final cleaning of the occupied spaces shall be as determined by the PM/CM in accordance with the Supplementary Conditions of the Contract Documents.

END OF SECTION

\

**SECTION 01720**  
**Record Documents**

**PART 1 GENERAL**

**1.01 SCOPE**

- A. The work under this Section includes, but is not necessarily limited to, the compiling, maintaining, recording and submitting of project record documents as herein specified.
- B. Record documents include, but are not limited to:
  - 1. Drawings;
  - 2. Specifications;
  - 3. Change orders and other modifications to the Contract;
  - 4. Field orders or written instructions, including Requests for Information (RFI) and Clarification Memorandums;
  - 5. Reviewed shop drawings, product data and samples;
  - 6. Test records.
- C. The Contractor shall maintain on the Project site throughout the Contract Time an up to date set of Record Drawings.

**1.02 MAINTENANCE OF DOCUMENTS AND SAMPLES**

- A. Storage
  - 1. Store documents and samples in the Contractor's field office, apart from documents used for construction.
  - 2. Provide files and racks for storage of documents.
  - 3. Provide locked cabinet or secure storage space for storage of samples.
- B. File documents and samples in accordance with format of these Specifications.

C. Maintenance

1. Maintain documents in a clean, dry, legible condition and in good order.
2. Do not use record documents for construction purposes.
3. Maintain at the site for the Owner one copy of all record documents.

D. Make documents and samples available at all times for inspection by PM/CM.

E. Failure to maintain the Record Documents in a satisfactory manner may be cause for withholding of a certificate for payment.

**1.03 QUALITY ASSURANCE**

A. Unless noted otherwise, Record Drawings shall provide dimensions, distances and coordinates to the nearest 0.1 foot.

B. Unless noted otherwise, Record Drawings shall provide elevations to the nearest 0.01 foot for all pertinent items constructed by the Contractor.

**1.04 RECORDING**

A. Label each document "PROJECT RECORD" in neat, large printed letters.

B. Recording

1. Record information concurrently with construction progress.
2. Do not conceal any work until required information is recorded.

**1.05 RECORD DRAWINGS**

A. Record Drawings shall be reproducible, shall have a title block indicating that the drawings are Record Drawings, the name of the company preparing the Record Drawings, and the date the Record Drawings were prepared. The Contractor will be provided paper sepias of the Drawings, or it may elect to provide reproducible drawings via another method. Reproducible shall be defined as being translucent so as to allow a blueline print to be produced.

B. Legibly mark drawings to record actual construction, including:

1. All Construction
  - a. Changes of dimension and detail.
  - b. Changes made by Requests for Information (RFI), field order, clarification memorandums or by change order.
  - c. Details not on original Drawings.
2. Site Improvements, Including Underground Utilities
  - a. Horizontal and vertical locations of all exposed and underground utilities and appurtenances, both new facilities constructed and those utilities encountered, referenced to permanent surface improvements.
  - b. Location of and dimensions of roadways and parking areas, providing dimensions to back of curb when present.
  - c. The locations shall be referenced to at least two easily identifiable, permanent landmarks (e.g., power poles, valve markers, etc.) or benchmarks.
3. Structures
  - a. Depths of various elements of foundation in relation to finish first floor datum or top of wall.
  - b. Location of internal and buried utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.

## **1.06 SPECIFICATIONS**

- A. Legibly mark each section to record:
  1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
  2. Changes made by Requests for Information (RFI), field order, clarification memorandums, or by change order.

## **1.07 SUBMITTAL**

- A. At contract closeout, deliver Record Documents to the PM/CM for the Owner.
- B. Accompany submittal with transmittal letter, in duplicate, containing:
  1. Date

2. Project title and number
3. Contractor's name and address
4. Title and number of each record document
5. Signature of Contractor or Contractor's authorized representative

END OF SECTION

**SECTION 01740**  
**Warranties and Bonds**

**PART 1 GENERAL**

**1.01 PROJECT MAINTENANCE AND WARRANTY**

- A. Maintain and keep in good repair the Work covered by these Drawings and Specifications until acceptance by the Owner.
- B. The Contractor shall warrant for a period of one year from the date of Owner's written acceptance of certain segments of the Work and/or Owner's written final acceptance of the Project, as defined in the Contract Documents, that the completed Work is free from all defects due to faulty products or workmanship and the Contractor shall promptly make such corrections as may be necessary by reason of such defects. The Owner will give notice of observed defects with reasonable promptness. In the event that the Contractor should fail to make such repairs, adjustments or other work that may be made necessary by such defects, the Owner may do so and charge the Contractor the cost thereby incurred. The Performance Bond shall remain in full force and effect throughout the warranty period.
- C. The Contractor shall not be obligated to make replacements which become necessary because of ordinary wear and tear, or as a result of improper operation or maintenance, or as a result of improper work or damage by another Contractor or the Owner, or to perform any work which is normally performed by a maintenance crew during operation.
- D. In the event of multiple failures of major consequences prior to the expiration of the one year warranty described above, the affected unit shall be disassembled, inspected and modified or replaced as necessary to prevent further occurrences. All related components which may have been damaged or rendered non-serviceable as a consequence of the failure shall be replaced. A new 12 month warranty against defective or deficient design, workmanship, and materials shall commence on the day that the item is reassembled and placed back into operation. As used herein, multiple failure shall be interpreted to mean two or more successive failures of the same kind in the same item or failures of the same kind in two or more items. Major failures may include, but are not limited to, cracked or broken housings, piping, or vessels, excessive deflections, bent or broken shafts, broken or chipped gear teeth, premature bearing failure, excessive wear or excessive leakage around seals. Failures which are directly and clearly traceable to operator abuse, such as operations in conflict with published operating procedures or improper maintenance, such as substitution of unauthorized replacement parts, use of incorrect lubricants or chemicals, flagrant over-or under-lubrication and using maintenance procedures not conforming with

published maintenance instructions, shall be exempted from the scope of the one year warranty.

- D. Should multiple failures occur in a given item, all products of the same size and type shall be disassembled, inspected, modified or replaced as necessary and rewarranted for one year.
- E. The Contractor shall, at Contractor's own expense, furnish all labor, materials, tools and equipment required and shall make such repairs and removals and shall perform such work or reconstruction as may be made necessary by any structural or functional defect or failure resulting from neglect, faulty workmanship or faulty materials, in any part of the Work performed by the Contractor. Such repair shall also include refilling of trenches, excavations or embankments which show settlement or erosion after backfilling or placement.
- F. Except as noted on the Drawings or as specified, all structures such as embankments and fences shall be returned to their original condition prior to the completion of the Contract. Any and all damage to any facility not designated for removal, resulting from the Contractor's operations, shall be promptly repaired by the Contractor at no cost to the Owner.
- G. The Contractor shall be responsible for all road and entrance reconstruction and repairs and maintenance of same for a period of one year from the date of final acceptance. In the event the repairs and maintenance are not made immediately and it becomes necessary for the owner of the road to make such repairs, the Contractor shall reimburse the owner of the road for the cost of such repairs.
- H. In the event the Contractor fails to proceed to remedy the defects upon notification within 15 days of the date of such notice, the Owner reserves the right to cause the required materials to be procured and the work to be done, as described in the Drawings and Specifications, and to hold the Contractor and the sureties on Contractor's bond liable for the cost and expense thereof.
- I. Notice to Contractor for repairs and reconstruction will be made in the form of a registered letter addressed to the Contractor at Contractor's home office.
- J. Neither the foregoing paragraphs nor any provision in the Contract Documents, nor any special guarantee time limit implies any limitation of the Contractor's liability within the law of the place of construction.

END OF SECTION

## **DIVISION 2 - SITEWORK**

### **SECTION 02110 Easement Clearing**

#### **PART 1 GENERAL**

##### **1.02 WORK THIS SECTION**

- A. The work to be performed under this specification shall consist of clearing vegetation from County easement areas and associated facility sites on a scheduled and/or emergency basis. (In the following discussion “easement” refers to easement areas and associated facility sites.).
- B. While easement clearing **does not** require the removal of all trees it will remove those trees and other vegetation that might otherwise hinder infiltration/inflow investigations, sewer system repairs or access.

##### **1.03 REFERENCES**

- A. Water and Wastewater Standards and Specifications, Rockdale Water Resources
- B. General Conditions for Rockdale County Construction Contracts, Rockdale County

##### **1.04 DEFINITIONS (None Cited)**

##### **1.05 QUALIFICATIONS**

- A. Qualification documentation will be submitted as a part of all the Bids.
- B. The Contractor must meet all of the following criteria to be considered qualified to propose and/or bid on the subject contract.
  - 1. The Contractor, or their subcontractor, must document that they, not their parent company or related company or the experience of an individual/s, have been in this line of business a minimum of five (5) years.
  - 2. The Contractor, or their subcontractor, must document that they, not their parent company or related company or the experience of an individual/s, have cleared a minimum of 1,000,000 square feet of easements/rights-of-way in the past two (2) years. This documentation shall include the mowing of grass,



clearing of brush and removal of trees of the diameters expected on this contract. This documentation shall include locations, references (including names and phone numbers), square footages and tree diameters.

#### **1.06 EXPERIENCE**

- A. Experience documentation will be submitted as a part of all the Bids. The Contractor shall provide the County with written documentation that the supervisor, field crew leaders and equipment operators responsible for this work have received the proper training, are certified, and have the requisite experience. This documentation will include dates of hands-on experience, employer, description of duties/experience, contact name and phone number. Documentation on any person shall not be longer than 1-page.
- B. Supervisor of the field crews must be properly trained in the function and have a minimum of five (5) years experience in performing easement clearing including safe working practices, proper clearing procedures, and experience in the types of clearing equipment that will be used for this contract.
- C. Field crew leaders must be properly trained in this function and have a minimum of three (3) years hands-on experience in performing easement including safe working practices, proper clearing procedures, and experience in the types of clearing equipment that will be used for this contract.
- D. Equipment operator must be properly trained in this function and have a minimum of two (2) years hands-on experience in performing easement including safe working practices, proper clearing procedures, and experience in the types of clearing equipment that will be used for this contract.
- E. Clearing laborers must be properly trained in this function including safe working practices, proper clearing procedures, and experience in the types of clearing equipment that will be used for this contract.

#### **1.6 PERSONNEL**

- A. The Supervisor must daily visit the project checking on their personnel and subcontractors, meeting with the field crew leaders as well as checking on the status and progress of the project.
- B. A field crew leader must be with their crew when their crew is working. Each field crew leader can only have one field crew. Each crew must have it's own field crew leader.

#### **1.7 MEASUREMENT AND PAYMENT**

- A. Payment for machine easement clearing shall be made at the unit price bid. Payment will be full compensation for furnishing all materials, supervision, labor, transportation, fuels, tools and equipment, necessary to perform all work including hand clearing around manholes, stream banks and other obstructions, removal or mulching of debris and taking all cleared items to ground level including tree stumps. Payment shall be made under Machine Easement Clearing, Light or Heavy, per square foot.
- B. Payment for hand easement clearing shall be made at the unit price bid. Payment will be full compensation for furnishing all materials, supervision, labor, transportation, fuels, tools and equipment, necessary to perform all work including hand clearing around manholes, stream banks and other obstructions, removal or mulching of debris and taking all cleared items to ground level including tree stumps. Payment shall be made under Hand Clearing, Light or Heavy, per square foot.
- C. Payment for selective tree removal shall be made at the unit price bid. Payment will be full compensation for furnishing all materials, supervision, labor, transportation, fuels, tools and equipment, necessary to perform all work. Payment shall be made under Selective Tree, 0"-14", 15"- 24" or 25"- 36" per each.
- D. Payment for stump grinding shall be made at the unit price bid. Payment will be full compensation for furnishing all materials, supervision, labor, transportation, fuels, tools and equipment necessary to perform all work. Payment shall be made under Stump Grinding, per Hour.
- E. Payment for Debris Chipping shall be made at the unit price bid. Payment will be full compensation for furnishing all materials, supervision, labor, transportation, fuels, tools and equipment necessary to perform all work. Payment shall be made under Debris Chipping, per Hour.

## **PART 2 -PRODUCTS**

- A. Blades on all equipment shall be kept sharp. Blades showing excessive wear or damage shall not be used. Brakes on all mowing equipment must be properly maintained and operative. All mowing equipment shall be equipped with safety guards to prevent the mowers from throwing rocks or debris. Guards shall be in place and in a down position while mowing is occurring.

## PART 3 -EXECUTION

### 3.1 GENERAL

- A. Easements that will be encountered can vary from wet, low lying next to creeks, streams and rivers, to easements in fully developed neighborhoods and business districts, to easements on sloped embankments, or work at county owned facilities.
- B. The easements to be cleared will be selected and assigned by Rockdale Water Resources personnel.
- C. On property where the owner has maintained the easement no tree/s will be removed without the written permission of the County.
- D. **The combination of 1) easement rating, 2) potential number/size of trees being considered for selective clearing and the 3) potential number/size of stumps being considered for stump grinding will be such that the County pays the lowest cost.**
- E. Easements or portions of an easement will be rated by the County per the following:
  - (1.) “Light” includes trees 0” up to 4” in diameter.
  - (1.) “Heavy” includes trees from 5”-36” in diameter.

All ratings include hand clearing around manholes, stream banks and other obstructions. All ratings include taking all cleared items, including tree stumps, to ground level.

- F. Selective Tree Removal: Whenever trees are located a minimum of five (5) feet from the centerline of an easement or will hinder infiltration/inflow investigations and repairs; the County may approve selective tree removal. The Contractor shall be responsible for obtaining written County approval before performing selective tree removal. Trees to be removed must be documented, including DBH, and signed by the County Inspector prior to removal. Trees removed without this documentation will not be billable.
- G. Trees for potential selective clearing will be categorized as follows:
  - (1.) “Selective Tree-0”- 14” includes trees greater than 0, up to 14-inches in diameter,
  - (1.) “Selective Tree-15”- 24” includes trees greater than 14, up to 24-inches in diameter,
  - (1.) “Selective Tree-25”- 36” includes trees greater than 24, up to 36-inches in diameter,

All selective tree removals include removal to ground level.

- H. Tree stumps for potential grinding will be categorized as follows:
  - (1.) “Stump Grinding- per hour includes trees greater than 0 to 36-inches in diameter
- I. The Contractor will meet with the County Representative to review the rating and potential selective tree clearing of each easement prior to beginning work.
- J. If the Contractor disagrees with the easement rating and/or the potential selective tree clearing then the disagreement must be presented to the Project Manager, for resolution. The decision of the Project Manager is final.
- K. The Contractor must locate the next nearest manhole prior to clearing the easement between the two manholes. After locating the next nearest manhole a line will be drawn between the manholes and both the centerline and the easement boundaries marked. This marking of the easement will be done to prevent damage to the next nearest manhole and to ensure the Contractor stays within the easement boundaries.
- L. The diameter of trees shall be measured at the diameter breast height (DBH) - approximately four feet above ground level. This diameter will be used to rate each easement for clearing, for selective tree removal.
- M. Height of Cut: The Contractor shall clear grasses, trees, bushes and brush within easement to ground level. No stubs or stumps will be allowed to remain above ground level that could cause personal injury or damage to County vehicles fitted with passenger grade street tires. This height of cut applies to mechanical as well as hand cleared areas.
- N. All grasses, debris, trees, brush etc. will be removed from the easement or mulched and uniformly spread on the easement. The County Inspector must approve mulching of the debris. The County Inspector, prior to being spread, must approve the quality of the mulch. Burning or burying will not be allowed. Excessive thickness of mulch will not be allowed. The Contractor may be required to relocate or disturb excessive amount of mulch in other County easements. This relocation or redistribution of mulched debris is included in other easement clearing unit prices.
- O. Width of Cut: Typically the width of cut will be from edge of easement to edge of easement unless otherwise directed by the County Representative. Typically the easements are 20 feet wide. Typically the limits of the clearing shall be measured 10 feet from either side of the center of the pipeline however the County may direct a wider or narrower width to be cleared.

### 3.2 PUBLIC NOTIFICATION

- A. Per the County easement clearing policy the County will attempt to notify all affected landowners a minimum of 45 calendar days in advance of initial clearing of an easement; subsequent easement maintenance (re-cuts) may be done without notification.
- B. The Contractor will be responsible for notifying all property owners via advance notice flyers a minimum of five (5) working days prior to clearing on their property. The County must approve verbiage used on the notice.
- C. If a conflict arises with a property owner, the Contractor shall notify the County Representative immediately.
- D. The Contractor will provide and place “Right-of-Way” signs in prominent locations where easement clearing is planned 24-hours in advance of commencing the work. Signs will be a minimum of 24 inches wide by 18 inches high with the main message in a minimum of 2.5-inches high letters. Contractor name and phone number will be in a minimum of 1.5-inch high letters. Signs will be supported a minimum of 12 inches above grade by integral metal frames. Wording on the signs shall be similar to the following:

**“EASEMENT CLEARING”**

**“Contractor Name” and “Phone Number”**

- E. The right-of-way signs will be placed in the right-of-ways of affected properties and where easements cross right-of-ways.
- F. The right-of-way signs shall be moved along with and in front of the work progress.

### 3.3 DOCUMENTATION

- A. The Contractor shall complete work on each asset as assigned via the County’s Computerized Work Order Management system. Upon start of work, the Contractor shall receive work orders as assigned by the Project Manager. The Contractor shall utilize the Mobile Work Manager to maintain and synchronize the status of each rehabilitation work order issued.

END OF SECTION

**SECTION 02125**  
**Erosion and Sedimentation Control**

**PART 1 GENERAL**

**1.01 SCOPE**

A. Submittals and Permits

1. The Designer shall prepare a description, drawings and schedule for proposed temporary and permanent erosion and sedimentation controls. The description and drawings shall meet the requirements of the Georgia Erosion and Sedimentation Act of 1975 as amended in 2003, local soil erosion and sedimentation control ordinances and RWR Standards and Specifications. The Owner will acquire Land Disturbance Permits from the appropriate authority and shall pay any fees for said permits. All fines imposed for improper erosion and sedimentation control shall be paid by the Contractor.
2. Land disturbance activity shall not commence until the Land Disturbance Permit is issued.

B. Basic Principles

1. Conduct the earthwork and excavation activities in such a manner to fit the topography, soil type and condition.
2. Minimize the disturbed area and the duration of exposure to erosion elements.
3. Stabilize disturbed areas immediately.
4. Safely convey run-off from the site to an outlet such that erosion will not be increased off site.
5. Retain sediment on site that was generated on site.
6. Minimize encroachment upon watercourses.

C. Implementation

1. The Contractor is solely responsible for the control of erosion within the Project site and the prevention of sedimentation from leaving the Project site or entering waterways.

2. The Contractor shall install temporary and permanent erosion and sedimentation controls which will ensure that runoff from the disturbed area of the Project site shall pass through a filter system before exiting the Project site.
  3. The Contractor shall provide temporary and permanent erosion and sedimentation control measures to prevent silt and sediment from entering the reals. The Contractor shall maintain an undisturbed vegetative buffer a minimum of 25 feet from the top of the bank. The Contractor will be provided a Land Disturbance Permit that allows encroachments on the 25 foot vegetative buffer in specific areas. The Contractor shall exercise extreme care during the land disturbance operations within the 25 foot vegetative buffer to prevent degradation of the stream.
  4. The Contractor shall limit land disturbance activity to those areas shown on the Drawings.
  5. The Contractor shall maintain the disturbed area on the entire site until acceptance of the Project at no additional cost to the Owner. Maintenance shall include mulching, re-seeding, clean-out of sediment barriers and sediment ponds, replacement of washed-out or undermined rip rap and erosion control materials, to the satisfaction of the PM/CM.
  6. All fines imposed for improper erosion and sedimentation control shall be paid by the Contractor.
- D. Temporary Erosion and Sedimentation Control: In general, temporary erosion and sedimentation control procedures shall be directed toward:
1. Preventing soil erosion at the source.
  2. Preventing silt and sediment from entering any waterway if soil erosion cannot be prevented.
  3. Preventing silt and sediment from migrating downstream in the event it cannot be prevented from entering the waterway.
- E. Permanent Erosion Control: Permanent erosion control measures shall be implemented to prevent sedimentation of the waterways and to prevent erosion of the Project site.

## **1.02 QUALITY ASSURANCE**

- A. General: Perform all work under this Section in accordance with all pertinent rules and regulations including, but not necessarily limited to, those stated herein and these Specifications.
- B. Conflicts: Where provisions of pertinent rules and regulations conflict with these Specifications, the more stringent provisions shall govern.

## **PART 2 PRODUCTS**

### **2.01 TEMPORARY EROSION AND SEDIMENTATION CONTROL MATERIALS**

- A. Silt Fence: Silt fence shall meet the requirements of Section 171 - Temporary Silt Fence of the Department of Transportation, State of Georgia, Standard Specification, latest edition. Silt fence fabric must be on the Georgia DOT Qualified Product List.
- B. Hay bales shall be clean, seed free cereal hay type.
- C. Netting shall be 1/2-inch, galvanized steel, chicken wire mesh.
- D. Filter stone shall be crushed stone conforming to Georgia Department of Transportation Table 800.01H, Size Number 3.

## **PART 3 EXECUTION**

### **3.01 GENERAL**

Standards: Provide all materials and promptly take all actions necessary to achieve effective erosion and sedimentation control in accordance with the Georgia Erosion and Sedimentation Act of 1975 as amended in 1989, local enforcing agency guidelines and these Specifications.

### **3.02 TEMPORARY EROSION AND SEDIMENTATION CONTROL**

- A. Temporary erosion and sedimentation control procedures should be initially directed toward preventing silt and sediment from entering the creeks. The preferred method is to provide an undisturbed natural buffer, extending a minimal 25 feet from the top of the bank, to filter the run-off. Should this buffer prove infeasible due to construction



activities being too close to the creek, or if the amount of sediment overwhelms the buffer, the Contractor shall place silt fences to filter the run-off and, if necessary, place permanent rip rap to stabilize the creek banks. When excavation activities disturb the previously stated preventative measures, or if they are not maintained, or whenever the construction activities cross the creeks, the check dams shall be installed downstream and within 200 feet of the affected area.

- B. Silt dams, silt fences, traps, barriers, check dams, appurtenances and other temporary measures and devices shall be installed as indicated on the approved plans and working drawings, shall be maintained until no longer needed, and shall then be removed. Deteriorated hay bales and dislodged filter stone shall be replaced with new materials.
- C. Where permanent grassing is not appropriate, and where the Contractor's temporary erosion and sedimentation control practices are inadequate, the PM/CM may direct the Contractor to provide temporary vegetative cover with fast growing seedings. Such temporary vegetative cover shall be provided by the Contractor in compliance with the Manual for Erosion and Sedimentation Control in Georgia, specifically in the selection of species, planting dates and application rates for seedings, fertilizer and mulching, with the exception that kudzu shall not be permitted.
- D. All erosion and sedimentation control devices, including check dams, shall be inspected by the Contractor at least daily and after each rainfall occurrence and cleaned out and repaired by the Contractor as necessary.
- E. Temporary erosion and sedimentation control devices shall be installed and maintained from the initial land disturbance activity until the satisfactory completion and establishment of permanent erosion control measures. At that time, temporary devices shall be removed.

### **3.03 PERMANENT EROSION CONTROL**

- A. Permanent erosion control shall include:
  - 1. Restoring the work site to its original contours, unless shown otherwise on the Drawings or directed by the PM/CM.
  - 2. Permanent vegetative cover shall be performed in accordance with Article 3.04 of this Section and Section 02933 of these Specifications.
  - 3. Permanent stabilization of steep slopes and creeks shall be performed in accordance with Article 3.05 of this Section.
- B. Permanent erosion control measures shall be implemented as soon as practical after the

completion of pipe installation or land disturbance for each segment of the Project. In no event shall implementation be postponed when no further construction activities will impact that portion or segment of the Project. Partial payment requests may be withheld for those portions of the Project not complying with this requirement.

### **3.04 GRASSING**

#### **A. General**

1. All references to grassing, unless noted otherwise, shall relate to establishing permanent vegetative cover.
2. When final grade has been established, all bare soil, unless otherwise required by the Contract Documents, shall be seeded, fertilized and mulched in an effort to restore to a protected condition. Critical areas shall be sodded as approved or directed by the PM/CM.
3. Specified permanent grassing shall be performed at the first appropriate season following establishment of final grading in each section of the site.
4. Permanent grassing shall be of a perennial species.

B. Replant grass removed or damaged in residential areas using the same variety of grass and at the first appropriate season. Where sod is removed or damaged, replant such areas using sod of the same species of grass at the first appropriate season. Outside of residential or landscaped areas, grass the entire area disturbed by the work on completion of work in any area. In all areas, promptly establish successful stands of grass.

C. Where permanent vegetative cover (grassing) cannot be immediately established (due to season or other circumstances) the Contractor shall provide temporary vegetative cover. The Contractor must return to the site (at the appropriate season) to install permanent vegetation in areas that have received temporary vegetative cover.

END OF SECTION

**SECTION 02225**  
**Trench Excavation and Backfill**

**PART 1 GENERAL**

**1.01 SCOPE**

- A. The work under this Section consists of furnishing all labor, equipment and materials and performing all operations in connection with the trench excavation and backfill required to install the pipelines shown on the Drawings and as specified.
- B. Excavation shall include the removal of any trees, stumps, brush, debris or other obstacles which remain after the clearing and grubbing operations, which may obstruct the work, and the excavation and removal of all earth, rock or other materials to the extent necessary to install the pipe and appurtenances in conformance with the lines and grades shown on the Drawings and as specified.
- C. Backfill shall include the refilling and compaction of the fill in the trenches and excavations up to the surrounding ground surface or road grade at crossing.
- D. The pipe zone area of the trench is divided into five specific areas:
  - 1. Foundation: The area beneath the bedding, sometimes also referenced to as trench stabilization.
  - 2. Bedding: The area above the trench bottom (or foundation) and below the bottom of the barrel of the pipe.
  - 3. Haunching: The area above the bottom of the barrel of the pipe up to a specified height above the bottom of the barrel of the pipe.
  - 4. Initial Backfill: The area above the haunching material and below a plane 18-inches above the top of the barrel of the pipe.
  - 5. Final Backfill: The area above a plane 18-inches above the top of the barrel of the pipe.
- E. The choice of method, means, techniques and equipment rests with the Contractor. The Contractor shall select the method and equipment for trench excavation and backfill depending upon the type of material to be excavated and backfilled, the depth of excavation, the amount of space available for operation of equipment, storage of excavated material, proximity of man-made improvements to be protected, available easement or right-of-way and prevailing practice in the area.

- F. The work under this Section shall adhere with Rockdale Water Resources Standards and Specifications.

## **1.02 QUALITY ASSURANCE**

- A. Density: All references to "maximum dry density" shall mean the maximum dry density defined by the "Maximum Density-Optimum Moisture Test", ASTM D 698. Determination of the density of foundation, bedding, haunching, or backfill materials in place shall meet with the requirements of ASTM D 1556, "Density of Soil In Place by the Sand Cone Method", ASTM D 2937, "Density of Soil In Place by the Drive-Cylinder Method" or ASTM D 2922, "Density of Soil and Soil-Aggregate In Place by Nuclear Methods (Shallow Depth)".
- B. Sources and Evaluation Testing: Testing of materials to certify conformance with the Specification requirements shall be performed by an independent testing laboratory at no cost to the Owner. The Contractor's testing laboratory shall perform tests, at no cost to the Owner, upon change of source and at sufficient intervals during the work to certify conformance of all select material furnished for use on this Project.

## **1.03 SAFETY**

Perform all trench excavation and backfilling activities in accordance with the Occupational Safety and Health Act of 1970 (PL 91-596), as amended. The Contractor shall pay particular attention to the Safety and Health Regulations Part 1926, Subpart P "Excavation, Trenching & Shoring" as described in OSHA publication 2226.

## **PART 2 PRODUCTS**

### **2.01 TRENCH FOUNDATION MATERIALS**

Crushed stone shall be utilized for trench foundation (trench stabilization) and shall meet the requirements of the Georgia Department of Transportation Specification 800.01, Group I (limestone, marble or dolomite) or Group II (quartzite, granite or gneiss). Stone size shall be between No. 57 and No. 4, inclusive.

### **2.02 BEDDING AND HAUNCHING MATERIALS**

- A. Unless specified otherwise, bedding and haunching materials shall be crushed stone as specified below.
- B. Crushed stone utilized for bedding and haunching shall meet the requirements of the Georgia Department of Transportation Specification 800.01, Group I (limestone,

marble or dolomite) or Group II (quartzite, granite or gneiss). Stone size shall be No. 57.

- C. Earth materials utilized for bedding and haunching shall be suitable materials selected from materials excavated from the trench. Suitable materials shall be clean and free of rock larger than 2-inches at its largest dimension, organics, cinders, stumps, limbs, frozen earth or mud, man-made wastes and other unsuitable materials. Should the material excavated from the trench be saturated, the saturated material may be used as earth material, provided it is allowed to dry properly and it is capable of meeting the specified compaction requirements. When necessary, earth bedding and haunching materials shall be moistened to facilitate compaction by tamping. If materials excavated from the trench are not suitable for use as bedding or haunching material, provide select material conforming to the requirements of this Section at no additional cost to the Owner.

### **2.03 INITIAL BACKFILL**

- A. Initial backfill material shall be crushed stone or earth materials as specified for bedding and haunching materials.
- B. Earth materials utilized for initial backfill shall be suitable materials selected from materials excavated from the trench. Suitable materials shall be clean and free of rock larger than 2-inches at its largest dimension, organics, cinders, stumps, limbs, frozen earth or mud, man-made wastes and other unsuitable materials. Should the material excavated from the trench be saturated, the saturated material may be used as earth material, provided it is allowed to dry properly and it is capable of meeting the specified compaction requirements. When necessary, initial backfill materials shall be moistened to facilitate compaction by tamping. If materials excavated from the trench are not suitable for use as initial backfill material, provide select material conforming to the requirements of this Section.

### **2.04 FINAL BACKFILL**

Final backfill material shall be general excavated earth materials, shall not contain more than one-third broken rock, of which no stone or boulder shall weigh more than 50 pounds, cinders, stumps, limbs, man-made wastes and other unsuitable materials. If materials excavated from the trench are not suitable for use as final backfill material, provide select material conforming to the requirements of this Section.

## **2.05 SELECT BACKFILL**

Select backfill shall be materials which meet the requirements as specified for bedding, haunching, initial backfill or final backfill materials, including compaction requirements.

## **2.06 CONCRETE**

Concrete for bedding, haunching, initial backfill or encasement shall have a compressive strength of not less than 3,000 psi, with not less than 5.5 bags of cement per cubic yard and a slump between 3 and 5-inches. Ready-mixed concrete shall be mixed and transported in accordance with ASTM C 94. Reinforcing steel shall conform to the requirements of ASTM A 615, Grade 60.

# **PART 3 EXECUTION**

## **3.01 TRENCH EXCAVATION**

- A. Topsoil and grass shall be stripped a minimum of 6-inches over the trench excavation site and stockpiled separately for replacement over the finished grading areas.
- B. Trenches shall be excavated to the lines and grades shown on the Drawings with the centerlines of the trenches on the centerlines of the pipes and to the dimensions which provide the proper support and protection of the pipe and other structures and accessories.
- C. Width
  - 1. The sides of all trenches shall be vertical to a minimum of one foot above the top of the pipe. Unless otherwise indicated on the Drawings, the maximum trench width shall be equal to the sum of the outside diameter of the pipe plus two feet. The minimum trench width shall be that which allows the proper consolidation of the haunching and initial backfill material.
  - 2. Excavate the top portion of the trench to any width within the construction easement or right-of-way which will not cause unnecessary damage to adjoining structures, roadways, pavement, utilities, trees or private property. Where necessary to accomplish this, provide sheeting and shoring.
  - 3. Where rock is encountered in trenches, excavate to remove boulders and stones to provide a minimum of 6-inches clearance between the rock and any part of the pipe or manhole.

4. Wherever the prescribed maximum trench width is exceeded, the Contractor shall use the next higher class (load factor) of bedding and haunching for the full trench width as actually cut, at no additional cost to the Owner. The excessive trench width may be due to unstable trench walls, inadequate or improperly placed bracing and sheeting which caused sloughing, accidental over-excavation, intentional over-excavation necessitated by the size of the Contractor's tamping and compaction equipment, intentional over-excavation due to the size of the Contractor's excavation equipment, or other reasons beyond the control of the PM/CM or Owner.

D. Depth

1. The trenches shall be excavated to the required depth or elevation which allow for the placement of the pipe and bedding to the thickness required by County standards.
2. Where rock is encountered in trenches, excavate to the minimum depth which will provide clearance below the pipe barrel of 8-inches for pipe 21-inches in diameter and smaller and 12-inches for larger pipe, valves and manholes. Remove boulders and stones to provide a minimum of 6-inches clearance between the rock and any part of the pipe, manhole or accessory.

E. Excavated Materials

1. Excavated materials shall be placed adjacent to the work to be used for backfilling as required. Topsoil shall be carefully separated and lastly placed in its original location.
2. Excavated material shall be placed sufficiently back from the edge of the excavation to prevent caving of the trench wall, to permit safe access along the trench and not cause any drainage problems. Excavated material shall be placed so as not to damage existing landscape features or man-made improvements.

**3.02 SHEETING, BRACING AND SHORING**

A. Sheeting, bracing and shoring shall be performed in the following instances:

1. Where sloping of the trench walls does not adequately protect persons within the trench from slides or cave-ins.
2. In caving ground.
3. In wet, saturated, flowing or otherwise unstable materials. The sides of all

trenches and excavations shall be adequately sheeted, braced and shored.

4. Where necessary to prevent damage to adjoining buildings, structures, roadways, pavement, utilities, trees or private properties which are required to remain.
  5. Where necessary to maintain the top of the trench within the available construction easement or right-of-way.
- B. In all cases, excavation protection shall strictly conform to the requirements of the Occupational Safety and Health Act of 1970, as amended.
- C. Timber: Timber for shoring, sheeting, or bracing shall be sound and free of large or loose knots and in good, serviceable condition. Size and spacing shall be in accordance with OSHA regulations.
- D. Steel Sheeting and Sheet Piling: Steel sheet piling shall be the continuous interlock type. The weight, depth and section modulus of the sheet piling shall be sufficient to restrain the loads of earth pressure and surcharge from existing foundations and live loads. Procedure for installation and bracing shall be so scheduled and coordinated with the removal of the earth that the ground under existing structures shall be protected against lateral movement at all times. The Contractor shall provide closure and sealing between sheet piling and existing facilities. Sheet piling within three feet of an existing structure or pipeline shall remain in place, unless otherwise directed by the PM/CM.
- E. Trench Shield: A trench shield or box may be used to support the trench walls. The use of a trench shield does not necessarily preclude the additional use of bracing and sheeting. When trench shields are used, care must be taken to avoid disturbing the alignment and grade of the pipe or disrupting the haunching of the pipe as the shield is moved. When the bottom of the trench shield extends below the top of the pipe, the trench shield will be raised in 6-inch increments with specified backfilling occurring simultaneously. At no time shall the trench shield be "dragged" with the bottom of the shield extending below the top of the pipe.
- F. Remove bracing and sheeting in units when backfill reaches the point necessary to protect the pipe and adjacent property. Leave sheeting in place when in the opinion of the PM/CM it cannot be safely removed. Cut off any sheeting left in place at least two feet below the surface.

### **3.03 ROCK EXCAVATION**

- A. Definition of Rock: Any material which cannot be excavated with conventional excavating equipment, and is removed by drilling and blasting, and occupies an original



volume of at least one-half cubic yard.

- B. **Blasting:** Provide licensed, experienced workmen to perform blasting. Conduct blasting operations in accordance with all existing ordinances and regulations. Protect all buildings and structures from the effects of the blast. Repair any resulting damage. If the Contractor repeatedly uses excessive blasting charges or blasts in an unsafe or improper manner, the PM/CM may direct the Contractor to employ an independent blasting consultant to supervise the preparation for each blast and approve the quantity of each charge.
- C. **Removal of Rock:** Dispose of rock off site that is surplus or not suitable for use as rip rap or backfill.
- D. The Contractor shall notify the PM/CM prior to any blasting. Additionally, the Contractor shall notify the PM/CM before any charge is set.
- E. Following review by the PM/CM regarding the proximity of permanent buildings and structures to the blasting site, the PM/CM may direct the Contractor to employ an independent, qualified specialty sub-contractor, approved by the PM/CM, to monitor the blasting by use of seismograph, identify the areas where light charges must be used, conduct pre-blast and post-blast inspections of structures, including photographs or videos, and maintain a detailed written log.

### **3.04 DEWATERING EXCAVATIONS**

- A. Dewater excavation continuously to maintain a water level two feet below the bottom of the trench.
- B. Control drainage in the vicinity of excavation so the ground surface is properly pitched to prevent water running into the excavation.
- C. There shall be sufficient pumping equipment, in good working order, available at all times, to remove any water that accumulates in excavations. Where the pipe line crosses natural drainage channels, the work shall be conducted in such a manner that unnecessary damage or delays in the prosecution of the work will be prevented. Provision shall be made for the satisfactory disposal of surface water to prevent damage to public or private property.
- D. In all cases, accumulated water in the trench shall be removed before placing bedding or haunching, laying pipe, placing concrete or backfilling.
- E. Where dewatering is performed by pumping the water from a sump, crushed stone shall be used as the medium for conducting the water to the sump. Sump depth shall be at

least two feet below the bottom of the trench, Pumping equipment shall be of sufficient quantity and/or capacity to maintain the water level in the sump two feet below the bottom of the trench. Pumps shall be a type such that intermittent flows can be discharged. A standby pump shall be required in the event the operating pump or pumps clog or otherwise stop operation.

- F. Dewater by use of a well point system when pumping from sumps does not lower the water level two feet below the trench bottom. Where soil conditions dictate, the Contractor shall construct well points cased in sand wicks. The casing, 6 to 10-inches in diameter, shall be jetted into the ground, followed by the installation of the well point, filling casing with sand and withdrawing the casing.

### **3.05 TRENCH FOUNDATION AND STABILIZATION**

- A. The bottom of the trench shall provide a foundation to support the pipe and its specified bedding. The trench bottom shall be graded to support the pipe and bedding uniformly throughout its length and width.
- B. If, after dewatering as specified above, the trench bottom is spongy, or if the trench bottom does not provide firm, stable footing and the material at the bottom of the trench will still not adequately support the pipe, the trench will be determined to be unsuitable and the Owner shall then authorize payment for trench stabilization.
- C. Should the undisturbed material encountered at the trench bottom constitute, in the opinion of the Owner, an unstable foundation for the pipe, the Contractor shall be required to remove such unstable material and fill the trench to the proper subgrade with crushed stone.
- D. Where the replacement of unsuitable material with crushed stone does not provide an adequate trench foundation, the trench bottom shall be excavated to a depth of at least two feet below the specified trench bottom. Place filter fabric in the bottom of the trench and support the fabric along the trench walls until the trench stabilization, bedding, haunching and pipe have been placed at the proper grade. The ends of the filter fabric shall be overlapped above the pipe.
- E. Where trench stabilization is provided, the trench stabilization material shall be compacted to at least 90 percent of the maximum dry density, unless shown or specified otherwise.

### **3.06 BEDDING AND HAUNCHING**

- A. Bedding material shall be placed to provide uniform support along the bottom of the pipe and to place and maintain the pipe at the proper elevation. The initial layer of

bedding placed to receive the pipe shall be brought to the grade and dimensions indicated on the Drawings, and the pipe shall be placed thereon and brought to grade by tamping the bedding material or by removal of the slight excess amount of the bedding material under the pipe. Adjustment to grade line shall be made by scraping away or filling with bedding material. Wedging or blocking up of pipe shall not be permitted. Applying pressure to the top of the pipe, such as with a backhoe bucket, to lower the pipe to the proper elevation or grade shall not be permitted. Each pipe section shall have a uniform bearing on the bedding for the length of the pipe, except immediately at the joint. All bedding shall extend the full width of the trench bottom. Prior to placement of bedding material, the trench bottom shall be free of any water, loose rocks, boulders or large dirt clods.

- B. At each joint, excavate bell holes of ample depth and width to permit the joint to be assembled properly and to relieve the pipe bell of any load.
- C. After the pipe section is properly placed, add the haunching material to the specified depth. The haunching material shall be shovel sliced, tamped, vigorously chinked or otherwise consolidated to provide uniform support for the pipe barrel and to fill completely the voids under the pipe, including the bell hole. Prior to placement of the haunching material, the bedding shall be clean and free of any water, loose rocks, boulders or dirt clods.
- D. Gravity Sewers and Accessories: Lay ductile iron pipe with Class "C" bedding, unless shown or specified otherwise. Lay PVC pipe with Class "B" bedding.
  - 1. Class "A" (Bedding Factor - 2.8): Excavate the bottom of the trench flat at a minimum depth as shown on the Drawings, below the bottom of the pipe barrel. Lay pipe to line and grade on concrete block. Place concrete to the full width of the trench and to a height of one-fourth of the outside diameter of the pipe above the invert.
  - 2. Class "B" (Bedding Factor - 1.9): Excavate the bottom of the trench flat at a minimum depth as shown on the Drawings, below the bottom of the pipe barrel. Place and compact bedding material to the proper grade. Haunching material shall then be carefully placed by hand and compacted to provide full support under and up to the centerline of the pipe.
  - 3. Class "C" (Bedding Factor - 1.5): Excavate the bottom of the trench flat at a minimum depth as shown on the Drawings, below the bottom of the pipe barrel. Place and compact bedding material to the proper grade. Haunching material shall then be carefully placed by hand and compacted to provide full support under and up to a height of one-fourth the outside diameter of the pipe above the bottom of the pipe barrel.

- E. Manholes: Excavate to a minimum of 12-inches below the planned elevation of the base of the manhole. Place and compact crushed stone bedding material to the required grade before constructing the manhole.
- F. Excessive Width and Depth
  - 1. Gravity Sewers: If the trench is excavated to excess width, provide the bedding class with the next higher bedding factor. Crushed stone haunching and initial backfill may be used in lieu of Class "A" bedding, where Class "A" bedding is necessitated by excessive trench width.
  - 2. If the trench is excavated to excessive depth, provide crushed stone to place the bedding at the proper elevation or grade.
- F. Compaction: Bedding and haunching materials under pipe, manholes and accessories shall be compacted to a minimum of 90 percent of the maximum dry density, unless shown or specified otherwise.

### **3.07 INITIAL BACKFILL**

- A. Initial backfill shall be placed to anchor the pipe, protect the pipe from damage by subsequent backfill and ensure the uniform distribution of the loads over the top of the pipe.
- B. Place initial backfill material carefully around the pipe in uniform layers to a depth of at least 18-inches above the pipe barrel. Layer depths shall be a maximum of 6-inches for pipe 18-inches in diameter and smaller and a maximum of 12-inches for pipe larger than 18-inches in diameter.
- C. Backfill on both sides of the pipe simultaneously to prevent side pressures.
- D. Compact each layer thoroughly with suitable hand tools or tamping equipment.
- E. Initial backfill shall be compacted to a minimum 90 percent of the maximum dry density, unless shown or specified otherwise.
- F. If materials excavated from the trench are not suitable for use as backfill materials, provide select backfill material conforming to the requirements of this Section.

### **3.08 CONCRETE ENCASEMENT**

Where concrete encasement is specified by the County, excavate the trench to provide a

minimum of 6-inches clearance from the bell of the pipe. Lay the pipe to line and grade on concrete blocks. In lieu of bedding, haunching and initial backfill, place concrete to the full width of the trench and to a height of not less than 6-inches above the pipe bell. Do not backfill the trench for a period of at least 24 hours after concrete is placed.

### **3.09 FINAL BACKFILL**

- A. Backfill carefully to restore the ground surface to its original condition.
- B. The top 6-inches shall be topsoil obtained as specified in Article 3.01 of this Section.
- C. Excavated material which is unsuitable for backfilling, and excess material, shall be disposed of, at no additional cost to the Owner. Surplus soil shall be removed from the site. The site shall be graded to match the pre-construction contours unless specifically directed otherwise by the PM/CM. Surplus rock from the trenching operations shall be removed from the site.
- D. If materials excavated from the trench are not suitable for use as backfill materials, provide select backfill material conforming to the requirements of this Section.
- E. After initial backfill material has been placed and compacted, backfill with final backfill material. Place backfill material in uniform layers, compacting each layer thoroughly as follows:
  - 1. In 6-inch layers, if using light power tamping equipment, such as a "jumping jack".
  - 2. In 12-inch layers, if using heavy tamping equipment, such as hammer with tamping feet.
  - 3. In 24-inch layers, if using a hydra-hammer.
- F. Settlement: If trench settles, re-fill and grade the surface to conform to the adjacent surfaces.
- G. Final backfill shall be compacted to a minimum 90 percent of the maximum dry density, unless specified otherwise.

### **3.10 BACKFILL UNDER ROADS**

Compact backfill underlying pavement and sidewalks, and backfill under dirt and gravel roads to a minimum 95 percent of the maximum dry density. The top 12-inches

shall be compacted to a minimum of 98 percent of the maximum dry density.

### **3.11 TESTING AND INSPECTION**

- A. The soil testing will be performed by an independent testing laboratory selected by the Owner. Payment for soil testing shall be made by the Contractor.
- B. The soils testing laboratory is responsible for the following:
  - 1. Compaction tests in accordance with Article 1.02 of this Section.
  - 2. Field density tests for each two feet of lift, one test for each 500 feet of pipe installed or more frequently if ordered by the PM/CM.
  - 3. Inspecting and testing stripped site, subgrades and proposed fill materials.
- C. The Contractor's duties relative to testing include:
  - 1. Notifying laboratory of conditions requiring testing.
  - 2. Coordinating with laboratory for field testing.
  - 3. Paying costs for additional testing performed beyond the scope of that required and for re-testing where initial tests reveal non-conformance with specified requirements.
  - 4. Providing excavation as necessary for laboratory personnel to conduct tests.
- D. Inspection
  - 1. Earthwork operations, acceptability of excavated materials for bedding or backfill, and placing and compaction of bedding and backfill is subject to inspection by the Owner.
  - 2. Foundations and shallow spread footing foundations are required to be inspected by a geotechnical engineer, who shall verify suitable bearing and construction.
- E. Comply with applicable codes, ordinances, rules, regulations and laws of local, municipal, state or federal authorities having jurisdiction.

END OF SECTION

**SECTION 02575**  
**Removing and Replacing Pavement**

**PART 1 GENERAL**

**1.01 SCOPE**

The work to be performed under this Section shall consist of removing and replacing existing pavement, sidewalks and curbs in paved areas where such have been removed for construction of sewers, manholes and all other sewer appurtenances and structures. All work shall comply with Rockdale Water Resources Standards and Specifications.

**1.02 SUBMITTALS**

- A. Provide certificates stating that materials supplied comply with Specifications. Certificates shall be signed by the asphalt producer and the Contractor.
- B. Traffic paint manufacturer's application instructions and a description and other data relative to the Contractor's application equipment and methods shall be submitted to the PM/CM for approval.

**1.03 CONDITIONS**

- A. Weather Limitations
  - 1. Apply bituminous prime and tack coats only when the ambient temperature in the shade has been at least 50 degrees F for 12 hours immediately prior to application.
  - 2. Do not conduct paving operations when surface is wet or contains excess of moisture which would prevent uniform distribution and required penetration.
  - 3. Construct asphaltic courses only when atmospheric temperature in the shade is above 40 degrees F, when the underlying base is dry and when weather is not rainy.
  - 4. Place base course when air temperature is above 35 degrees F and rising.
- B. Grade Control: Establish and maintain the required lines and grades for each course during construction operations.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS AND CONSTRUCTION**

- A. Graded Aggregate Base Course: Graded aggregate base course shall be of uniform quality throughout and shall meet the requirements of Section 815.01 of the Georgia Department of Transportation Standard Specifications.
- B. Black Base: Black base course shall be of uniform quality throughout and shall conform to the requirements of Section 828 of the Georgia Department of Transportation Standard Specifications.
- C. Binder Course: The binder course of all paved roadways shall conform to the requirements of Section 400, Type "B" of the Georgia Department of Transportation Standard Specifications.
- D. Surface Course: The surface course for all pavement, including prime or tack coat when required by the PM/CM, shall conform to the requirements of Section 400, Type "F" of the Georgia Department of Transportation Standard Specifications.
- E. Concrete: Provide concrete and reinforcing for concrete pavement or base courses in accordance with the requirements of the Georgia Department of Transportation Standard Specifications, Section 430. Concrete shall be of the strength classifications shown in Section 02730 of these Specifications.
- F. Special Surfaces: Where driveways or roadways are disturbed or damaged which are constructed of specialty type surfaces, e.g., brick, stone, or decorative sidewalks, these driveways and sidewalks shall be restored utilizing similar, if not original, materials. A specialty contractor shall be used to restore the surfaces to their previous or better condition. Special surfaces shall be removed and replaced to the limits to which they were disturbed.

### **2.02 TYPES OF PAVEMENTS**

- A. General: All existing pavement removed, destroyed or damaged by construction shall be replaced with the same type and thickness of pavement as that existing prior to construction, unless otherwise directed by the PM/CM. Materials, equipment and construction methods used for paving work shall conform to the Georgia Department of Transportation specifications applicable to the particular type required for replacement, repair or new pavements.
- B. Aggregate Base: Aggregate base shall be constructed in accordance with the



requirements of Section 310 of the Georgia Department of Transportation Standard Specifications. The maximum thickness to be laid in a single course shall be 6-inches compacted. If the design thickness of the base is more than 6-inches, it shall be constructed in two or more courses of approximate equal thickness. After the material placed has been shaped to line, grade and cross-section, it shall be rolled until the course has been uniformly compacted to at least 100 percent of the maximum dry density when Group 2 aggregate is used, or to at least 98 percent of maximum dry density when Group 1 aggregate is used.

- C. Concrete Pavement: Concrete pavement or base courses shall be replaced with concrete. The surface finish of the replaced concrete pavement shall conform to that of the existing pavement. The surface of the replaced concrete base course shall be left rough. The slab depth shall be equivalent to the existing concrete pavement or base course, but in no case less than 6-inches thick. Transverse and longitudinal joints removed from concrete pavement shall be replaced at the same locations and to the same types and dimensions as those removed. Concrete pavements or concrete base courses shall be reinforced.
- D. Asphaltic Concrete Base, Binder and Surface Course: Asphaltic concrete base, binder and surface course construction shall conform to Georgia Department of Transportation Standard Specifications, Section 400. The pavement mixture shall not be spread until the designated surface has been previously cleaned and prepared, is intact, firm, properly cured, dry and the tack coat has been applied. Apply and compact the base in maximum layer thickness by asphalt spreader equipment of design and operation approved by the PM/CM. After compaction, the black base shall be smooth and true to established profiles and sections. Apply and compact binder and the surface course in a manner approved by the PM/CM. Immediately correct any high, low or defective areas by cutting out the course, replacing with fresh hot mix, and immediately compacting to conform and thoroughly bond to the surrounding area.
- E. Surface Treatment Pavement: Bituminous penetration surface treatment pavement shall be replaced with a minimum thickness of 1-inch conforming to Section 424, Georgia Department of Transportation Standard Specifications.
- F. Temporary Measures: During the time period between pavement removal and complete replacement of permanent pavement, maintain highways, streets and roadways by the use of steel running plates anchored to prevent movement. The backfill above the pipe shall be compacted, as specified in Section 02225 of these Specifications, up to the existing pavement surface to provide support for the steel running plates. All pavement shall be replaced within seven calendar days of its removal.

### **PART 3 EXECUTION**

### **3.01 REMOVING PAVEMENT**

- A. General: Remove existing pavement as necessary for installing the pipe line and appurtenances.
- B. Marking: Before removing any pavement, mark the pavement neatly paralleling pipe lines and existing street lines. Space the marks the width of the trench.
- C. Breaking: Break asphalt pavement along the marks using pavement shearing equipment, jack hammers or other suitable tools. Break concrete pavement along the marks by scoring with a rotary saw and breaking below the score by the use of jack hammers or other suitable tools.
- D. Machine Pulling: Do not pull pavement with machines until the pavement is completely broken and separated from pavement to remain.
- E. Damage to Adjacent Pavement: Do not disturb or damage the adjacent pavement. If the adjacent pavement is disturbed or damaged, remove and replace the damaged pavement.
- F. Sidewalk: Remove and replace any sidewalks disturbed by construction for their full width and to the nearest undisturbed joint.
- G. Curbs: Tunnel under or remove and replace any curb disturbed by construction to the nearest undisturbed joint.

### **3.02 REPLACING PAVEMENT**

- A. Preparation of Subgrade: Upon completion of backfilling and compaction of the backfill, arrange to have the compaction tested by an independent testing laboratory selected by the Owner. After compaction testing has been satisfactorily completed, replace all pavements, sidewalks and curbs removed.
  - 1. The existing street pavement or surface shall be removed along the lines of the work for the allowable width specified for the trench or structure. After the installation of the sewerage or water works facilities and after the backfill has been compacted suitably, the additional width of pavement to be removed, as shown on the Drawings, shall be done immediately prior to replacing the pavement.
  - 2. Trench backfill shall be compacted for the full depth of the trench as specified in Section 02225 of these Specifications.

3. Temporary trench backfill along streets and driveways shall include 6-inches of crushed stone or cherty clay as a temporary surfacing of the trenches. This temporary surface shall be maintained carefully at grade and dust-free by the Contractor until the backfill of the trench has thoroughly compacted in the opinion of the Owner and permission is granted to replace the street pavement.
4. When temporary crushed stone or chert surface is considered by the Owner to be sufficient surface for gravel pavement, the surface shall be graded smooth and to an elevation that will make the final permanent surfacing level with the adjacent surfacing that was undisturbed.

B. Pavement Replacement

1. Prior to replacing pavement, make a final cut in concrete pavement 12-inches back from the edge of the damaged pavement with a concrete saw. Remove asphalt pavement 12-inches back from the edge of the damaged pavement using pavement shearing equipment, jack hammers or other suitable tools.
2. Replace all street and roadway pavement as specified by the County. Replace driveways, sidewalks and curbs with the same material, to nearest existing undisturbed construction joint and to the same dimensions as those existing.
3. If the temporary crushed stone or chert surface is to be replaced, the top 6-inches shall be removed and the crushed stone surfacing for unpaved streets or the base for the bituminous surface shall be placed.
4. Following this preparation, the chert or crushed stone base shall be primed with a suitable bituminous material and surfaced with the proper type of bituminous surface treatment.
5. Where the paved surface is to be replaced with asphaltic concrete pavement, concrete pavement or with a concrete base and a surface course, the temporary chert or crushed stone surface and any necessary backfill material, additional existing paving and new excavation shall be removed to the depth and width as specified by the County. All edges of the existing pavement shall be cut to a straight, vertical edge. Care shall be used to get a smooth joint between the old and new pavement and to produce an even surface on the completed street. Expansion joints, where applicable, shall be replaced in a manner equal to the original joint.
6. Where driveways or roadways, constructed of specialty type surfaces, e.g., brick, stone or decorated sidewalks are disturbed or damaged, these driveways,

roadways or sidewalks shall be restored utilizing similar materials. A specialty contractor shall be used to restore the surfaces to their previous or better condition. Special surfaces shall be removed and replaced to the limits to which they were disturbed.

- D. Pavement Striping: Pavement striping removed or paved over shall be replaced with the same type, dimension and material as original unless directed otherwise by the PM/CM.

### **3.03 SIDEWALK AND CURB REPLACEMENT**

#### **A. Construction**

1. All concrete sidewalks and curbs shall be replaced with concrete.
2. Preformed joints shall be 1/2-inch thick, conforming to the latest edition of AASHTO M59 for sidewalks and AASHTO M 123 for curbs.
3. Forms for sidewalks shall be of wood or metal, shall be straight and free from warp, and shall be of sufficient strength, when in place, to hold the concrete true to line and grade without springing or distorting.
4. Forms for curbs shall be metal and of an approved section. They shall be straight and free from distortions, showing no vertical variation greater than 1/8-inch in 10 feet and no lateral variation greater than 1/4-inch in 10 feet from the true plain surface on the vertical face of the form. Forms shall be of the full depth of the structure and constructed such to permit the inside forms to be securely fastened to the outside forms.
5. Securely hold forms in place true to the lines and grades.
6. Wood forms may be used on sharp turns and for special sections, as approved by the Owner. Where wooden forms are used, they shall be free from warp and shall be the nominal depth of the structure.
7. All mortar and dirt shall be removed from forms and all forms shall be thoroughly oiled or wetted before any concrete is deposited.

- B. When a section is removed, the existing sidewalk or curb shall be cut to a neat line, perpendicular to both the centerline and the surface of the concrete slab. Existing concrete shall be cut along the nearest existing construction joints.

- C. Existing concrete sidewalks and curbs that have been cut and removed for construction

purposes shall be replaced with the same width and surface as the portion removed. Sidewalks shall have a minimum uniform thickness of 4-inches. The new work shall be neatly jointed to the existing concrete so that the surface of the new work shall form an even, unbroken plane with the existing surfaces.

- D. The subgrade shall be formed by excavating to a depth equal to the thickness of the concrete, plus 2-inches. Subgrade shall be of such width as to permit the proper installation and bracing of the forms. Subgrades shall be compacted by hand tamping or rolling. Soft, yielding or unstable material shall be removed and backfilled with satisfactory material. Place 2-inches of porous crushed stone under all sidewalks and curbs and compacted thoroughly, then finish to a smooth, unyielding surface at proper line, grade and cross section.
- E. Joint for Curbs
1. Joints shall be constructed as indicated as specified. Construct joints true to line with their faces perpendicular to the surface of the structure and within 1/4-inch of their designated position.
  2. Thoroughly spade and compact the concrete at the faces of all joints filling all voids.
  3. Install expansion joint materials at the point of curve at all street returns. Install expansion joint material behind the curb at abutment to sidewalks and adjacent structures.
  4. Place contraction joints every 10 feet along the length of the curbs and gutters. Form contraction joints using steel templates or division plates which conform to the cross section of the structure. Leave the templates in place until the concrete has set sufficiently to hold its shape, but remove them while the forms are still in place. Contraction joint templates or plates shall not extend below the top of the steel reinforcement or they shall be notched to permit the reinforcement to be continuous through the joint. Contraction joints shall be a minimum of 1-1/2-inches deep.
- F. Expansion joints shall be required to replace any removed expansion joints or in new construction as specified by the County. Expansion joints shall be true and even, shall present a satisfactory appearance, and shall extend to within 1/2-inch of the top of finished concrete surface.
- G. Finishing
1. Strike off the surface with a template and finish the surface with a wood float

using heavy pressure, after which, contraction joints shall be made and the surface finished with a wood float or steel trowel.

2. Finish the face of the curbs at the top and bottom with an approved finishing tool.
3. Finish edges with an approved finishing tool having a 1/4-inch radius.
4. Provide a final broom finish by lightly combing with a stiff broom after troweling is complete.
5. The finished surface shall not vary more than 1/8-inch in 10 feet from the established grade.

H. Driveway and Sidewalk Ramp Openings

1. Provide driveway openings of the widths and at the locations indicated on the Drawings and as directed by the Owner.
2. Provide sidewalk ramp openings as indicated on the Drawings, in conformance with the applicable regulations and as directed by the Owner.

- I. Concrete shall be suitably protected from freezing and excessive heat. It shall be kept covered with burlap or other suitable material and kept wet until cured. Provide necessary barricades to protect the work. All damage caused by people, vehicles, animals, rain, the Contractor's operations and the like shall be repaired by the Contractor, at no additional expense to the Owner.

**3.04 MAINTENANCE**

The Contractor shall maintain the surfaces of roadways built and pavements replaced until the acceptance of the Project. Maintenance shall include replacement, scraping, reshaping, wetting and rerolling as necessary to prevent raveling of the road material, the preservation of reasonably smooth surfaces and the repair of damaged or unsatisfactory surfaces, to the satisfaction of the PM/CM. Maintenance shall include sprinkling as may be necessary to abate dust from the gravel surfaces.

**3.05 SUPERVISION AND APPROVAL**

- A. Pavement restoration shall meet the requirements of the regulatory agency responsible for the pavement. Obtain agency approval of pavement restorations before requesting final payment.
- B. Obtain the PM/CM's approval of restoration of pavement, such as private roads and

drives, that are not the responsibility of a regulatory agency.

- C. Complete pavement restoration as soon as possible after backfilling.
- D. Failure of Pavement: Should any pavement restoration or repairs fail or settle during the life of the Contract, including the bonded period, promptly restore or repair defects.

**3.06 CLEANING**

The Contractor shall remove all surplus excavation materials and debris from the street surfaces and rights-of-way and shall restore street, roadway or sidewalk surfacing to its original condition.

END OF SECTION

**SECTION 02720  
MANHOLE FRAME SEALING**

1.01 GENERAL

A. Work this section

1. This section deals with the installation of internal and external frame seals manholes.

B. References

1. Codes, Specifications, and Standards: (None Cited)
2. American Standard for Testing and Materials (ASTM)
3. Specifications for Construction of Sewer Mains, Rockdale County Department of Water Resources
4. General Conditions for Rockdale County Construction Contracts, Rockdale County
5. Rockdale County Department of Water Resources, Information Applicable to Infiltration/Inflow Projects

C. Definitions (NONE CITED)

D. Requirements

1. The work of this section is to provide a seal between the manhole cover frame and manhole corbel, including any frame leveling rings. This system shall be applied where the existing frame leveling ring(s) is (are) serviceable. The work includes surface preparation, sealing, and testing.

E. Submittals

1. The Contractor shall submit shop drawings and samples, 30 calendar days before beginning manhole frame sealing, for any material proposed as equivalent or approved alternate to a specified material. Contractor shall submit sufficient manufacturer information to support equivalency or suitability to the satisfaction of the County.
2. The Contractor shall submit manufacturer's Certificate of Compliance certifying compliance with the applicable specifications and standards.



3. The Contractor shall submit certified copies of test reports of factory tests required by the applicable standards and this Section.
4. The Contractor shall submit Manufacturer's installation instructions and procedures and insertion runs.
5. The Contractor shall submit procedures and materials for manhole frame sealing.

F. Delivery, storage, and HANDLING

1. The Contractor shall be responsible for delivery, storage, and handling of products.
2. Products shall be kept safe from damage. Damage products shall be removed from the job site promptly. Damaged products shall be replaced with undamaged products at no additional cost the County.

G. Measurement and payment

1. Payment for internal frame sealing – rubber sleeve shall be made at the unit price bid. Payment will be full compensation for furnishing all materials, labor, tools, flow control and equipment necessary to perform all work. Payment shall be made under Manhole Adjustment – Unpaved Area, Internal Frame Sealing – Rubber Sleeve, per each.
2. Payment for internal frame sealing – flexible sealant shall be made at the unit price bid. Payment will be full compensation for furnishing all materials, labor, tools, flow control and equipment necessary to perform all work. Payment shall be made under Manhole Adjustment – Unpaved Area, Internal Frame Sealing – Flexible Sealant, per each.
3. Payment for Manhole Frame Seal Dye Test shall be made at the unit price bid. Payment will be full compensation for furnishing all labor, materials, supplies, transportation, traffic control and equipment, etc. necessary to perform all work. Payment shall be made under Manhole Rehabilitation, Manhole Frame Seal Dye Test, per each.
4. Separate payment will not be made for asset management. The cost of asset management must be included in other unit cost.

## 1.02 - PRODUCTS

### A. RUBBER SLEEVE AND EXTENSION

1. Manhole Frame Sealing material shall be manufactured by Cretex Specialty Products or County approved equal.
2. The flexible rubber sleeve, extensions and wedge strips shall be extruded or molded from a high grade rubber compound conforming to the applicable requirements of ASTM C-923, with a minimum of 1500 psi tensile strength, maximum 18 percent compression set and a hardness (durometer) of 48+/-5.
3. The sleeve shall either double or triple pleated with a minimum unexpanded vertical height of 8 inches and 10 inches respectively and a minimum thickness of 3/16 inches. The top and bottom section of the sleeve shall contain an integrally formed expansion band recess and multiple sealing fins.
4. The top section of the extension shall have a minimum thickness of 3/32 inches and shall be shaped to fit into the bottom band recess of the sleeve under the bottom chimney seal band and the remainder of the extension shall have a minimum thickness of 3/16 inches. The bottom section of the extension shall contain an integrally formed expansion band recess and multiple sealing fins matching that of the rubber sleeve.
5. Any splice used to fabricate the sleeve and extension shall be hot vulcanized and have strength such that the sleeve shall withstand a 180-degree bend with no visible separation.
6. The continuous wedge strip used to adapt the rubber sleeve to sloping surfaces shall have the slope differential needed to provide a vertical band recess surface, be shaped to fit into the band recess and have an integral band restraint. The length of the wedge strip shall be such that, when its ends are butted together, it will cover the entire inside circumference of that band recess needing slope adjustment.

### B. Expansion bands

1. The expansion bands used to compress the sleeve against the manhole shall be integrally formed from 16-gauge stainless steel conforming to ASTM A-240, Type 304, with no welded attachments and shall have minimum width of 1-3/4 inches.
2. The bands shall have a minimum adjustment range of 2 diameter inches and the mechanism used to expand the band shall have the capacity to develop the pressures necessary to make a watertight seal. The band shall be permanently held in this

expanded position with a positive locking mechanism, any studs and nuts used for this mechanism shall be stainless steel conforming to ASTM F-923 and 594, Type 304.

C. Base coat material

1. Product shall be designed to fill voids and uneven surfaces of existing transition areas between the manhole frame and the corbel area.
2. The base coating material shall be a high strength, quickset cement mortar. The product shall be QM-1S Restore by Quadex, Inc., Mainstay ML-72 by Madewell Products, or approved alternate.

D. Flexible sealant

1. Internal frame seal shall be a two-part flexible sealant. The applied sealant system shall be resistant to freezing and to movement caused by settling, freeze-thaw cycles and vehicular traffic. Sealant shall be Flex-Seal Utility Sealant manufactured by Sealing Systems, Inc., or Madewell 806M by Madewell Products.

### 1.03 - EXECUTION

A. General

1. Only new materials shall be used.
2. Materials shall be stored in accordance with manufacturer's recommendations

B. Application

1. All work shall be performed in accordance with manufacturers recommended procedures for the approved product(s). Contractor shall request any variances from manufacturer's procedures concurrently with submitting product for approval.
2. Prepare surfaces in accordance with manufacturer's recommendations. Obtain a clean, dry structurally sound surface before proceeding with subsequent sealing activities.
3. Profile existing surface with an application of base coating material. Apply with trowel to create a uniform surface to accept the application of the flexible sealant. Do not apply to casting. Apply to upper three inches of corbel.
4. Mix and apply flexible sealant to entire primed, profiled chimney surface. Extend to lower 3 inches of frame. Follow manufacturer's recommendations for base material

curing time prior to flexible sealant application. Minimum coating thickness shall be 100 mils.

5. Remove any debris accumulated during the coating process, paying particular attention to pipes and troughs.

#### C. Preparation

1. All manhole frames that are misaligned from the chimney or cone/corbel by 3 inches or more shall be excavated and realigned. All existing frames shall be thoroughly cleaned before reinstallation.
2. All loose and protruding mortar and brick that would interfere with the seal's performance shall be removed and the appropriate areas of the manhole frame, chimney and or cone/corbel cleaned by wire brushing. All sealing surfaces shall be reasonably smooth and circular, clean and free of any loose material or excessive voids.
3. Detail surface preparation, including providing a vertical surface on a cone when none exists, shall be in accordance with the frame seal manufacturer's instructions.

#### D. Installation

1. All activities shall be performed in accordance with the manufacturer's recommendations and regulations established by OSHA. Particular attention shall be drawn to those safety requirements involving working with scaffolding and entering confined spaces.
2. The Contractor shall install the manhole frame seal in accordance with the manufacturer's instructions.
3. The Contractor shall field measure the manhole to determine the information required on the manufacturer's "Sizing and Ordering" procedure. This information is needed to obtain the proper size of bands, the size and shape of the rubber sleeve and the need for and size of any extensions.
4. The Contractor shall be properly trained in the installation of frame seals by the manufacturer and shall have a manufacturer's recommended expansion tool and all other equipment/tools necessary to install the frame seals.

#### E. Inspection

1. Manhole frame seals shall be visually inspected after installation to insure that the seal is properly positioned, tight against the manhole and frame surfaces, that no voids or leakage points exist and that the bands are securely locked in place. Any

seals failing this test shall be reworked as necessary and retested at no additional cost to the County.

2. The Contractor shall complete work on each asset as assigned via the County's Computerized Work Order Management system. Upon start of work, the Contractor shall receive work orders as assigned by the Project Manager. The Contractor shall utilize the Mobile Work Manager to maintain and synchronize the status of each rehabilitation work order issued.
3. The Contractor shall be responsible for providing all computer hardware necessary to use GBA Mobile Master.
4. The Contractor shall be responsible for acquiring the appropriate version license of GBA Mobile Master.

F. Frame seal Testing

1. Any seals not passing this visual inspection may, at the Contractor expense, be tested for leakage using a method approved by the County.
2. After all improvements to a manhole have been completed and manufacturers recommended curing times have lapsed, Contractor shall dye test the manhole frame seal in the presence of the County. The dye test shall consist of applying concentrated sewer dye solution up to the top elevation of the manhole frame for a minimum of ten minutes. Frame seal leaks shall be repaired and retested at no additional cost to the County

G. DOCUMENTATION

1. The Contractor shall complete work on each asset as assigned via the County's Computerized Work Order Management system. Upon start of work, the Contractor shall receive work orders as assigned by the Project Manager. The Contractor shall utilize the Mobile Work Manager to maintain and synchronize the status of each rehabilitation work order issued.

H. Warranty

1. The Contractor shall guarantee his work for a warranty period of one (1) year from the date of final acceptance. If, at anytime during the warranty period, any leakage, cracking, loss of bond, or other discontinuity is identified, the Contractor shall make repairs at no additional cost to the County.

END OF SECTION

**SECTION 02726**

**SERVICE LATERAL RECONNECTION AND REPLACEMENT**

**1.01** GENERAL - WORK THIS SECTION

- A. Work this section includes the reconnection of exiting service laterals to the sewer main and the replacement of sewer laterals.

**1.02** References

- A. Codes, Specifications, and Standards (None Cited)
- B. Testing and Materials Standards
  - ASTM D-1784
  - ASTM D-3034
  - ASTM D-3212
  - ANSI A-2.1.
  - ASTM A-746
- C. Specifications for Construction of Sewer Mains, Rockdale County Department of Public Utilities
- D. General Conditions for Rockdale County Construction Contracts, Rockdale County
- E. Related sections of the Sewer System Rehabilitation Specifications
  - Section 02741, Sanitary Sewer Cleaning

Definitions – (NONE CITED)

**1.03** Experience

- A. Supervisor of the field crews performing these functions shall have the proper training in these types of equipment and activities and have a minimum of five (5) years experience in performing such assignments including safe work practices, etc.
- B. Field crew leaders performing these functions shall have the proper training in these types of equipment and activities and have a minimum of three (3) years experience in performing such assignments including safe working practices, etc.
- C. The Contractor shall provide the County with written documentation (certification) that the supervisor, field crew leader and all crewmembers responsible for these assignments have the proper training and the requisite experience.
- D. No crewmembers shall enter confined spaces without the necessary certified training and at least one-year experience.

#### 1.04 MEASUREMENT AND PAYMENT

- A. Payment for service lateral replacement shall be made at the unit bid price. A service lateral replacement will be made by the excavation, removal of the existing service lateral, in its entirety, pipe bedding, backfill, and surface restoration from the sewer main up to the ROW line or easement line, which ever applies, and replacement with PVC pipe (or other material acceptable to the county), all fittings and the connections to the sewer main and sewer service from the house/building/etc. Payment will be full compensation for furnishing all materials, labor, tools, traffic control, and equipment necessary to perform all work. Payment for the service lateral replacement shall be made under Service Laterals, Service Lateral Replacement, Sewer Main Size, Depth of Cut, per linear foot.
- B. Payment for service lateral replacements made with DIP in-lieu-of PVC shall be made at the unit bid price and shall include all pipe and fittings. Payment will be full compensation for furnishing all materials, labor, tools, traffic control, and equipment necessary to perform all work. Payment for service lateral replacement made with DIP in-lieu-of PVC shall be made under Service Laterals, Service Lateral Replacement, 4-inch to 6-inch DIP as an extra, per linear foot. This payment will be in addition to the payments for the service lateral replacement with PVC.
- C. Payment for a PVC clean-out installation (excavation) for a service lateral rehabilitation shall be made at the unit price. Payment will be full compensation for furnishing all materials, labor, tools, traffic control, and equipment necessary to perform all work. Payment for PVC clean-out installation shall be made under Service Lateral Rehabilitation, PVC Cleanout Installation, Traditional Excavation, per each.
- D. Payment for a PVC clean-out installation (Trenchless or Vacuum) for a service lateral rehabilitation shall be made at the unit price. Payment will be full compensation for furnishing all materials, labor, tools, traffic control, and equipment necessary to perform all work. Payment for PVC clean-out installation shall be made under, Service Lateral Rehabilitation, PVC Cleanout Installation, Trenchless or Vacuum, per each.
- E. Payment for service lateral reconnection shall be made at the unit bid price. A service lateral reconnection will be made by the removal of the existing service connection from the sewer main up to the first service lateral fitting or 5-feet, whichever occurs first, and replacement with new PVC pipe, new fittings and new service connection to the sewer main. Payment will be full compensation for furnishing all materials, labor, tools, traffic control, and equipment necessary to perform all work. Payment for the service lateral reconnection shall be made under Service Laterals, Service Lateral Reconnection, Sewer Main Size, Depth of Cut, per each.
- F. Payment for service lateral reconnection made with DIP in-lieu-of PVC shall be made at the unit bid price and shall include all pipe and fittings. Payment will be full compensation for furnishing all materials, labor, tools, traffic control, and equipment necessary to perform all work. Payment for service lateral reconnection made with DIP in-lieu-of PVC shall be made under Service Laterals, service Lateral Reconnection, 4-inch to 6-inch DIP as an extra, per linear foot. This payment will be in addition to the payments for the service lateral reconnection with PVC.

**1.05** Pipe and fittings

- A. All materials shall be pre-approved by the County.
- B. The Contractor shall use PVC (minimum SDR 35) pipe, or class 50 ductile iron pipe for 4-inch and 6-inch service laterals.
- C. PVC pipe shall be gasket jointed conforming to ASTM D-3212.
- D. For reconnection of existing services, the Contractor shall select service connection pipe diameter to match existing service diameter.
- E. The Contractor shall connect service laterals to the sewer mains with prefabricated sewer wye conforming to specifications for the sewer main pipe material as specified in other sections, or other as approved by County.

**1.06** PIPE SADDLES

- A. The Contractor shall use pipe saddles only on rehabilitated sanitary sewer mains.
- B. The Contractor shall supply Romac Industries, Inc. Style "CB" sewer saddle, branch type universal or County approved equal. The Contractor shall use a saddle fabricated to fit the outside diameter of the pipe to which it will be attached.
- C. The Contractor shall use 1/2-inch stainless steel band clamps for securing saddles to liner pipe.

**1.07** COUPLINGS AND ADAPTER

- A. For connection between new PVC pipe or DIP service lateral and an existing service the Contractor shall use a PVC C-900 rubber-gasketed transition adapter when going from D.I. or C-900 to Schedule 40.

**1.08** Cleanouts

- A. PVC, SDR 35 pipe and fitting shall be utilized for the installation of 4 or 6-inch cleanouts.
- B. Couplings as manufactured by Fernco Inc., Vac-A-Tee or County approved equal shall be utilized for pipe connection to the existing pipe.
- C. Rubber doughnut gasket adapters shall be manufactured by Fernco, Inc. or County approved equal.
- D. Non-traffic grade cleanout boxes shall be Russell C-382 SS or County approved equal.
- E. Traffic grade cleanout boxes shall be \_\_\_\_\_



## EXECUTION

### 1.09 PROTECTION

- A. The Contractor shall not allow sand, debris, or runoff to enter sewer system.
- B. The Contractor shall ensure that wastewater does not backup into private property. The Contractor shall establish a plan to prevent sewer backups when reconnections are not accomplished in a timely manner.
- C. The Contractor shall provide for diversion of wastewater if necessary, in accordance with requirements of Section SSR 10, Wastewater Flow Control. The County may direct the Contractor to use cleanouts to bypass wastewater from adjacent facilities if the possibility of wastewater backup is likely.
- D. The Contractor shall be responsible for any and all damage to property due to his work.

### 1.10 PREPARATION

- A. The Contractor shall provide a minimum of 48-hour written notice to property owners whose sanitary sewer service will potentially be interrupted.
- B. The Contractor shall properly disconnect existing connections from the sewer and reconnect to the rehabilitated liner, as described in this section.
- C. The Contractor shall reconnect service connections, including those that go to unoccupied or abandoned buildings, unless directed otherwise by the County.
- D. The Contractor shall complete reconnection of all service lines within 24 hours.

### 1.11 Reconnection of segments replaced via pipe bursting

- A. The Contractor shall remove a portion of the existing sanitary sewer main or host pipe to expose the new sewer main and to provide sufficient working space for installing a prefabricated pipe saddle.
- B. The Contractor shall use a tapping machine to carefully cut the new sewer main making a circular hole properly sized to accept the stubout protruding from the underside of the saddle.
- C. The Contractor shall strap on the saddle using a stainless steel band on each side of the saddle and tighten the bands to produce a watertight seal.
- D. The Contractor shall remove and replace cracked, offset, or leaking service line from the center of the new sewer main up to the first fitting or 5-feet, which ever occurs first.
- E. The Contractor shall make up the connection between new sewer main and existing service lateral using PVC C-900 or ductile iron sewer pipe and approved fittings and couplings.

**1.12 RECONNECTION ON REPLACEMENT SEGMENTS**

- A. The Contractor shall install a new service wye on the new sanitary sewer main for each service connection. The service wye shall be of a material compatible with the sewer main material.
- B. The Contractor shall remove and replace cracked, offset, or leaking service line from the center of the new sewer main up to the first fitting or 5-feet, which ever occurs first.
- C. The Contractor shall make up the connection between new sewer main and existing service lateral using PVC C-900 or ductile iron sewer pipe and approved fittings and couplings.

**1.13 UTILITY SERVICE REPAIRS**

- A. Where service connections or lines from water or gas mains or sewers to the user's premises are disconnected, broken, damaged, or otherwise rendered inoperative by the Contractor for any reason, he shall, at his own expense, arrange with the respective utility company for any repairs of lines under their jurisdiction, or for any lines not within their jurisdiction, the Contractor shall repair or replace same and restore service to the premises.

**1.14 Cleanouts**

- A. This work requires the Contractor to excavate or vacuum and expose the existing sanitary sewer service lateral connection between the edge of pavement and the outer edge of the road right-of-way or within an easement area.
- B. Excavate the area, staying within the right-of-way or easement, to sufficient width and depth to facilitate the proper saw cut and preparation of the pipe to allow for installation of the cleanout. Do not excavate on private property unless directed in writing by the County.
- C. In the excavation where the service lateral is exposed, install a PVC wye or Vac-A-Tee saddle to the service lateral to facilitate a rigid connection.
- D. In those excavations that do expose the 4" house lateral on the customer side of the excavation, the installation is to be connected as shown in the Rockdale County Specifications for the Construction of Sewer Mains. In excavations that do not expose the 4" house lateral on the customer side, PVC SDR 35 pipe is to be coupled to the 6" PVC wye or Vac-A Tee saddle.
- E. All installations are to be bedded utilizing #57 stone to support and secure the cleanout.
- F. The cleanout is to be extended to within 2 inches of final grade and at an angle not to exceed 11 ¼ degrees in any direction after backfill is completed. Only "sweeping bends" may be utilized to adjust the vertical alignment of the cleanout to facilitate video and maintenance equipment.
- G. Excavation shall be carefully backfilled to eliminate the possibility of damaging the cleanout.
- H. Cleanout box shall be centered over the cleanout and installed at finished grade level with pre-excavated conditions.

- I. The Contractor shall restore or replace all removed or damaged paving, curbing, sidewalks, gutters, shrubbery, fences, sod, grass or other disturbed surfaces or structures in a condition equal to or better than the existing conditions of that prior to work beginning and to the satisfaction of the County within 7 calendar days of completing each individual cleanout installation.
- J. All excess materials, dirt and rubbish shall be removed from the job site and disposed of by the Contractor within 7 calendar days. All such materials shall be disposed of in accordance with all applicable Federal, State, and local laws, ordinances and regulations and at no cost to the County.

**1.15** Special considerations

- A. Notify the County of any service stub that is collapsed, has severe root intrusions, or is otherwise in poor condition. The County will make a determination on a case-by-case basis whether to proceed with the cleanout installation or replace the entire service stub. All replacement service stubs will be 6" and will be installed per Rockdale County Sanitary Sewer Standards.
- B. Notify the County of conflicts with other utilities, which prevent the installation of a cleanout as specified herein and make recommendations to resolve such conflicts.
- C. Every effort should be made to complete the installation and backfill excavations each day. In situations where the installation cannot be completed, the site may ONLY be left open overnight with proper safety barriers and warning signs alerting the public to the hazard. The Contractor shall be responsible for providing and installing all barriers, barricades, fence, warning tape and other items necessary to safely secure the site.
- D. Without written permission from the property owner, the spoil pile may ONLY be placed within the easement area, right-of-way or County roadway and is not to be placed on private property. Where pedestrian or vehicular traffic is obstructed, the Contractor shall provide adequate safety measures to protect against accident or injury.
- E. Vehicles and construction equipment are not to be parked and left on private property.
- F. Contractor must repair damages to sprinkler systems including those that are installed within the county right-of-way and/or sanitary sewer easement. It is recommended that the contractor confer with each property owner concerning the possibility of sprinklers and the locations thereof during the notification process.

**1.16** TESTING

- A. The completed cleanout installation shall be televised, both externally and internally with a color camera. The same camera shall capture and record a picture of the house or street address of the installation. Without pause in recording, pan over the restoration of property, the cleanout box and insert the camera into the cleanout installation. Pass the camera through the cleanout, into the wye and through that portion of the 4- or 6-inch pipe installed. A copy of the videotape (VHS format) showing each installation shall be provided to the County along with the request

for payment. Any defects found during inspection shall be noted and corrected at no additional expense to the County. The Contractor shall make appropriate repairs until the cleanout installation passes the video inspection.

- B. When directed by the County, perform smoke testing, dye testing, or low pressure hydraulic testing to confirm reconnection.
- C. All inspections shall be submitted following the standards and formats as outlined in SSR 1\_Sanitary Sewer Television-Sonar Inspection warranty.

**1.17 DOCUMENTATION**

- A. The Contractor shall complete work on each asset as assigned via the County's Computerized Work Order Management system. Upon start of work, the Contractor shall receive work orders as assigned by the Project Manager. The Contractor shall utilize the Mobile Work Manager to maintain and synchronize the status of each rehabilitation work order issued.
- B. The Contractor shall be responsible for providing all computer hardware necessary to use GBA Mobile Master.
- C. The Contractor shall be responsible for acquiring the appropriate version license of GBA Mobile Master.

**1.18 WARRANTY**

- A. The Contractor shall guarantee his work for a warranty period of 1 year from the date of acceptance by the County. If, at anytime during the warranty period, any leakage, cracking, loss of bond, or other discontinuity is identified, the Contractor shall make repairs acceptable and at no additional cost to the County.

END OF SECTION

**SECTION 02728**  
**SANITARY SEWER MANHOLE REHABILITATION**

**PART 1 GENERAL**

**1.01 WORK THIS SECTION**

- A. Rehabilitation of manholes/vaults (manhole). The repair, replace, rebuild and seal the base, trough, bench, walls, cone, grade adjustment and frame & cover including the removal of any unsound material. Work includes surface preparation, sealing and testing.
  
- B. Provide the following items, but not limited to, as directed by the County:
  - a. Pressure grout leaks.
  - b. Repair leaking crack, joint and/or lift hole with hydraulic cement mortar.
  - c. Repair non-leaking crack, joint and/or lift hole with cement mortar.
  - d. Restore the structural integrity by lining the manhole with cement mortar.
  - e. Provide corrosion barrier by lining the manhole with an epoxy coating.
  - f. Restore the structural integrity of the manhole while providing corrosion barrier by installing a fiberglass insert liner.
  - g. Rebuild bench and trough using cement mortar.
  - h. Provide thickness gauges, wet film gauges and other testing equipment to test the thicknesses as required by this specification.
  - i. Perform and pass vacuum test of a manhole.
  - j. Provide survey grade (+/- 0.01-foot) data on a manhole using GPS.
  - k. Provide survey grade (+/- 0.01-foot) data on a manhole using conventional survey methods.
  - l. Provide bypass pumping to facilitate rehabilitation activities.
  - m. Provide manhole condition assessment services.
  - n. Remove, install and replace manhole frame and covers.
  - o. Locate and expose buried manholes.
  - p. Raise or lower the manhole frame & cover thru the addition or remove of bricks and manhole barrel sections.
  - q. Install internal frame seal.

**1.02 REFERENCES**

- A. Codes, Specifications, and Standards: (None cited)
  
- B. Testing and Materials Standards  
American Society of Testing and Materials (ASTM)

- C. Specifications for Construction of Sewer Mains, Rockdale County Department of Water Resources
- D. General Conditions for Rockdale County Construction Contracts, Rockdale County

### **1.03 Definitions (NONE CITED)**

### **1.04 EXPERIENCE**

- A. Supervisor of the field crews shall have received proper training in this type of work and have a minimum of five (5) years experience in performing this work including safe working practices, confined space safety procedures, the types of equipment being used, product/materials being used, etc.
- B. Field crew leaders performing this type of work shall have received proper training in this function and have a minimum of three (3) years experience in performing this work including safe working practices, confined space safety procedures, the types of equipment being used, product/materials being used, etc.
- C. The Contractor shall not employ any procedure or utilize any equipment that the Contractor's personnel do not have the above stated minimum experience with.
- D. No crewmembers shall enter confined spaces without the necessary certified training and at least one-year experience.
- E. The Contractor shall provide the County with written documentation that the supervisor, crew leader/s and all crewmembers have received the proper training and where required the requisite experience.
- F. For epoxy coating and fiberglass liner applicators/installers:
  - 1. Manufacturer certification that the applicator/installer has been trained in the proper handling, mixing, application, installation of the high build epoxy coating and/or fiberglass liner and is approved by the manufacturer.
  - 2. Documentation of the applicator/installer's experience with high build epoxy coating and/or fiberglass inserts. Documentation must include references names with contact phone numbers. The applicator/installer must prove reasonable experience, as determined by the County, with the coating and/or insert they intend to use on the project.

### **1.05 SUBMITTALS**

- A. Submit the following at least 30 calendar days prior to starting manhole/vault rehabilitation:

1. Manufacturers' Certificate of Compliance certifying compliance with the applicable specifications and standards. The certifications shall list all materials furnished under this Section.
2. Certified copies of test reports of factory tests required by the applicable standards, the manufacturer, and this Section.
3. Manufacturer's handling, storage, and installation instructions and procedures.
4. Recommended lining thickness design to withstand groundwater pressure as specified in Part 3 of this Section.
5. Shop drawings and samples for any material proposed as equivalent or alternative to a specified material. Submit sufficient manufacturer's information to support equivalency or suitability to the satisfaction of the County.

#### **1.06 LINING SYSTEMS**

- A. The lining system used shall result in a monolithic structure to the shape and contour of the interior of the existing manhole. The lining system shall be completely water tight and free of any joints or openings other than pipe inlets, pipe outlets and the rim opening. The junction of the lining material with the pipe material at the inlets and outlets shall be watertight.

#### **1.07 MEASUREMENTS AND PAYMENT**

- A. Payment for pressure grouting a leak made at the unit price bid. Payment will be full compensation for furnishing all materials, labor, tools, flow control and equipment necessary to perform all work. Payment shall be made under Manhole Rehab, Pressure Grout Leak, per each.
- B. Payment for the pressure grout compound actually injected shall be made at the unit price bid. Payment will be full compensation for furnishing all materials, labor, tools and equipment necessary to perform all work. Payment shall be made under Manhole Rehab, Pressure Grout Used, per gallon.
- C. Payment for repairing a leaking crack/joint with hydraulic cement shall be made at the unit price bid. Payment will be full compensation for furnishing all materials, labor, tools, cleaning, stopping of infiltration, patching, flow control of plugging/blocking and equipment necessary to perform all work. The quantity shall be the actual linear feet length of the crack/joint repaired to the nearest 1.0-linear foot. Payment shall be made under Manhole Rehab, Mortar Grout Leaking Crack/Joint, per linear foot.

- D. Payment for repairing a leaking lift hole with hydraulic cement shall be made at the unit price bid. Payment will be full compensation for furnishing all materials, labor, tools, cleaning, stopping of infiltration, patching, flow control of plugging/blocking and equipment necessary to perform all work. Payment shall be made under Manhole Rehab, Mortar Grout Leaking Lift Hole, per each.
- E. Payment for repairing a non-leaking crack/joint with cement mortar shall be made at the unit price bid. Payment will be full compensation for furnishing all materials, labor, tools, cleaning, stopping of infiltration, patching, flow control of plugging/blocking and equipment necessary to perform all work. The quantity shall be the actual linear feet length of the crack/joint repaired to the nearest 1.0-linear foot. Payment shall be made under Manhole Rehab, Mortar Grout Non-Leaking Crack/Joint, per linear foot.
- F. Payment for repairing a non-leaking lift hole with cement mortar shall be made at the unit price bid. Payment will be full compensation for furnishing all materials, labor, tools, cleaning, stopping of infiltration, patching, flow control of plugging/blocking and equipment necessary to perform all work. Payment shall be made under Manhole Rehab, Mortar Grout Non-Leaking Lift Hole, per each.
- G. Payment for cement mortar, ½-inch minimum thickness up to 2-inches thick, rehabilitation of manholes from bench to frame shall be made at the unit price bid. Payment will be full compensation for furnishing all materials, labor, tools, cleaning, stopping of infiltration, patching, flow control of plugging/blocking and equipment necessary to perform all work. Payment shall be made under Manhole Rehab, Cement Mortar Rehab, Manhole Diameter (inches), per vertical foot.
- H. Payment for cement mortar, ½-inch minimum thickness up to 2-inches thick, rehabilitation of vaults from bench to frame shall be made at the unit price bid. Payment will be full compensation for furnishing all materials, labor, tools, cleaning, stopping of infiltration, patching, flow control of plugging/blocking and equipment necessary to perform all work. Payment shall be made under Manhole Rehab, Cement Mortar Rehab - Vault, per square foot.
- I. Payment for additional cement mortar above 2-inches thick, (as determined by the County) from bench to frame shall be made at the unit price bid. Payment will be full compensation for furnishing all materials, labor, tools, cleaning, stopping of infiltration, patching, flow control of plugging/blocking and equipment necessary to perform all work. Payment shall be made under Manhole Rehab, Cement Mortar Rehab – Additional Mortar, per cubic foot.
- J. Payment for 100 mils minimum thickness thick epoxy lining of manholes shall be made at the unit price bid. Payment will be full compensation for furnishing all materials, labor, tools, cleaning, stopping of infiltration, patching, flow control of



plugging/blocking and equipment necessary to perform all work. Payment shall be made under Manhole Rehab, 100 Mils Thick Epoxy Lining, Manhole Diameter (inches), per vertical foot.

- K. Payment for 100 mils minimum thickness epoxy lining of vaults shall be made at the unit price bid. Payment will be full compensation for furnishing all materials, labor, tools, cleaning, stopping of infiltration, patching, flow control of plugging/blocking and equipment necessary to perform all work. Payment shall be made under Manhole Rehab, 100 Mils Thick Epoxy Lining – Vault, per square foot.
- L. Payment for fiberglass insert rehabilitation of manholes shall be made at the unit price bid. Payment will be full compensation for furnishing all materials, labor, tools, cleaning, stopping of infiltration, patching, flow control of plugging/blocking and equipment necessary to perform all work. Payment shall be made under Manhole Rehab, Fiberglass Insert, Manhole Diameter (inches), per vertical foot.
- M. Payment for fiberglass insert rehabilitation of vaults shall be made at the unit price bid. Payment will be full compensation for furnishing all materials, labor, tools, cleaning, stopping of infiltration, patching, flow control of plugging/blocking and equipment necessary to perform all work. Payment shall be made under Manhole Rehab, Fiberglass Insert - Vault, per square foot.
- N. Payment for bench and trough rehabilitation of manholes shall be made at the unit price bid. Payment will be full compensation for furnishing all materials, labor, tools, cleaning, stopping of infiltration, patching, flow control of plugging/blocking and equipment necessary to perform all work. Payment shall be made under Manhole Rehab, Repair Manhole Bench and Trough, per each.
- O. Payment for bench and trough rehabilitation of vaults shall be made at the unit price bid. Payment will be full compensation for furnishing all materials, labor, tools, cleaning, stopping of infiltration, patching, flow control of plugging/blocking and equipment necessary to perform all work. Payment shall be made under Manhole Rehab, Repair Vault Bench and Trough, per each.
- P. Payment for vacuum test shall be made at the unit price bid. Payment will be full compensation for furnishing all materials, labor, tools, flow control and equipment necessary to perform all work. Payment shall be made under Manhole Rehab, Vacuum Test, per each.
- Q. Payment for resetting an existing manhole frame and cover shall be made at the unit price bid. Payment will be full compensation for furnishing all materials, labor, tools, flow control of plugging/blocking and equipment necessary to perform all work. Payment shall be made under Manhole Adjust – Unpaved Area, Re-set Existing Manhole Frame and Cover, per each.

- R. Payment for removing existing manhole frame & cover and replace with standard frame & cover shall be made at the unit price bid. Payment will be full compensation for furnishing all materials (except the standard frame & cover is provided by the County), labor, tools, flow control of plugging/blocking and equipment necessary to perform all work. Payment shall be made under Manhole Adjustment – Unpaved Area, Removing Existing Frame & Cover and Replace With Standard Frame & Cover, per each.
- S. Payment for removing existing manhole frame & cover and replace with watertight (bolt down) frame & cover shall be made at the unit price bid. Payment will be full compensation for furnishing all materials (except the watertight frame & cover is provided by the County), labor, tools, flow control of plugging/blocking and equipment necessary to perform all work including anchoring the frame to concrete with four (4) stainless steel anchor bolts and epoxy cement to form a watertight joint between the frame and the concrete. Payment shall be made under Manhole Adjustment – Unpaved Area, Removing Existing Frame & Cover and Replace With Watertight Frame & Cover, per each.
- T. Payment for Priority Repair (work completed within 48-hours) shall be made at the unit price bid. Payment will be full compensation for completing the requested work within 48 hours of receiving notification from the County. Payment shall be made under Miscellaneous, Fee for Priority Repair, per each.
- U. Payment for Locating and Exposing Buried Manhole shall be made at the unit price bid. Payment will be full compensation for furnishing all materials, labor, tools, and equipment necessary to perform all work. Payment shall be made under Manhole Adjust-Unpaved Area- Locate and Expose Buried Manhole, per each.
- V. Payment for Raising Manhole Frame & Cover Elevation Up To 1.0-foot shall be made at the unit price bid. This work would typically be accomplished by grade adjustment with bricks and/or concrete grade rings. Payment will be full compensation for furnishing all materials, labor, tools, flow control of plugging/blocking and equipment necessary to perform all work. Payment shall be made under Manhole Adjust-Unpaved Area, Raise Manhole Frame & Cover Elevation 1.0-Foot, per each.
- W. Payment for installing a 1.0-Foot Precast Manhole Barrel Section shall be made at the unit price bid. Payment will be full compensation for furnishing all materials (including barrel), labor, tools, flow control of plugging/blocking and equipment necessary to perform all work. Payment shall be made under Manhole Adjust-Unpaved Area, Install 1.0-Foot Manhole Barrel Section, Diameter (48, 60 or 72-inch), per each.
- X. Payment for installing a 2.0-Foot Precast Manhole Barrel Section shall be made at the unit price bid. Payment will be full compensation for furnishing all materials (including barrel), labor, tools, flow control of plugging/blocking and equipment

necessary to perform all work. Payment shall be made under Manhole Adjust-Unpaved Area, Install 2.0-Foot Manhole Barrel Section, Diameter (48, 60 or 72-inch), per each.

- Y. Payment for installing a 4.0-Foot Precast Manhole Barrel Section shall be made at the unit price bid. Payment will be full compensation for furnishing all materials (including barrel), labor, tools, flow control of plugging/blocking and equipment necessary to perform all work. Payment shall be made under Manhole Adjust-Unpaved Area, Install 4.0-Foot Manhole Barrel Section, Diameter (48, 60 or 72-inch), per each.
- Z. Payment for Installing a Precast Manhole Cone shall be made at the unit price bid. Payment will be full compensation for furnishing all materials (including cone), labor, tools, flow control of plugging/blocking and equipment necessary to perform all work. Payment shall be made under Manhole Adjust-Unpaved Area, Install Manhole Cone, Diameter (48, 60 or 72-inch), per each
- AA. Payment for Lowering Existing Manhole Frame & Cover Up To 1.0-Foot by Removal Of Grade Adjustment shall be made at the unit price bid. This work would typically be accomplished by grade adjustment of the bricks and/or concrete grade rings. Payment will be full compensation for furnishing all materials labor, tools, flow control of plugging/blocking and equipment necessary to perform all work. Payment shall be made under Manhole Adjust-Unpaved Area, Lower Manhole Frame & Cover Elevation 1.0-Foot, per each.
- BB. Payment for Lowering Existing Manhole Frame & Cover By Removal of 1.0-Foot Precast Manhole Barrel shall be made at the unit price bid. Payment will be full compensation for furnishing all materials labor, tools, flow control of plugging/blocking and equipment necessary to perform all work. Payment shall be made under Manhole Adjust-Unpaved Area, Lowering Manhole Frame & Cover By Removal of 1.0-Foot Manhole Barrel Section, per each.
- CC. Payment for Lowering Existing Manhole Frame & Cover By Removal of 2.0-Foot Precast Manhole Barrel shall be made at the unit price bid. Payment will be full compensation for furnishing all materials labor, tools, flow control of plugging/blocking and equipment necessary to perform all work. Payment shall be made under Manhole Adjust-Unpaved Area, Lowering Manhole Frame & Cover By Removal of 2.0-Foot Manhole Barrel Section, per each.
- DD. Payment for Lowering Existing Manhole Frame & Cover By Removal of 4.0-Foot Precast Manhole Barrel shall be made at the unit price bid. Payment will be full compensation for furnishing all materials labor, tools, flow control of plugging/blocking and equipment necessary to perform all work. Payment shall be made under Manhole Adjust-Unpaved Area, Lowering Manhole Frame & Cover By Removal of 4.0-Foot Manhole Barrel Section, per each.

- EE. Payment for Anchoring a Manhole Frame to Concrete With Four (4) Stainless Steel Anchor Bolts and Epoxy Cement, to form a watertight joint between the frame and the concrete, shall be made at the unit price bid. Payment will be full compensation for furnishing all materials labor, tools, flow control of plugging/blocking and equipment necessary to perform all work. Payment shall be made under Manhole Adjust-Unpaved Area, Anchor Manhole Frame to Concrete, per each.
- FF. Payment for Purchasing Rockdale County Standard Manhole Frame & Cover shall be made at the unit price bid. Payment will be full compensation for furnishing all materials, transportation, storage, labor, tools, and equipment necessary to perform all work. Payment shall be made under Miscellaneous, Purchase Rockdale County Standard Manhole Frame & Cover, per each.
- GG. Payment for Purchasing Rockdale County Watertight (boltdown) Manhole Frame & Cover shall be made at the unit price bid. Payment will be full compensation for furnishing all materials, transportation, storage, labor, tools, and equipment necessary to perform all work. Payment shall be made under Miscellaneous, Purchase Rockdale County Watertight Manhole Frame & Cover, per each.
- HH. Payment for purchasing 5/8-inch diameter by 1-1/2-inch long, hex bolt, full thread, Grade 5, medium carbon steel, zinc coated, 10 threads per inch (not security bolts) that fit Rockdale County Boltdown Manhole Frame & Cover shall be made at the unit price bid. Payment will be full compensation for furnishing all materials, transportation, storage, labor, tools, and equipment necessary to perform all work. Payment shall be made under Miscellaneous, Purchase Boltdown Steel Bolts, per each.
- II. Payment for purchasing and installing watertight gasket that fits Rockdale County boltdown manhole frame & cover shall be made at the unit price bid. Payment will be full compensation for furnishing all materials, transportation, storage, labor, tools, flow control of plugging/blocking and equipment necessary to perform all work including removal of the existing gasket, preparation of the manhole frame seating surface and installation of a new gasket. New gaskets will only be installed when a gasket is missing or when the existing gasket is deteriorated/damaged. Payment shall be made under Miscellaneous, Purchase & Install Watertight Gasket, per each.
- JJ. No payment will be made for accessing a manhole through it's frame and cover. Includes, but is not limited to, the use compounds/methods to loosen bolts, cleaning of bolt & frame threads to remove rust, and use of anti-seize on all threads. The Contractor must provide all labor, equipment and materials (except when the Department specifically states it will provide standard bolts, security bolts and/or security bolt keys). At no time is a manhole cover to be pried as this could result in damage to the cover, frame or both. Manhole frames and/or covers damaged by the Contractor shall be replaced at no cost to the Department. If an existing bolt can't be reused then a County provided bolt or a Contractor purchased bolt must be installed.

Note: When accessing a boltdown cover it is best to return the cover to its original hole alignment. This assures the best alignment of the hole pattern in the cover with the hole pattern in the frame.

- KK. Payment for access a manhole thru its difficult cover and frame shall be made at the unit price bid. (The difficulty of the frame and cover must be verified by a County Inspector) Includes, but is not limited to, the removal of difficult bolts whether they must be cut, drilled, tapped, pulled, etc. Includes the installation of bolts even when tapping new threads into the frame, etc. are required. The Consultant/Contractor must provide all labor, equipment and materials (except when the Department specifically states it will provide standard bolts, security bolts and/or security bolt keys) required to perform this item. At no time is a manhole cover to be pried as this could result in damage to the cover, frame or both. The standard use of, but is not limited to, the use compounds/methods to loosen bolts, cleaning of bolt & frame threads to remove rust, and use of anti-seize on all threads is provided at no additional cost. Manhole frames and/or covers damaged by the Consultant/Contractor shall be replaced at no cost to the Department. If an existing bolt can't be reused then a County provided bolt or a Contractor purchased bolt must be installed. Note: When accessing a boltdown cover it is best to return the cover to its original hole alignment. This assures the best alignment of the hole pattern in the cover with the hole pattern in the frame. Payment shall be made under Miscellaneous, Access Difficult Manhole, per each.
- LL. Separate payment will not be made for asset management. The cost of asset management must be included in other unit cost.

## **PART 2 - PRODUCTS**

### **1.01 GENERAL**

#### **A. Materials:**

1. The materials used shall be designed, manufactured, and intended for sewer manhole/vault rehabilitation and the specific application in which they are used. The materials shall have a proven history of performance in sewer manhole/vault rehabilitation. The materials shall be delivered to the job site in original unopened packages and clearly labeled with the manufacturer's identification and printed instructions. All materials shall be stored and handled in accordance with recommendations of the manufacturer. All materials shall be mixed and applied in accordance with the manufacturer's written instructions.
2. The Contractor shall warrant and save harmless the County against all claims for patent infringement and any loss thereof.
3. Dispose of all wastes in accordance with applicable regulations.

4. Each coating/lining system shall be designed for application over wet surfaces (but not active running water) without degradation of the final product and/or the bond between the product and the manhole/vault surfaces.

B. Pressure grout active leaks:

1. Pressure grout shall be an acrylamide gel pressure sealant system provided by a single manufacturer. System shall consist of a dry powder chemical that readily dissolves in water to form a low viscosity solution that stiffens to a gel when mixed with an aqueous persulphate catalyst and a triethanolamine activator.
2. The system shall have the following characteristics:
  - 2.a Minimum 10 percent acrylamide base material by weight in the total sealant mix.
  - 2.b A higher concentration (percent) of acrylamide base material may be used to increase strength or offset dilution during injection.
  - 2.c Minimum absolute viscosity of 1.2 centipoise.
  - 2.d Manufacturer's provided additives to increase viscosity, adjust cure time though the range of 10 seconds to 1 hour, density, shrinkage, compressive strength, tensile strength, and pH.
  - 2.e Cured product is resistant to dehydration, homogeneous, chemically stable, non-biodegradable, firm, flexible gel.
3. Pressure grout system shall be AV100 acrylamide gel by Avanti International or approved alternate.

C. Stopping active leaks (hydraulic cement):

1. A premixed fast-setting, volume-stable waterproof cement plug consisting of hydraulic cement, graded silica aggregates, special plasticizing and accelerating agents. It shall not contain chlorides, gypsum's, plasters, iron particles, aluminum powder or gas-forming agents, or promote the corrosion of steel it may come in contact with. Set time shall be approximately 1 minute. Ten-minute compressive strength shall be approximately 500 psi.
  - 1.a Product shall be designed to rapidly stop flowing leaks in vertical and horizontal, concrete and masonry surfaces.
  - 1.b Product shall develop high early compressive and tensile strength

<u>Cure Time</u>	<u>Compressive Strength</u> (ASTM C 109)	<u>Tensile Strength</u> (ASTM C190)
1 day	3500 psi	-----
7 day	4900 psi	290 psi
28 day	5500 psi	575 psi

1. Hydraulic cement shall be Hydra-Plug manufactured by Quadex, Mainstay ML-10 by Madewell Products Corporation, PRECO Patch manufactured by Fosroc, OCTOCRETE manufactured by IPA Systems, or approved equal.
  2. A silicate-based liquid accelerator field mixed with neat Portland cement. The set time shall be approximately 1 minute.
  3. The elastomeric polyurethane resin-soaked method, using dry twisted jute oakum, or resin-rod with polyurethane resin (water activated).
- D. Patching, repointing, filling, and repairing nonleaking holes, cracks, and spalls in concrete and masonry manholes (Cement Mortar):

1. A premixed nonshrink cement-based patching material consisting of hydraulic cement, graded silica aggregates, special plasticizing and accelerating agents, which has been formulated for vertical or overhead use. It shall not contain chlorides, gypsums, plasters, iron particles, aluminum powder, or gas-forming agents or promote the corrosion of steel it may come into contact with. Set time (ASTM C-191) shall be less than 30 minutes. One-hour compressive strength (ASTM C-109) shall be a minimum of 200 psi and the ultimate compressive strengths (ASTM C-882-Modified) shall be a minimum of 1700 psi.

2. The product shall display the following properties: Strength (psi)

	Day	7 Day	28 Day
Compressive Strength (ASTM C 109)	3875	4550	6190
Flexural Strength (ASTM C 78)	-----	825	985
Tensile Strength (ASTM C 190)	-----	290	575
Shrinkage (ASTM C 157, Modified)	0.04 Percent @ 28 Days		

3. Shall be a factory blended, low shrinkage, high strength, polymer modified, sprayable microsilica mortar.

4. The cement mortar shall be QM-1s Restore by Quadex, Inc., Mainstay ML-72 by Madewell Products Corporation, TPM #723 by Sherwin-Williams or approved alternate.

E. Spray applied or centrifugally cast lightweight structural reinforced cement manhole lining (Cement Mortar):

1. A premixed nonshrink cement-based patching material consisting of hydraulic cement, graded silica aggregates, special plasticizing and accelerating agents, which has been formulated for vertical or overhead use. It shall not contain chlorides, gypsums, plasters, iron particles, aluminum powder, or gas-forming agents or promote the corrosion of steel it may come into contact with. Set time (ASTM C-191) shall be less than 30 minutes. One-hour compressive strength (ASTM C-109) shall be a minimum of 200 psi and the ultimate compressive strengths (ASTM C-882-Modified) shall be a minimum of 1700 psi.
2. The product shall display the following properties: 

	Day	7 Day	28 Day
Compressive Strength (ASTM C 109)	3875	4550	6190
Flexural Strength (ASTM C 78)	-----	825	985
Tensile Strength (ASTM C 190)	-----	290	575
Shrinkage (ASTM C 157, Modified)	0.04 Percent @ 28 Days		
3. Shall be a factory blended, low shrinkage, high strength, polymer modified, sprayable microsilica mortar.
4. Shall be suitable for low-pressure spray or trowel application for the repair of vertical and horizontal concrete and masonry structures.
5. Cement mortar shall be QM-1s Restore by Quadex, Inc., Mainstay ML-72 by Madewell Products Corporation, MS-2A by Strong or approved alternate.

F. Spray applied corrosion protection (epoxy coating):

1. Only structures exhibiting damage due to corrosion can receive the epoxy coating.
2. The material sprayed onto the surface of the manhole shall be 100% solids high build epoxy coating formulated for application within a sanitary sewer environment.



3. The coating thickness shall be a minimum of 100 mils in one or two multi-pass coats.
4. The coating color shall typically be white or off white.
5. If an adhesion coating is required between the concrete structure and the epoxy coating the cost of that adhesion coat is included in the cost of the 100% solids, high build epoxy coating.
6. The cured epoxy resin system shall conform to the following minimum structural standards :

	<u>Strength (psi)</u>
Compressive Strength (ASTM D-695)	13,000
Flexural Stress (ASTM D-790)	13,000
Tensile Stress (ASTM D-638)	7,000
Flexural Modulus (ASTM-790)	500,000 psi

7. The epoxy coating shall be Mainstay DS-5 by Madewell Products Corporation, Raven 405 by Raven Lining Systems, Cor-Cote SC (Sewer Coat) by Sherwin-Williams or approved alternate.

G. Composite structure/corrosion protection system:

1. Only structures exhibiting damage due to corrosion can receive the composite system.
2. The product shall display the following properties:

	<u>Strength (psi)</u>		
	Day	7 Day	28 Day
Compressive Strength (ASTM C 109)	8000	9000	10000
Flexural Strength (ASTM C 293)	-----	1400	1600
Tensile Strength (ASTM C 496)	-----	900	900

Shrinkage (ASTM C 596)      0.08 Percent @ 28 Days

3. The coating thickness shall be a minimum of ½-inch.
4. If an adhesion coating is required between the concrete structure and the composite system the cost of that adhesion coat is included in the cost of the composite system.

5. The composite system shall be SewperCoat by Lafarge Aluminates or approved alternate.
- H. The hydraulic cement, cement mortar, epoxy coating and composite system do not have to be from the same manufacturer however the Contractor is responsible for assuring compatibility of the various components.
- I. Fiberglass Insert Liner:
1. The materials used for lining manholes shall be engineered to support a standard 16,000-pound vertical dynamic wheel load (AASHTO H-20) when used in conjunction with the reinforced precast manhole cone or integral fiberglass cone section.
  2. The manhole shall be fitted with a fiberglass liner with no sidewall joints, seams or sections. The fiberglass manhole insert liner shall meet all requirements of ASTM Specification D3753 for glass fiber reinforced polyester manholes.
  3. The annular void grout shall be standard 6-bag (Type II) Portland Cement mix with  $\frac{1}{4}$ " (maximum) coarse aggregate producing a minimum 3000 psi compressive strength at full cure (28 days).
  4. A quick setting, high strength cement grout shall be used for positioning and sealing the fiberglass manhole insert liner prior to annular void grouting.

## 1.02 EXECUTION

### 3.1 REHABILITATION OF MANHOLE STRUCTURE

#### A. General Procedures

1. Previous Work: Manholes previously rehabilitated under other projects shall not be rehabilitated if in good condition as determined by the County.
2. Cleaning: All concrete and masonry surfaces to be rehabilitated shall be clean. All grease, oil, laitance, coatings, loose bricks, mortar, unsound brick or concrete and other foreign materials shall be completely removed. Water blasting utilizing a 5000 psi pressure washer and proper nozzles shall be the primary method of cleaning; however, other methods such as wet or dry sandblasting, acid wash, concrete cleaners, degreasers or mechanical means may be required to properly clean the surface. All surfaces on which these methods are used shall be thoroughly rinsed,

scrubbed, and neutralized to remove cleaning agents and their reactant products. Debris resulting from cleaning shall be removed from the manhole and not discharged downstream.

3. Stopping Infiltration: After surface preparation and prior to the application of mortars and coatings, infiltration shall be stopped either by plugging with a hydraulic cement or chemical grout sealing.
4. Patching: All large holes and/or voids, joints or pipes, all spalled areas, all lifting holes and all holes caused by missing or cracked brick shall be patched and all missing mortar repointed using a nonshrink cement mortar. All cracked or disintegrated material shall be removed from the area to be patched or repointed, exposing a sound subbase. All cracks not subject to movement shall be cleaned to remove all unsound material so that a solid fixed surface is established and patched with nonshrink patching mortar.
5. Manhole Walls: The thicknesses of the patches, coatings, etc must be such that a uniform, vertical wall is established from the manhole bench to the manhole cone section.
6. Flow Control: The Contractor shall be responsible for plugging, plugging with flow-thru pipe or diverting the flow of sewage as needed for repair and rehabilitation of manholes. Sewer flow shall be maintained in accordance with Section SSR 10, Wastewater Flow Control of these Specifications. Bypass pumping will not be utilized unless approved in advance by the County.
7. Remove all loose grout and rubble from existing channel. Rebuild channel if required by reshaping, repairing slope of shelves or benches. Work shall include aligning inflow and outflow ports in such a manner as to prevent the deposition of solids at the transition point. All troughs shall follow the grades of the pipe entering the manhole. Changes in direction of the sewer and entering branch or branches shall have a true curve of as large a radius as the size of the manhole will permit, but will be shaped to allow easy entrance of maintenance equipment including buckets, T.V. camera, etc.
8. Manhole steps: Inspect all manhole steps prior to rehabilitation. Report to the County any steps that appear loose, deteriorated, broken, or otherwise unsafe. Unless directed otherwise, cut all loose, deteriorated, broken, or otherwise unsafe steps from the manhole.
9. Each lining system shall be installed in accordance with the manufacturer's recommendation to withstand groundwater pressures. For manholes greater than 12 feet in depth, the lining shall withstand the pressures associated with a groundwater

depth equal to the manhole depth. Linings for all other manholes shall withstand the pressures associated with groundwater depth of 12 feet. Measure groundwater depth from manhole bench to top of ground surface.

10. Application of products shall be by factory certified applicators.

### 3.2 SPRAY APPLIED LIGHTWEIGHT STRUCTURAL REINFORCED CEMENT

- A. The surface prior to spraying shall be damp without noticeable free water droplets or running water. Materials shall be spray-applied to a minimum uniform thickness to insure that all cracks, crevices, and voids are filled and a somewhat smooth surface remains after light troweling. The light troweling is performed to compact the material into voids and to set the bond.
- B. The first application shall have begun to take an initial set (disappearance of surface sheen, which could be 15 minutes to 1 hour depending upon ambient conditions) before the second application to assure a minimum total finished thickness of 1/2 inch. The final finished thickness may need to be greater than 1/2 inch as recommended by the manufacturer to withstand groundwater pressures. A depth gauge shall be used during application, at various locations, to verify the required thickness. The surface then shall be trowelled to smooth finish with care taken not to over trowel so as to bring additional water to the surface and weaken it. Manufacturer's recommendations shall be followed whenever more than 24 hours have elapsed between applications.
- C. The bench covers used to catch debris shall be removed and the bench and trough sprayed such that a gradual slope is produced from the walls to the trough with the thickness at the edge of the trough being no less than 1/2 inch. The wall-bench intersection shall be rounded to a uniform radius the full circumference of the intersection.
- D. No application shall be made to frozen surfaces or if freezing is expected to occur within the manhole for 24 hours after application. If ambient temperatures are in excess of 95° F, precautions shall be taken to keep the mix temperature at time of application below 90° F, using ice if necessary.
- E. The final application shall have a minimum of four (4) hours cure time before being subjected to active flow.

### 3.3 CENTRIFUGALLY CAST STRUCTURAL REINFORCED CEMENT

- A. The rotating casting applicator shall be positioned to evenly apply the material and be withdrawn at a rate to assure a final minimum thickness of 1/2-inch. The final finished thickness may need to be greater than 1/2-inch as recommended by the manufacturer to withstand groundwater pressures. A depth gauge shall be used during application, at

various locations, to verify the required thickness. The surface shall be trowelled to smooth finish with care taken not to over trowel so as to bring additional water to the surface and weaken it.

- B. The bench covers used to catch debris shall be removed and the bench and trough sprayed or hand applied so that a gradual slope is produced from the walls to the trough with the thickness at the edge of the trough being no less than 1/2-inch. The wall-bench intersection shall be rounded to a uniform radius the full circumference of the intersection. The surface shall be trowelled to smooth finish with care taken not to over trowel so as to bring additional water to the surface and weaken it.
- C. No application shall be made to frozen surfaces or if freezing is expected to occur within the manhole for 24 hours after application. If ambient temperatures are in excess of 95° F, precautions shall be taken to keep the mix temperature at time of application below 90° F.
- D. The final application shall have a minimum of one (1) hour cure time before being subjected to active flow.

#### 3.4 EPOXY coating

- A. The epoxy coating shall be applied onto the interior surfaces of the manhole to produce a smooth coating and yield the required minimum thickness. A depth gauge shall be used during application at various locations to verify the required thickness.
- B. The epoxy resin shall be applied at the required minimum thickness. The application shall have a minimum of three hours cure time before being subjected to active flow.
- C. The sloped surface of the manhole bench shall be made non-skid by broadcasting aluminum oxide, or sand into the surface prior to gelatin/set.

#### 3.5 fiberglass manhole insert liner

- A. This method requires the contractor to excavate and remove the existing manhole frame, grade adjustment, cone, and other portion as needed up to the full depth and the insertion of a prefabricated fiberglass insert liner.
- B. Excavate the area around the top of the existing manhole frame and portion of the existing manhole sufficiently wide and deep to facilitate the removal of the manhole frame and portion of the existing manhole to allow for the installation of a manhole liner.
- C. The bottom of the manhole liner shall be cut to fit the existing manhole bench as closely as possible. Cutouts in manhole liner shall be made to accommodate existing inlets, drops and cleanouts.

- D. The annular void between the manhole liner and the existing brick or concrete manhole shall be filled with a cement grout.
- E. All lamination of fiberglass shall result in equal thickness and strength as the manhole liner and be constructed in accordance with the manufacturer's recommendations.
- F. The manhole liner shall be lowered into the existing brick or concrete manhole and set into a quick setting grout mixture. A thorough bottom seal shall be obtained in order to prevent loss of grout from the annular space between the outside of the manhole liner and the interior of the old manhole. A 6-inch minimum height of a quick setting grout shall be placed above the initial bottom seal in the annular void area between the manhole liner and the existing brick or concrete manhole to ensure adequacy of the bottom seal. The gap from drops, cleanouts, laterals and existing piping between the existing manhole and the new manhole liner wall shall be bridged with short lengths of pipe of the same material as the liner and/or as approved by the liner's Design Engineer. All manhole surfaces not covered by the liner shall be hand covered with like material.

### 3.6 MANHOLE REHABILITATION ACCEPTANCE

- A. All manholes rehabilitated using cement mortar lining, epoxy lining or fiberglass insert lining shall be subject to testing using the vacuum test method. The contractor shall follow the manufacturer's recommendations for proper and safe procedures. Vacuum testing of manholes shall be performed after curing of linings. Any visible leakage in the manhole or structure, before, during, or after the test shall be repaired regardless of the test results.
- B. If the manhole fails the vacuum test, the Contractor shall perform, at no additional cost to the County, additional repairs and repeat the test procedures until satisfactory results are obtained.
- C. All pipes for vacuum testing entering the manhole shall be installed at the top access point of the manhole.
- D. A vacuum of 10 inches of mercury (Hg) (5.0 psi) shall be drawn on the manhole, and the time shall be measured for the vacuum to drop to 9 inches of mercury (Hg) (4.5 psi). Manholes will be considered to have failed the air test if the time to drop 1 inch of mercury is less than what is shown in the following table:

**Vacuum Test Timetable**  
**Manhole Diameter – Inches**

<b>Depth - feet</b>	<b>48 inches</b>	<b>60 inches</b>	<b>72 inches</b>	<b>96 inches</b>
4	30 sec.	30 sec.	30 sec.	30 sec.
8	30 sec.	30 sec.	32 sec.	38 sec.
12	30 sec.	39 sec.	48 sec.	57 sec.
16	40 sec.	52 sec.	64 sec.	76 sec.
20	50 sec.	65 sec.	80 sec.	95 sec.
24	60 sec.	78 sec.	96 sec.	114 sec.
+ Each 2'	+5 sec.	+6.5 sec.	+8.0 sec.	+9.5 sec.

- E. Manhole depths shall be rounded to the nearest foot. Intermediate values shall be interpolated. For depths above 24 feet, add the values listed in the last line of the table for each 2 feet of additional depth.
- F. After the manhole rehabilitation work has been completed, the County shall visually inspect the manhole. The finished surface shall be free of blisters, “runs” or “sags” or other indications of uneven lining thickness. No evidence of visible leaks shall be allowed.

**3.7 DOCUMENTATION**

- A. The Contractor shall be responsible for providing all computer hardware necessary to use GBA Mobile Master.
- B. The Contractor shall be responsible for acquiring the appropriate version license of GBA Mobile Master.
- C. Upon completion of Manhole Rehabilitation work, the Contractor shall provide documentation of work and change in asset status by submitting an inspection.

**3.8 WARRANTY**

- A. The Contractor shall guarantee his work for a warranty period of one (1) year from the date of final acceptance. If, at anytime during the warranty period, any leakage, cracking, loss of bond, or other discontinuity is identified, the Contractor shall make repairs at no additional cost to the County.
- B. The Contractor shall furnish an extended warranties from the liner manufacturer for manhole rehabilitation materials and from the Contractor for his work for a total of five (5) years from date of final acceptance.

END OF SECTION

**SECTION 02730**  
**SEWER LINES AND ACCESSORIES**

**PART 1 GENERAL**

**1.01 SCOPE**

- A. This section describes products to be incorporated into sewer lines and force mains and requirements for the installation and use of these items. Furnish all products and perform all labor necessary to fulfill the requirements of these specifications.
- B. Supply all products and perform all work in accordance with applicable ASTM, NSF, AWWA, ANSI, or other standards. The latest revisions of all standards are applicable.
- C. All products shall be cast, fabricated and manufactured in the United States of America.

**1.02 TRANSPORTATION, HANDLING, STORAGE AND PROTECTION**

- A. Furnish equipment and facilities for transporting, unloading, handling, distributing, and storing pipe, fittings, valves, hydrants and accessories in accordance with manufacturer's written recommendations.
- B. The Owner will reject any mishandled products without further justification.

**1.03 QUALITY ASSURANCE**

The manufacturer shall provide written certification to the Owner that all products furnished comply with the specifications.

**PART 2 PRODUCTS**

**2.01 PIPE AND ACCESSORIES**

- A. All pipe is subject to the inspection of Rockdale County at the pipe plant, jobsite, or other point of delivery.
- B. Ductile Iron Pipe (DIP): Ductile iron pipe shall be utilized as shown on the Drawings. All pipe shall be furnished in nominal lengths of at least 18 to 20 feet.



- C. Pipe and Fittings: Ductile iron pipe shall conform to AWWA C151 and shall be minimum Pressure Class 250 for gravity sewers and 350 for force mains unless shown otherwise on the Drawings. Pipe and fittings shall be cement lined in accordance with AWWA C104. Fittings shall conform to AWWA C153. Pipe and fittings shall be furnished with a bituminous outside coating. Tapping saddles shall be ductile iron.
1. Joints: Unless shown or specified otherwise, joints shall be push-on type for pipe and push-on or standard mechanical joints for fittings. Joints shall conform to AWWA C111. Restrained joints, where shown on the Drawings, shall be push-on joints restrained by any of the following systems: American "Fast-Grip", "Flex-Ring" or "Lok-Ring", U S Pipe "Field-Lok", "T R Flex" or T R Flex Gripper Ring". Mechanical joints, where shown, shall be restrained with "Mega-Lugs".
  2. Acceptance: Acceptance will be on the basis of the Rockdale County's inspection and the manufacturer's written certification that the pipe was manufactured and tested in accordance with the applicable standards.
  3. Polyethylene Encasement: Ductile iron pipe shall be encased with polyethylene film where shown on the drawings. Polyethylene film shall have a minimum thickness of 8 mils. Installation shall be in accordance with AWWA C105 and the manufacturer's instructions. All ends shall be securely closed with tape and all damaged areas shall be completely repaired.
  4. Service: Furnish the services of a competent factory representative of the pipe manufacturer for purposes of supervising and/or inspecting the installation of the pipe. Furnish one day of service.
- C. Polyvinyl Chloride (PVC) Gravity Sewer Pipe: PVC gravity sewer pipe shall be supplied in nominal lengths of 13 to 20 feet.
1. Pipe: PVC gravity sewer pipe and fittings 4 to 15-inches in diameter shall be manufactured in accordance with ASTM D 3034, SDR 35 or SDR 26 or ASTM F794 as specified. PVC gravity sewer pipe and fittings 18 to 21-inches in diameter shall be manufactured in accordance with ASTM F 679, minimum wall thickness T-1. Fittings for pipe 8-inches and less in diameter shall be one piece with no solvent-welded joints. Fittings for pipe 10-inches and larger may be fabricated using solvent welding. No field fabrication of fittings will be allowed. All such fabrication shall be performed at the factory and the fittings delivered ready for use.

2. Joints: Joints for pipe and fittings shall be of the integral bell and spigot type with a confined elastomeric gasket having the capability of absorbing expansion and contraction without leakage. Joints shall meet the requirements of ASTM D 3212; gaskets shall meet the requirements of ASTM F 477. The joint system shall be identical for pipe and fittings.
3. Detection Tape: Detectable mylar encased aluminum foil marking tape will be installed over all sewers. Tape will be green in color, at least 1-1/2-inches wide, and shall bear the printed identification "Caution: Buried Sewer Line Below" (reverse printed), so as to be readable through the mylar. Surface printing on the tape shall be equal to Lineguard Type II Detectable.
4. Acceptance: Acceptance will be on the basis of Rockdale County's inspection and the manufacturer's written certification that the pipe was manufactured and tested in accordance with the applicable standards.
5. Service: Furnish the services of a competent factory representative of the pipe manufacturer for purposes of supervising and/or inspecting the installation of the pipe. Furnish one day of service.

D. Flexible Adaptor Couplings and Donuts

1. Flexible Adaptor Couplings: Couplings for sewer pipe shall be elastomeric plastic sleeves designed to connect pipes of dissimilar materials. Adapters shall provide a positive seal against infiltration and exfiltration and remain leakproof and rootproof up to 4.3 psi. The adaptor manufacturer shall provide all stainless steel clamps and required accessories. Couplings shall be equal to Fernco and shall be installed in accordance with the manufacturer's recommendations.
2. Adaptor Donuts: Adaptor donuts shall be elastomeric polyvinyl chloride (PVC), compressible seals designed for sealing joints between sewer pipes of different sizes and/or dissimilar materials. Adapters shall provide a positive seal against infiltration and exfiltration and remain leakproof and rootproof up to 4.3 psi. Donuts shall be equal to products of Fernco and shall be installed in accordance with the manufacturer's recommendations.

E. Materials for Manholes: Provide materials for construction of manholes in accordance with the following:

1. Precast Concrete Sections: Precast concrete sections shall meet the requirements of ASTM C 478. The minimum compressive strength of the concrete in precast sections shall be 4,000 psi. The minimum wall thickness shall be one twelfth of the inside diameter of the riser of the largest cone diameter plus 1-inch, or such wall thickness suitable for use of rubber boot.

Transition slabs which convert bases larger than 4 feet in diameter to 4 foot diameter risers shall be designed by the manhole manufacturer to carry the live and dead loads exerted on the slab. Seal joints between precast sections by means of rubber O-ring gaskets or flexible butyl rubber sealant. Butyl rubber sealants shall meet the requirements of AASHTO M-198. Sealant shall be pre-formed type with a minimum nominal diameter of 1-inch. Butyl rubber sealant shall be equal to Kent Seal No. 2 or Concrete Sealants CS 202.

2. Manhole frames and covers shall be 24" ERGO WITH CAMLOCK anti-theft cover lock or approved equal.
3. Rubber Boots: Provide preformed rubber boots and fasteners equal to those manufactured by Kor-N-Seal or Press Seal Gasket Corporation.

## **PART 3 EXECUTION**

### **3.01 LOCATION AND GRADE**

- A. The Drawings shall show the alignment and slope of the sewer and the location of manholes and other appurtenances. The slope shown on the drawings is the slope of the invert of the pipe.
- B. After the centerline or baseline of the sewer is located, clear the easement. The Contractor shall take all precautions necessary, which shall include but not necessarily be limited to installing reference points, to protect and preserve the centerline or baseline.
- C. A temporary bench mark shall be provided at intervals along the sewer route for verification of sewer elevation. A hub shall be provided at the center line of each manhole and at all other locations where the alignment of the sewer changes.
- D. Construction shall begin at the low end of the sewer and proceed upstream without interruption. Multiple construction sites shall not be permitted without written authorization from Rockdale County for each site.

- E. Prior to beginning installation of any section of the sewer line, prepare cut sheets and submit them to the Owner for approval. No installation of the sewer shall commence prior to approval of the cut sheets.
- F. During clearing and construction, protect bench marks and verify their location and elevation. Preserve the location of the reference points and centerline of manholes, and provide all other control required to construct the line.

The Contractor shall be responsible for any damage done to reference points, base lines, center lines, and temporary bench marks, and shall be responsible for the cost of re-establishment of same.

### **3.02 EXISTING UNDERGROUND UTILITIES AND OBSTRUCTIONS**

- A. The Drawings shall indicate underground utilities or obstructions that are known to exist according to the best information available. The Contractor, as required by Georgia law, shall call the Utilities Protection Center (UPC) (800-282-7411) and those utilities, agencies or departments that own and/or operate utilities in the vicinity of the construction work site to verify the location of, and possible interference with, the existing utilities, arrange for necessary suspension of service and make arrangements to locate and avoid interference with said utilities. Where these or unforeseen underground utilities are encountered, the location and alignment may be changed, upon approval of the Owner.

### **3.03 CONSTRUCTION ALONG HIGHWAYS, STREETS, AND ROADWAYS**

Install sewer lines and appurtenances along highways, streets and roadways in accordance with the applicable regulations of and permits issued by the Georgia Department of Transportation, Rockdale County, City of Conyers with reference to construction operations, safety, traffic control, road maintenance and repair.

- A. Traffic Control
  - 1. The Contractor shall provide, erect and maintain all necessary barricades, suitable and sufficient lights and other traffic control devices; shall provide qualified flagmen where necessary to direct traffic; shall take all necessary precautions for the protection of the work and the safety of the public.
  - 2. Construction traffic control devices and their installation shall be in accordance with the current Georgia "Manual of Uniform Traffic Control Devices for Streets and Highways".

3. Placement and removal of construction traffic control devices shall be coordinated with the Department of Transportation, Rockdale County and City of Conyers a minimum of 24 hours in advance.
- B. Construction Operations: Perform all work along highways, streets and roadways to minimize interference with traffic.
1. Stripping: Where the pipe line is laid along road right-of-way, strip and stockpile all sod, topsoil and other material suitable for right-of-way restoration.
  2. Trenching, Laying and Backfilling: Do not open the trench any further ahead of pipe laying operations than is necessary. Backfill and remove excess material immediately behind laying operations. Complete excavation and backfill for any portion of the trench in the same day.
  3. Shaping: Reshape damaged slopes, side ditches, and ditch lines immediately after completing backfilling operations. Replace topsoil, sod and any other materials removed from shoulders.
- C. Excavated Materials: Do not place excavated material along highways, streets and roadways in a manner which obstructs traffic. Sweep all excavated material off of the pavement in a timely manner.
- D. Drainage Structures: Keep all side ditches, culverts, cross drains, and other drainage structures clear of excavated material and free to drain at all times.
- E. Maintaining Highways, Streets, Roadways and Driveways: Maintain streets, highways, roadways and driveways in suitable condition for movement of traffic.

During the time period between pavement removal and replacement, maintain highways, streets and roadways by the use of steel running plates. The backfill above the pipe shall be compacted as specified elsewhere up to the existing pavement surface to provide support for the steel running plates.

Furnish a front-end loader for maintaining highways, streets, and roadways. Make the front-end loader available at all times.

Repair all driveways that are cut or damaged immediately. Maintain them in a suitable condition for use until completion and final acceptance of the work.

### **3.04 CLEARING AND GRUBBING**

Clear and grub the permanent easement 10 feet on each side of the pipeline before excavating. Remove all trees, growth, debris, stumps and obstructions. Clear the construction easement or road right-of-way only if necessary.

- A. Clearing: All vegetable growth such as trees, shrubs, brush, logs, upturned stumps and roots of down trees, and other similar items shall be removed and disposed of properly. Cultivated growth shall be removed and trees felled as necessary.

Where the tree limbs interfere with utility wires, or where the trees to be felled are in close proximity to utility wires, the tree shall be taken down in sections to eliminate the possibility of damage to the utility.

All buildings, fences, lumber piles, trash, and obstructions, except utility poles, shall be removed and disposed of by the Contractor. Any work pertaining to utility poles shall comply with the requirements of the appropriate utility.

All Fences adjoining any excavation or embankment that may be damaged or buried shall be carefully removed, stored, and replaced.

- B. Grubbing: All stumps, roots, foundations and planking embedded in the ground shall be removed and disposed of. Piling and butts of utility poles shall be removed to a minimum depth of 2 feet below the limits of excavation for structures, trenches, and roadways or 2 feet below finish grade, whichever is lower.
- C. Disposal of Refuse: The refuse resulting from the clearing and grubbing operation shall be hauled to a disposal site secured by the Contractor and shall be disposed of in accordance with all requirements of federal, state, county and municipal regulations. No debris of any kind shall be deposited in any stream or body of water, or in any street or alley. No debris shall be deposited upon any private property except by written consent of the property owner. In no case shall any material be left on the project, shoved onto abutting private properties, or be buried on the project.

### **3.05 HANDLING MATERIALS**

- A. Unloading: Furnish equipment and facilities for unloading, handling, distributing and storing pipe, fittings, valves and accessories. Make equipment available at all

times for use in unloading. Do not drop or dump materials. Any materials dropped or dumped will be subject to rejection without additional justification.

- B. Distribution: Distribute and place pipe and materials to not interfere with traffic. Do not string pipe more than 1,000 feet beyond the area where pipe is being laid.
- C. Storage: Store all pipe which cannot be distributed along the route. Make arrangements for the use of suitable storage areas.

### **3.06 EXCAVATION OF TRENCHES**

Excavate trenches by open cut. Perform all excavation in accordance with the Occupational Safety and Health Act of 1970 (PL 91-596) as amended. The Contractor shall pay particular attention to Safety & Health Regulations Part 1926, subpart P "Excavations, Trenching & Shoring" as described in OSHA Publication 2226.

- A. Dimensions: Excavate trenches to the depths shown on the Standard Details for each class of bedding and for manholes and other structures.

If trenches are excavated to excessive dimensions or collapse, lay the pipe with the next better class of bedding. If excavation for manholes and other structures is made to excessive depth, backfill with compacted bedding material to the required grade.

- B. Bracing and Sheet piling: When required by regulations or to prevent damage to adjoining structures, roadways, pavements, utilities, trees or private property which are specifically required to remain, provide bracing and sheet piling.
- C. Dewatering Trenches: Dewater excavation continuously to maintain a water level below the bottom of the trench. Dewater running sand by well pointing. Where soil conditions do not permit use of well point, construct french drains of crushed stone or gravel to conduct water to sumps.
- D. Trench Stabilization: Wherever the material at the bottom of the trench is unsuitable for the proper installation of the pipe, the Engineer will direct the removal and replacement of the unsuitable material.

When so directed, undercut the trench and backfill with bedding material. Place and compact this material to bring the trench to the required grade.

- E. Rock Excavation

1. Definition of Rock: Any material that cannot be excavated with conventional excavating equipment, and is removed by drilling and blasting, and occupies an original volume of at least one-half cubic yard.
2. Excavation: Where rock is encountered in trenches, excavate to the minimum depth that will provide clearance below the pipe barrel of 8-inches for pipe 21-inches in diameter and smaller and 12-inches for larger pipe and manholes. Remove boulders and stones to provide a minimum of 6-inches clearance between the rock and any part of the pipe or manhole. The minimum width of trench rock for payment shall be 36-inches.
3. Blasting: Provide experienced workmen to perform blasting. Conduct blasting operations in accordance with all existing ordinances and regulations. Protect all structures from the effects of the blast. Repair any resulting damage.

In populated or developed areas, the contractor shall employ an independent blasting consultant to supervise the preparation for each blast and approve the quantity of each charge.

4. Removal of Rock: Dispose of, offsite, rock which is surplus or not suitable for use as rip rap or backfill.

F. Bedding:

Bed pipelines in accordance with the Standard Details and the following Specifications.

1. Materials: Bedding materials shall be crushed stone unless shown or specified otherwise. Crushed stone bedding material shall meet the requirements of Georgia Department of Transportation Specification 800.01 for No. 57 stone, Group II (quartzite granite). Earth bedding material shall be suitable materials selected from materials excavated from the trench. Materials shall be clean and free of rock, organics, and other unsuitable material.
2. General: Compact stone bedding material by tamping or slicing with a flatblade shovel. Prepare the trench bottom to support the pipe uniformly throughout its length. Provide bell holes to relieve pipe bells of all load.



If the trench is excavated to excessive width or depth, provide the next better class of bedding.

3. Gravity Sewers: Lay PVC pipe with minimum Class "B" bedding. Lay all other pipe with Class "C" bedding unless shown or specified otherwise.
4. Manholes: Excavate to a minimum of 12-inches below the planned elevation of the base of the manhole. Place and compact crushed stone bedding material to the required grade before constructing the manhole.
5. Compaction: Bedding under pipe and manholes not in roadway shall be compacted to a minimum of 85 percent of the maximum Standard Proctor density.

Bedding under pipe and manholes in roadways shall be compacted to 95% of maximum Standard Proctor density.

6. Bell Holes: At each joint, excavate bell holes of ample depth and width to permit the joint to be made properly and to relieve pipe bell of any load.
7. Force Mains: Unless specified or shown otherwise, bed force mains in suitable earth materials equal to Type 2 Laying Condition.

### **3.07 INSTALLING PIPE**

Install the pipe to conform accurately to the alignment and grade shown on the Drawings.

- A. Handling: Use suitable tools and equipment to handle and lay pipe. Prevent damage to the pipe. Examine all pipe for cracks and other defects as it is laid. Do not lay defective pipe or material.
- B. Sequence: Excavate, lay the pipe, and backfill as closely together as possible. Do not leave unjoined pipe in the trench overnight. Backfill and compact the trench as soon as possible after laying and jointing is completed. Cover the exposed end of the installed pipe each day at the close of work and at all other times when work is not in progress. If necessary to backfill over the end of an uncompleted pipe, close the end with a watertight plug.
- C. Placing and Jointing: Clean pipe, joint and fittings thoroughly before laying. Apply joint lubricant recommended by the pipe manufacturer. Center the spigot end in the bell of the preceding pipe and shove home. Immediately after jointing,

bring the pipe to final alignment and grade.

- D. Pressure Piping: Comply with A, B and C when laying pressure piping. In addition, the following requirements apply:
1. Make all joints in accordance with the manufacturer's recommendations.
  2. Take special precautions to prevent damage to the cement lining of ductile iron pipe.
  3. Lay force mains on a continuous grade as shown on the Drawings. Lay at the elevations shown on the drawings or 4 foot minimum cover, whichever is greater.
- E. House Connections: Install wyes or tees in locations designated by Rockdale County for future connection of service lines. Plug the branch of the wye or tee. Record the location of fittings.

### **3.08 BACKFILLING**

Backfill carefully to restore the ground surface to its original condition. Dispose of surplus material.

- A. Detection Tape: Detection tape shall be buried 12 to 24-inches beneath the ground surface directly over the top of the pipe. The tape will be installed according to the manufacturer's recommendations.
- B. Initial: Place initial backfill material carefully around the pipe above bedding in uniform 6-inch layers to a depth of at least 18-inches above the pipe bell. Compact each layer thoroughly with suitable hand tools. Do not disturb or damage the pipe. Backfill on both sides of the pipe simultaneously to prevent side pressures. Initial backfill material is earth material excavated from the trench which is dry, clean and free of rock, stumps, limbs, man-made waste and other unsuitable material. If materials excavated from the trench are not suitable for use as initial backfill material, obtain suitable materials elsewhere.
- C. Final: After initial backfill material has been placed and compacted, backfill with general excavated material. Final backfill material shall not contain more than 1/3 broken rock, of which no single stone or boulder shall weigh more than 50 pounds. Place backfill material in uniform layers, compacting each layer thoroughly with heavy, power tamping tools of the "Wacker" type, a

hydra-hammer or backhoe.

- D. Settlement: If trenches settle, re-fill and grade the surface to conform to the adjacent surfaces.
- E. Backfill Under Roads: Compact backfill underlying pavement and backfill under dirt and gravel roads to 95 percent of the maximum dry density as determined by the Standard Proctor Compaction Test (ASTM D 698). A minimum of two density tests shall be performed for each sewer lateral and at least every 100 feet when sewer is within pavement, present or proposed.
- F. Backfill Within DOT Right-of-Way: Backfill within the DOT right-of-way shall meet the requirements stipulated in the "Utility Accommodation Policy and Standards", published by the Georgia Department of Transportation.
- G. Select Backfill: Select backfill shall be provided if the indigenous material will not meet the compaction requirements specified elsewhere.

### **3.09 MANHOLES**

Construct manholes as shown on the Standard Details.

- A. Precast Concrete: Handle sections carefully to prevent cracking or chipping. Provide uniform bedding of the bottom section to prevent uneven loading. Install gaskets and joint sealants in accordance with manufacturer's recommendations to produce a watertight structure.
- B. Brick: Bed the bottom and sides of every brick in mortar. Apply a smooth coat of mortar, 3/4-inches thick, on the inside and outside.
- C. Pipe Connections: Seal the void between the pipe and the manhole with rubber boot as shown on the Drawings.
- D. Inverts: Form channels as shown on the Standard Details, rounded, and troweled smooth. Maintain consistent grade through the invert.
- E. Top elevations: Build manholes outside of paved areas to 18-inches above finished grade unless otherwise shown on the Drawings. Build manholes in paved areas to match existing or new pavement elevation.
- F. Drop Connections: Manholes requiring drop connections shall be shown on the

Drawings.

- G. Frames and Covers: Unless frame and cover is to match grade, the frame shall be cast into the cone section.

### **3.10 STREAM AND DITCH CROSSING**

At all points where banks of streams or drainage ditches are disturbed by excavation or where natural vegetation is removed, carefully compact backfill and place filter fabric and rip rap to prevent subsequent settlement and erosion. This requirement applies equally to construction along side a stream or drainage ditch as well as crossing stream or drainage ditch. Place rip rap a distance of not less than 10 feet upstream and 10 feet downstream from any disturbed area. Extend rip rap from 1 foot below streambed to 5 feet past top of bank. Place to conform with the natural slope of the stream bank.

#### **A. Stone Rip Rap**

- 1. Imbed stone rip rap by hand so as to form a compact layer at least 12-inches thick. Place rip rap in such a way that the smaller stones are not segregated but evenly distributed. Place chinking stones in the crevices between the larger stones so that a dense, well graded mass is produced.

- B. Filter Fabric: The filter fabric shall be a monofilament, polypropylene woven fabric meeting the specifications as established by Task Force 25 for the Federal Highway Administration. The filter fabric shall have an equivalent opening size of 70 and shall be manufactured by Mirafi, Amoco, Exxon, or Nicolon. Filter fabric shall be provided for stream and ditch crossings. The fabric shall be overlaid with sand, or crushed stone as necessary due to stream flow, to maximize the contact area between the soil and fabric. Rip rap as specified above shall be placed on top of this fabric and its covering.

### **3.11 CONCRETE PIERS**

Construct piers as shown on the Drawings and in accordance with the following requirements:

- A. Material: Concrete shall have a compressive strength of not less than 3000 psi, with not less than 5.5 bags of cement per cubic yard and a slump between 3 and 5-inches. For job mixed concrete, submit the concrete mix design for approval by the County. Ready-mixed concrete shall be mixed and transported in accordance with ASTM C 94. Reinforcing steel shall conform to the requirements of ASTM A 615, grade 60.

B. Bearing

1. Earth: Where excavation reveals undisturbed earth subsurface, construct piers with spread footing foundations as shown on the Drawings.
2. Rock: Where excavation reveals level or benched rock having a minimum safe bearing value of 20,000 psf, construct piers with foundations bearing directly on rock. Drill a minimum of four holes into the rock under each pier and grout dowels into place to anchor the pier to the rock. Grout holes from the bottom up using a grout pump. Take extreme care to ensure that the entire hole is filled with grout prior to inserting the dowel.

C. Installation: Employ experienced carpenters to construct forms. Build formwork sufficiently strong to resist movement and distortion during pouring and to protect the pier from caving in or lateral movement.

Before placing concrete, dewater the bottom of the hole and clean out all mud, loose earth, and extraneous matter.

Pour concrete as soon as possible after the forms have been approved. Do not leave the excavation open for prolonged periods of time. Protect the excavation from surface water. Do not allow water to accumulate in the excavation or in surrounding areas.

### 3.12 INSPECTION AND TESTING

Clean and test lines before requesting inspection. Where any obstruction is met, clean the sewers by means of rods, swabs, or other instruments. Flush out lines and manholes before inspection.

A. Gravity Sewers: Pipe lines shall be straight and show a uniform grade between manholes. Correct any discrepancies discovered during inspection.

1. Infiltration Tests: Install suitable weirs in manholes selected by the Engineer to determine the leakage of ground water into the sewer. The maximum length of line for each infiltration test shall be 5,000 feet. Measure leakage only when all visible leaks have been repaired and the ground water is 2 feet above the top of the pipe. If leakage in any section of the sewer line exceeds 100 gpd/inch diameter/mile, locate and repair leaks. Repair methods must be approved by the Owner. After repairs are

completed, re-test for leakage.

Furnish, install, and remove the necessary weirs, plugs, and bulkheads required to perform the leakage tests. Where continuous monitoring of flow level is required, the Owner will provide and operate monitoring equipment.

2. Exfiltration Tests: When groundwater is not 2 feet above the pipe use the following method.

a. Low-Pressure Air Test: Prior to air testing, the section of sewer between manholes shall be thoroughly cleaned and wetted. Immediately after cleaning or while the pipe is water soaked, the sewer shall be tested with low-pressure air. At the Contractor's option, sewers may be tested in lengths between manholes or in short sections (25 feet or less) using Air-Lock balls pulled through the line from manhole to manhole. Air shall be slowly supplied to the plugged sewer section until internal air pressure reaches approximately 4.0 psi. After this pressure is reached and the pressure allowed to stabilize (approximately 2 to 5 minutes), the pressure may be reduced to 3.5 psi before starting the test. If a 1.0 psi drop does not occur within the test time, then the line has passed the test. If the pressure drops more than 1.0 psi during the test time, the line is presumed to have failed the test, and the Contractor will be required to locate the failure, make necessary repairs, and retest the line. Minimum test time for various pipe sizes, in accordance with ASTM C 828, as amended to date, is as follows:

<u>Nominal Pipe Size, inches</u>	<u>T (time) Min/100 Feet</u>
8	1.2
10	1.5
12	1.8
15	2.1
18	2.4
21	3.0
24	3.6

Required test equipment, including Air-Lock balls, braces, air hose, air source, timer, rotometer as applicable, cut-off valves, pressure reducing valve, 0-15 psi pressure gauge, 0-5 psi pressure gauge with gradations in 0.1 psi and accuracy of plus or minus 2 percent, shall be provided by the Contractor.

The Contractor shall keep records of all tests made. Copy of such

records will be given to the Owner. Such records shall show date, line number and stations, operator, and such other pertinent information as required by the Owner.

3. PVC Deflection Test: Test PVC gravity sewer for excessive deflection by passing a "pig" through the line with a diameter equal to 95 percent of the nominal inside diameter of the pipe. Excavate and install properly any section of pipe not passing this test. Re-test until results are satisfactory. This test shall be performed within the first 30 days of installation and during final inspection, at the completion of this contract.

For sewers under pavement, the test will be performed after road base compaction but before asphalt is spread.

- B. Force Mains: The Contractor shall furnish, install, and remove all temporary bulkheads, flanges or plugs required to perform the pressure tests and shall furnish all equipment and labor to carry out the tests.

Pressure test force mains at 150 psi measured at the lowest point. Test for a minimum of 2 hours. Leakage shall not exceed 0.12 gph/inch diameter/1000 feet.

If leaks are detected, locate, repair, and re-test. Repair methods must be approved by the Owner.

### **3.13 PROTECTION AND RESTORATION OF WORK AREA**

- A. General: Return all items and all areas disturbed, directly or indirectly by work under these Specifications, to their original condition or better, as quickly as possible after work is started.
- B. Man-Made Improvements: Protect, or remove and replace all fences, piers, docks, walkways, mail boxes, pipe lines, drain culverts, power and telephone lines and cables, and other improvements that may be encountered in the work.
- C. Cultivated Growth: Do not disturb cultivated trees or shrubbery unless approved by the Owner. Any such trees or shrubbery which must be removed shall be heeled in and replanted under the direction of an experienced nurseryman.
- D. Cutting of Trees: Do not cut trees for the performance of the work except as absolutely necessary. Protect trees that remain in the vicinity of the work from damage from equipment. Do not store spoil from excavation against the trunks. Remove excavated material stored over the root system of trees within 30 days to allow natural watering of the root system. Repair any damaged tree over 3-inches in diameter. All trees and brush that require removal shall be promptly and completely removed from the work site and disposed of by the Contractor. No

stumps, wood piles, or trash piles will be permitted on the work site.

- E. Grassing: Replant grass removed or damaged in residential areas using the same variety of grass and at the first appropriate season. Outside of residential areas, plant the entire area disturbed by the work in rye, fescue, bermuda, clover or other suitable ground cover on completion of work in any area. In all areas, promptly establish successful stands of grass.
- F. Erosion Control: Plan excavation work to prevent erosion and the washing of soil into adjacent streams. Limit the amount of open excavation at any one time. Place spoil in the proper place and keep natural water routes open.
- G. Disposal of Rubbish: Dispose of all materials cleaned and grubbed during the construction of the project in accordance with the applicable codes and rules of the appropriate regulatory agencies.

**END OF SECTION**



**SECTION 02734**  
**PIPEBURSTING SANITARY SEWER REPLACEMENT**

**PART 1 - GENERAL**

**1.02 WORK THIS SECTION**

- A. This section describes the replacement of existing sanitary sewer line thru the use of the trenchless construction technique of pipebursting.

**1.03 REFERENCES**

- A. **CODES, SPECIFICATIONS AND STANDARDS**  
American National Standards Institute (ANSI)
- B. Testing and Material Standards  
American Society of Testing and Materials (ASTM)
- C. Rockdale County Department of Water Resources Water and Wastewater Standards and Specifications
- D. General Conditions for Rockdale County Construction Contracts, Rockdale County

**1.04 QUALIFICATIONS**

- A. Certification
  - 1. The licensee shall be certified by the pipe bursting system manufacturer.
  - 2. The Contractor shall employ certified thermal butt-fusion equipment operators.
- B. Training: Polyethylene pipe jointing shall be performed by personnel trained in the use of thermal butt-fusion equipment and recommended methods for new pipe connections. Personnel directly involved with installing the new pipe shall receive training in the proper methods for handling and installing the polyethylene pipe. Training shall be performed by a qualified representative.
- C. All pipe bursting contractors shall have a minimum of 4-years of experience with the pipe bursting method and shall have a minimum of 25,000-feet of water or sewer pipe bursting experience. Specific projects and contact details with dates projects performed must be submitted and verifiable with all bid packages.

## **1.05 DEFINITIONS (NONE CITED)**

### **1.06 SUBMITTALS**

- A. Design calculations signed and sealed by the Contractor's professional engineer. These calculations must address the site-specific conditions affecting the pipe burst process. The calculations must address the installation loads, equipment requirements, pipe material/thickness, and flow characteristics of the pipe to be installed.
- B. Certification that the Contractor is licensed by the Pipe Bursting system manufacture as an installer of their system.
- C. Drawing showing location, sizes, depth, method of excavation, shoring, and bracing for the insertion and receiving pits.
- D. Drawing showing location, sizes and construction methods for the service reconnection pits.
- E. Manufactures' instructions for handling, storage and repair of pipe and fittings.
- F. Procedures and materials for service reinstatement including time and duration of sewer service unavailability.
- G. Submit test reports and television inspection videos.
- H. Preconstruction and post-construction of the pipe installed shall be video taped and provided to the County. No separate payment shall be made for construction videotape. All costs for video inspection of the pipe shall be included in the pipe reconstruction item.

### **1.07 PRODUCT DELIVERY, STORAGE, AND HANDLING**

- A. The Contractor shall inspect pipe materials and couplings upon arrival at the job site.
- B. The Contractor shall handle and store pipe materials to protect them from damage due to weather, impact, shock, shear, or free fall. The Contractor shall not roll pipe unrestrained from delivery trucks.
- C. The Contractor shall use mechanical means to move or handle pipe. The Contractor shall employ acceptable clamps, rope, or slings around the outside barrel of pipe and couplings.
- D. If new pipe and fittings become damaged before or during installation, it shall be repaired as recommended by the manufacturer or shall be replaced as required by the County at the Contractor's expense.

## **1.08 MEASUREMENT AND PAYMENT**

- A. Payment for insertion pit shall be made at the unit price bid. Payment will be full compensation for furnishing all labor, materials, supplies, transportation, traffic control and equipment, etc. necessary to perform all work. Payment for insertion pit shall be made under Pipe Bursting – Full Length, Depth of Pit, Type of Insertion Pipe, per each.
- B. Payment for receiving pit shall be made at the unit price bid. Payment will be full compensation for furnishing all labor, materials, supplies, transportation, traffic control and equipment, etc. necessary to perform all work. Payment for receiving pit shall be made under Pipe Bursting – Full Length, Depth of Sewer Main, Type of Insertion Pipe, per each.
- C. Payment for pipe bursting shall be made at the unit price bid. Pipe bursting shall be measured by linear foot of sewer line from center of the upstream manhole to center of the downstream manhole. Payment will be full compensation for furnishing all labor, materials, supplies, transportation, traffic control and equipment, etc. necessary to perform all work. Payment for pipe bursting shall be made under Pipe Bursting – Full Length, Depth of the Sewer Main, Type of Insertion Pipe, Size of Existing Pipe to Size of Insertion Pipe, per linear foot.
- D. Payment for priority repair (work completed within 48-hours) shall be made at the unit price bid. Payment will be full compensation for completing the requested work within 48 hours of receiving notification from the County. Payment shall be made under Fee for Priority Repair, per each.
- E. Separate payment will not be made for asset management. The cost of asset management must be included in other unit cost.

## **PART 2 PRODUCTS**

### **2.01 GENERAL**

- A. The pipe bursting method shall be as provided by industry standards and installed by approved and licensed installers. No other methods shall be allowed.

### **2.02 PIPE MATERIALS**

- A. All materials used in the trenchless replacement of sanitary sewers shall be new, and unused, and shall be of the sizes and types indicated on the Plans.
- B. Ductile iron pipe shall be “bell-less” MT or OS push pipe and shall be manufactured in strict compliance with the required standards and the latest revision of ANSI, AWWA, and ASTM and furnished in minimum 4’ - 8-foot lengths unless otherwise approved.

- C. High Density Polyethylene (HDPE) in strict compliance with ASTM F714 polyethylene plastic pipe (SDR-PR) based on outside diameter. The pipe shall be homogeneous throughout and shall be free of visible cracks, holes, foreign material, blisters, and other deleterious faults. At a minimum the HDPE shall be ductile iron pipe size (DIPS) DR 17 furnished in minimum 40-foot lengths unless otherwise approved.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

- A. All activities shall be performed in accordance with the manufacturer's recommendations and regulations established by OSHA. Particular attention shall be drawn to those safety requirements involving working with scaffolding and entering confined spaces.
- B. The Contractor shall identify the locations of all underground utilities prior to commencing excavation activities. The Contractor shall consult with utility companies to verify the locations of underground utilities.
- C. The Contractor shall notify the agency, or company owning any utility line that is damaged, broken, or disturbed. The Contractor shall obtain approval from the County and the utility County prior to performing any temporary or permanent repairs, or relocation of utilities.
- D. The Contractor shall limit his work area to the minimum required to perform the Work.
- E. Pipe bursting operations shall be conducted in accordance with the recommendations of the manufacturer.
- F. The Contractor shall notify the railroad company, Georgia Department of Transportation, or any other utility affected prior to beginning any work so that said utility may have a representative present if desired.
- G. The Contractor shall be responsible for securing information pertaining to the subsurface geology of the area and using this information to select equipment and determine practicality of the trenchless pipe replacement.
- H. The Contractor shall perform pre-television inspection to locate all active service line connections. All service connections shall be noted and brought to the attention of the County.
- I. If during pre-television inspection, the Contractor identifies a sag in the existing main, the Contractor shall notify the County. The County will determine whether point repairs are needed prior to pipe bursting sewer sections. The Contractor will not perform point repairs without prior approval from the County.

### **3.02 PIT INSTALLATION**

- A. The Contractor shall design the excavation, support system, and furnish and install all materials and equipment required to construct complete insertion and receiving pits, as indicated on the Plans, or as directed by the County.
- B. The Contractor shall ensure conformance with all Federal, State, and Local Safety Laws, regulations and ordinances.

### **3.03 PIPE INSTALLATION PROCEDURE**

- A. The Contractor shall install the pipe bursting system in accordance with the manufactures' specifications and as approved by the County.
- B. The existing pipe will be replaced with the same size or larger pipe as approved by the County in the submittal documents.
- C. The pipe-bursting tool shall be a suitable size to crack and break out the existing sewer pipe.
- D. The amount of force used to jack the pipe and/or bursting tool shall not exceed the rated thrust capacity of the replacement pipe.
- E. Each piece of pipe and special fittings shall be carefully inspected before it is installed, and no defective pipe shall be placed in the insertion pit.
- F. Equipment used to perform the work shall be located away from buildings to avoid noise impact. Provide a silent engine compartment with the winch to reduce machine noise as required to meet local requirements. The Contractor shall install all pulleys, rollers, and bumpers. Alignment control devices and other equipment required to protect existing manholes and also to protect the pipe from damage during installation. Lubrication may be used as recommended by the manufacturer. Under no circumstances will the pipe be stressed beyond its elastic limit. Winch line is to be centered in pipe to be burst with adjustable boom. Sufficient excess length of new pipe, but not less than four (4) inches shall be allowed to protrude into the manhole to provide for occurrence. Following the relaxation period, the annular space may be sealed in such a manner as to form a smooth watertight seal.

### **3.04 PIPE JOINING**

- A. The polyethylene pipe shall be assembled and joined at the site using the butt-fusion method to provide a leak proof joint. Threaded or solvent-cement joints and connections are not permitted. All equipment and procedures used shall be used in strict compliance with the manufacturer's recommendations. Personnel certified as fusion technicians by a manufacturer of polyethylene pipe and/or fusing equipment shall accomplish fusing.

- B. The butt-fuse joint shall be true alignment and shall have uniform rollback beads resulting from the use of proper temperature and pressure. The joint shall be allowed adequate cooling time before removal of pressure. The fused joint shall be watertight and shall have tensile strength equal to that of the pipe. All joints shall be subject to acceptance by the County prior to insertion. All defective joints shall be cut out and replaced at no cost to the County. Any section of the pipe with a gash, blister, abrasion, nick, scar, or other deleterious fault greater in depth than ten percent (10%) of the wall thickness, shall not be used and must be removed from the site. However, a defective area of the pipe may be cut out and the joint fused in accordance with the procedures stated above. In addition, any section of the pipe having other defects such as concentrated ridges, discoloration, excessive spot roughness, pitting, variable wall thickness or any other defect of manufacturing or handling as determined by the County shall be discarded and not used.
- C. All joints shall be made available for inspecting by the County before insertion. The replacement pipe shall be joined in the insertion pit in appropriate working lengths in strict conformance with pipe manufactures' recommendations.

### **3.05 LOW PRESSURE AIR TESTING**

- A. All full-length pipe burst sewer mains will be air tested per the Rockdale County Department of Water Resources Water and Wastewater Standards and Specifications including the following:
  - 1. A representative of the County shall observe the test.
  - 2. It shall be the Contractor's responsibility to determine the ground water level.
  - 3. The test will be conducted after the connection of all service laterals.
- B. All safety precautions specified in the Rockdale County Department of Water Resources Water and Wastewater Standards and Specifications will be followed.
- C. Provide a safety release device set to release at 10 psi between the air supply and the sewer under test.

### **3.06 SERVICE LATERAL CONNECTIONS**

- A. All existing service laterals shall be connected to the new sewer main.
- B. Service laterals shall not be reconnected to the new sewer main until the sewer main has had sufficient time to relax.

### **3.07 DOCUMENTATION**

- A. The Contractor shall complete work on each asset as assigned via the County's Computerized Work Order Management system. Upon start of work, the Contractor shall receive work orders as assigned by the Project Manager. The Contractor shall utilize the Mobile Work Manager to maintain and synchronize the status of each rehabilitation work order issued.

### **3.08 TELEVISION INSPECTION**

- A. All new sewers and full-length pipe replacements shall be television inspected.
- B. The Contractor shall provide television equipment capable of properly documenting the conditions as found within the lateral. The camera equipment shall be capable of launching into the full length of each lateral and providing an accurate documentation of the lateral to be lined. Lighting for the camera shall illuminate the entire periphery of the lateral.
- C. Both a pre-lining and post-lining inspection shall be submitted to the County for approval. The Contractor shall launch into each lateral connection on both pre and post tape.
- D. All inspections shall be submitted following the standards and formats as outlined in SSR 1\_Sanitary Sewer Television-Sonar Inspection warranty.

### **3.9 WARRANTY**

- A. The Contractor shall guarantee his work for a warranty period of one (1) year from the date of acceptance. If, at anytime during the warranty period, any leakage, cracking, loss of bond, or other discontinuity is identified, the Contractor shall make repairs at no additional cost to the County.

END OF SECTION

**SECTION 02740**  
**Bypass Pumping/Wastewater Flow Control**

**PART 1 GENERAL**

**1.01 SCOPE**

- A. The purpose of this section is to define the various methods of wastewater flow control including plugging/blocking and bypass/diversion pumping. Wastewater flow control shall maintain an efficient and uninterrupted level of service to the sewer system while investigative or construction operations (including rehabilitations, repair or replacement) are performed.

**1.02 REFERENCES**

- A. Codes, Specifications and Standards (None cited)
- B. Testing and Materials Standards (None Cited)
- C. Rockdale County Water Resources Water and Wastewater Standards and Specifications
- D. General Conditions for Rockdale County Construction Contracts, Rockdale County

**1.03 DEFINITIONS (None Cited)**

**1.04 QUALIFICATIONS**

- A. Qualification documentation will be submitted as a part of all Requests for Proposals and Prequalifications.
- B. The Contractor must meet all of the following criteria to be considered qualified to propose and/or bid on the subject contract:



1. The Contractor, or their subcontractor, must document that they, not their parent company or related company or the experience of an individual/s, have been in this line of business a minimum of five (5) years.
2. The Contractor, or their subcontractor, must document that they, not their parent company or related company or the experience of an individual/s, have performed gravity sewer bypass/diversion pumping for the sizes of sewer mains and flows expected under this contract in the past two (2) years. This documentation shall include locations, references (including names and phone numbers), pipe sizes, pump sizes and pumping rates. This documentation must include a minimum of ten (10) different projects and must cover the range of sizes of sewer mains and flows expected under this contract.

#### **1.05 EXPERIENCE**

- A. Experience documentation will be submitted as a part of all Requests for Proposals and Prequalifications. The Contractor shall provide the County with written documentation that the supervisor and field crew leaders responsible for this work have received the proper training, are certified, and have the requisite experience. This documentation will include dates of hands-on experience, employer, description of duties/experience, contact name and phone number. Documentation on any person shall not be longer than 1-page.
- B. Supervisor of the field crews must be properly trained in this function and have a minimum of five (5) years experience in performing gravity sewer bypass/diversion pumping including safe working practices, the types of equipment and the operation of the equipment that will be used for this contract.

- C. Field crew leaders must be properly trained in the function and have a minimum of three (3) years hands-on experience in performing bypass/diversion pumping including safe working practices, the types of equipment and the operation of the equipment that will be used for this contract. No crewmembers shall enter confined spaces without the necessary certified training.

**1.06 PERSONNEL**

- A. The Supervisor must daily visit the project site checking on their personnel and subcontractors, meeting with the field crew leaders as well as checking on the status and progress of the project.
- B. A field crew leader must be with their crew when their crew is working. Each field crew leader can only have one crew. Each crew must have it's own field crew leader.

**1.07 SUBMITTALS**

- A. Seven (7) calendar days prior to any bypass/diversion pumping activity the Contractor shall submit six (6) copies of the complete and detailed plan to the County for review. The bypass system shall meet the requirements of all codes and regulatory agencies having jurisdiction. The Contractor may submit a general bypass/diversion pumping plan that will be used when bypassing sewer mains 8-inch diameter and smaller. Once the Contractor has received written approval from the County for this 8-inch diameter and smaller sewer main plan the Contractor may use that plan without re-submittal.
- B. The bypass/diversion pumping plan submittal shall have sufficient detail to show the following:
  - 1. Lowest overflow point upstream of the bypass/diversion.
  - 2. Pump stations upstream of the bypass/diversion.
  - 3. Staging area for pumps
  - 4. Sewer plugging method and types of plugs
  - 5. Number, size, material, location and method of installation of suction piping
  - 6. Number, size, material, location and method of installation of discharge piping

7. Bypass pump sizes, capacity, number of each size to be onsite and the power requirements
  8. System curve design calculations detailing the static lift, friction losses, velocity losses and flow velocities.
  9. Pump curves with the system curves plotted showing the pump operation range and confirming the pump size, horsepower and impeller required
  10. Standby power generator size and location, if utilized
  11. Noise control and abatement measures
  12. Downstream discharge plan including pipe routing plan and profile views
  13. Sections showing suction and discharge pipe depth, embedment, joint restraints, thrust blocking and backfilling
  14. Method of protecting discharge manholes or structures from erosion and damage
  15. Location and position, in detail, where pipes cross roadways and driveways
- C. For bypass plans associated with twelve (12) inch or larger sewer mains a Professional Engineer must sign and seal the bypass/diversion plan.
- D. The Contractor will provide an emergency response plan for each bypass/diversion pumping. The plan will be followed in the event of failure of the bypass/diversion pumping system.
- E. The Contractor must identify all pump stations and the lowest overflow point upstream of the plugging/block and/or bypass/diversion pumping. The Contractor may be required to station personnel at upstream pump stations and overflow points.
- F. The Contractor shall notify the County 48 hours prior to commencing any plugging/block and/or bypass/diversion pumping.

## **1.08 MEASUREMENT AND PAYMENT**

- A. No separate payment will be made for the wastewater flow control method of plugging/blocking. The work and materials being considered as incidental to and part of other unit bid prices.
- B. No separate measurement or payment will be made for the wastewater flow control associated with cured-in-place pipe (CIPP). The work and materials being considered as incidental to and part of CIPP unit prices.
- C. No separate measurement or payment will be made for Contractor personnel that may be required to monitor pump stations and/or overflow points upstream of any plugging/block and/or bypass/diversion pumping. The work, materials and personnel being considered as incidental to plugging/blocking operations and bypass/diversion pumping unit prices.
- D. Payment for bypass/diversion pumping shall be made at the unit price bid. Bypass/diversion pumping shall be measured by the following methods and payment will be full compensation for furnishing all labor, tools, fuels, maintenance, traffic control, and equipment necessary to perform all work:
  - 1. Payment for bypass pump setup shall be made under Pump Size (inches), Bypass Pump Setup, per each.
  - 2. Payment for bypass pump discharge line shall be made under Discharge Line, Pump Size (inches), Bypass Pump, per linear foot.
  - 3. Payment of bypass pump operation shall be made under Operation, Pump Size (inches), Bypass Pump, per hour.

## **PART 2 PRODUCTS**

### **1.01 PIPE FOR FLOW DIVERSION**

- A. Steel pipe is permitted for flow diversion.

- B. Polyethylene Pipe is permitted for flow diversion. Polyethylene material shall comply with the requirements for Type III polyethylene, C-S and P-34 as tabulated in ASTM D-1248 and has the Plastic Pipe Institute recommended designation PE3406. The material shall also have an average specific base resin density of between 0.94 g/cc and 0.955 g/cc (ASTM D-1505). Pipe made from these resins must have a long-term strength (50 years) rating of 1,250 psi or more per hydrostatic design basis categories of ASTM D-2837. The polyethylene resin shall contain antioxidants and be stabilized against ultraviolet degradation to provide protection during processing and subsequent weather exposure. The polyethylene resin shall have an environmental stress crack resistance; condition C as shown in ASTM D-1693, to be greater than 500 hours, 20% failure. All pipes shall be made from virgin quality material. No rework compound, except that obtained from the manufacturer's own production of the same formulation shall be used. The polyethylene resin shall have an average melt flow index, condition E as shown in ASTM D-1238, not in excess of 0.25 g/10 mm. Pipe shall be homogeneous throughout, and free of visible cracks, holes, foreign material, blisters, or other deleterious faults. Diameters and wall thickness shall be measured in accordance with ASTM D-2122. Pipe joining will be done by thermal butt fusion method in accordance with ASTM D-2657.
- C. Polyvinylchloride (PVC) pipe is permitted for flow diversion. PVC pipe shall be rigid and securely coupled with a minimum number of connections. Glued PVC is not allowed.
- D. Irrigation type piping is not allowed.
- E. No more than two (2) pump discharge hoses will be allowed at any given time. The length of these hoses shall be limited at the direction of the County.
- F. The Contractor, at a minimum, shall design all piping, joints and accessories to withstand twice the maximum operating pressure or 100 psi whichever is greater.
- G. If required the Contractor must provide air relief (air relief valves, etc) on bypass/diversion pumping discharge piping to insure proper operation.

## **PART 3 - EXECUTION**

### **1.01 GENERAL**

- A. Prior to commencing each bypass/diversion pumping activity the Contractor must receive written approval from the County.
- B. Ensure all levels of sewage flow are continuously and effectively handled.
- C. The Contractor shall use ingenuity and skill to develop a bypass/diversion pumping plan.
- D. The back-up pump, appropriate piping, fuel, lubrication and spare parts shall be incorporated into the bypass/diversion pumping arrangement at the site, ready for use in case of a breakdown.
- E. At no cost to the County, the Contractor will carry out a “trial run” of the bypass/diversion arrangement on all sewers greater than 12-inches. This trial run must be conducted before the County will accept the arrangement. The “trial run” shall demonstrate the incorporation of all standby equipment to handle flows when the main pump set is switched off.
- F. All materials used for bypass/diversion pumping shall be pre-approved by the County prior to commencing pumping activities.
- G. When wastewater flows at the upstream manhole of the sewer main being televised are above the maximum allowable requirements for television inspection, or do not allow the proper sewer or manhole repair, the flows shall be reduced to the levels required by one of the following methods: plugging/blocking or bypass/diversion pumping of the flows, as approved by the County.
- H. In some applications, the wastewater flow may be plugged/blocked and contained within the capacity of the collection system. This shall only be done when it has been determined by the Contractor and approved by the County that the system can accommodate the surcharging without any adverse impact.

- I. When a sanitary sewer is being rehabilitated or replaced, the Contractor, at his own expense and at no cost to the County, shall provide and maintain temporary outlets and connections for all private or public service laterals connected to or served by the sewer main being rehabilitated or replaced, and where necessary, shall provide adequate pumping facilities; and shall maintain these services until such time as the permanent sewers and connections are installed and in service.
- J. During construction, flows in sections of the existing sewer being rehabilitated by removal and replacement shall be accommodated by plugging/blocking or bypass/diversion pumping.
- K. The plan must keep the wastewater flowing without discharge or spills into any adjacent creeks or on to the ground. The Contractor will seek and obtain inspection of each section of newly laid sewer before removing the flow diversion from service and placing the newly installed or rehabilitated section into service.
- L. In sections of the existing sewer being rehabilitated by laying a new line parallel to the existing sewer, the existing sewer may be used to accommodate the existing flow, and no bypass/diversion pumping will be necessary if the existing sewer is not damaged or its use restricted by the Contractor's operations.
- M. All pipe materials utilized in wastewater flow control shall be in good condition, and free of defects, and leaks. The Contractor at no cost to the County shall replace any defective material. Upon completion of the job, wastewater flow control materials shall be removed from the site.

## **1.02 DEPTH OF FLOW**

- A. In performing television inspection, joint testing, and/or sealing and other sewer rehabilitation work, the Contractor shall control the depth of flow in the sewer within the following guidelines:

### Maximum Pipe Flow Depth

Television Inspection		Joint Testing and Sealing	
Pipe Size	% Pipe Dia.	Pipe Size	% Pipe Dia.
6"-12"	10	6"-12"	20
15"-24"	10	15"-24"	25
27" or larger	10	27" or larger	30

- B. When sewer line flows, as measured in the first manhole upstream of the sewer segment being rehabilitated, exceed the maximum depth listed above or inspection of the complete pipe periphery is necessary for effective testing, sealing, or line work, the Contractor shall implement wastewater flow control methods. The implementation of the flow control method shall be reviewed and approved by the County.

### 1.03 PLUGGING AND BLOCKING

- A. The Contractor shall insert a sewer line plug into the line at a manhole upstream from the section being inspected or repaired. The plug shall be so designed that all or any portion of the operation flow can be released. Flows shall be shut off or reduced to within the maximum flow limits specified. Wastewater flow shall be restored to normal following completion of work.

### 1.04 BYPASS/DIVERSION PUMPING

- A. When bypass/diversion pumping is required, a pump size shall be recommended by the Contractor and approved by the County. The Contractor shall supply the necessary pumps, conduits, and other equipment to divert the flow of wastewater around the sewer section in which the work is to be performed. The bypass system shall be of sufficient capacity to handle existing flows plus additional flow that may occur during periods of rainstorms as indicated from the flow monitoring program. The Contractor shall be responsible for furnishing the necessary labor and supervision to set up and operate the pumping and bypassing system. A "setup" consists of the necessary pumps, conduits, and other equipment required to divert the flow of wastewater from the start to finish of work performed.



- B. Wastewater shall be pumped directly into the nearest available downstream manhole, provided that the existing sewer has capacity to transport the flow. The Contractor shall request the County to determine the capacity of the downstream existing system. The Contractor shall request this determination fourteen (14) calendar days prior to the planned bypass/diversion pumping.
- C. The Contractor shall be responsible for keeping the pumps running continuously 24 hours a day, if required, until the bypass operation is no longer required. The Contractor shall have standby pumps at all times.
- D. Maintenance personnel capable of starting, stopping, refueling, and maintaining the pumps and equipment during the bypass/diversion pumping operation shall continuously monitor pumps and equipment. If pumping is required on a 24-hour basis, engines shall be equipped in a manner to keep noise to a minimum.

#### **1.05 FLOW CONTROL PRECAUTIONS**

- A. Where the wastewater flow is plugged/blocked, the Contractor shall be responsible for taking sufficient precautions to protect public health. The sewer lines shall also be protected from damage. The following shall apply:
  - 1. No wastewater shall be allowed to back up into any homes or buildings.
  - 2. No wastewater shall overflow any manholes, cleanouts, or any other outlet.
  - 3. Customers upstream of the flow control area shall be able to use all their water and sewer utilities without interruption.
  - 4. If any of the above occur or are expected to occur, the Contractor shall provide bypass/diversion pumping to alleviate one or all of the conditions. Additionally, the Contractor shall observe the conditions upstream of the plug and be prepared to immediately start bypass/diversion pumping, if needed.
- B. Any sump pumps, bypass pumps, trash pumps, or any other type of pump, which pulls wastewater or any type of material out of the manhole or sewer, shall discharge the material into another manhole, or appropriate vehicle or container approved by the County. **Under no circumstances shall this material be discharged, stored, or deposited on the ground, swale, road, or open environment.**

- C. The Contractor shall take appropriate steps to ensure that all pumps, piping, and hoses that carry raw wastewater are protected from traffic. Traffic control shall be performed in accordance with the requirements of the governing agency.
- D. Prior to any wastewater flow control operations the Contractor will identify the pump station/s and lowest overflow point upstream of the planned plugging/blocking or bypass/diversion. During operations the Contractor will monitor the pump stations and lowest points to ensure overflow does not occur.
- E. In the event, during any form of “Wastewater Flow Control,” that raw wastewater is spilled, discharged, leaked, or otherwise deposited in the open environment the Contractor shall be responsible for any cleanup of solids and stabilization of the area affected. This work shall be performed at the Contractor’s expense with no additional cost to the County. The Contractor shall also be responsible for notifying the County’s sewer system maintenance personnel and complying with any and all regulatory requirements for cleaning up the spill at no additional cost to the County.
- F. During wastewater flow control operations; the Contractor shall take proper precautions to prevent damage to existing sanitary sewer facilities, flooding, or damage to public or private property.
- G. The Contractor shall make repairs, replacements or rebuilds, as directed by the County, to any portion of the sewer system damaged during any plugging or bypass/diversion pumping operation. All such repairs, replacements, and rebuilding shall be paid for by the Contractor.
- H. The Contractor shall make such provisions as are necessary for handling all flows in existing sewers, connections, and manholes by pipes, flumes, or by other approved methods at all times, when his operations would, in anyway, interfere with normal functioning of those facilities.
- I. The Contractor shall be responsible for the removal of any debris and sedimentation in the existing sewers, laterals, and manholes, etc., which is attributable to his work under this Contract. The Contractor is responsible for the proper disposal of these items.

- J. The Contractor in strict accordance with OSHA and any applicable local safety requirements shall perform all operations. Particular attention is directed to safety regulations for excavations and entering confined spaces.
  
- K. It is the Contractor's responsibility to notify in writing any property owner and/or resident having a sewer service connection on the sewer being rehabilitated or replaced. The Contractor shall notify property owners 24 to 72 hours prior to commencing sewer rehabilitation or replacement. The Contractor shall be solely responsible for any damage caused by property service connection backups caused by the sewer rehabilitation operations.

END OF SECTION

**SECTION 02741  
SEWER LINE CLEANING**

**PART 1 GENERAL**

**1.01 WORK THIS SECTION**

- A. Sewer line cleaning to remove foreign materials and debris from the mains and restore the pipe to a minimum of 95% of the though flow channel and cross section, for clear viewing of the interior surfaces of the lines during television inspection, or as required for other specified rehabilitation.

**1.02 REFERENCES**

- A. Codes, Specifications, and Standards  
NASSCO – National Association of Sewer Service Companies
- B. Testing and Materials Standards (None Cited)
- C. Rockdale County Water Resources Water and Wastewater Standards and Specifications
- D. General Conditions for Rockdale County Construction Contracts, Rockdale County

**1.03 DEFINITIONS (None Cited)**

**1.04 QUALIFICATIONS**

- A. Qualification documentation will be submitted as a part of all Requests for Proposals and Prequalifications.
- B. The Contractor must meet all of the following criteria to be considered qualified to propose and/or bid on the subject contract:
  - 1. The Contractor, or their subcontractor, must document that they, not their parent company or related company or the experience of an individual/s, have been in this line of business a minimum of three (3) years.
  - 2. The Contractor, or their subcontractor, must document that they, not their parent company or related company or the experience of an individual/s, have cleaned a minimum of 250,000 linear feet of sewer mains of the sizes involved for this contract in the past two (2) years. This documentation shall include locations, references (including names and phone numbers), pipe sizes and linear footages of those sizes.

**1.05 EXPERIENCE**

- E. Experience documentation will be submitted as a part of all Requests for Proposals and Prequalifications. The Contractor shall provide the County with written

documentation that the supervisor and field crew leaders responsible for this work have received the proper training, are certified, and have the requisite experience. This documentation will include dates of hands-on experience, employer, description of duties/experience, contact name and phone number. Documentation on any person shall not be longer than 1-page

- F. Supervisor of the field crews must be properly trained in this function and have a minimum of three (3) years experience in performing sanitary sewer cleaning including safe working practices, proper cleaning procedures, and experience in the types of cleaning equipment that will be used for this contract.
- G. Field crew leaders must be properly trained in this function and have a minimum of three (3) years hands-on experience in performing sewer cleaning including safe working practices, proper cleaning procedures, and experience in the types of cleaning equipment that will be used for this contract.
- H. No crewmembers shall enter confined spaces without the necessary certified training.

#### **1.06 PERSONNEL**

- A. The Supervisor must daily visit the project site checking on their personnel and subcontractors, meeting with the field crew leaders as well as checking on the status and progress of the project.
- B. A field crew leader must be with their crew when their crew is working. Each field crew leader can only have one crew. Each crew must have its own field crew leader.

#### **1.07 MEASUREMENT AND PAYMENT**

- A. Payment for cleaning shall be made at the unit price bid. Sewer main pipe cleaning shall be measured by linear foot of pipe from center of the upstream manhole to center of the downstream manhole. Payment will be full compensation for furnishing all labor, tools, and equipment necessary to perform all work. Payment for pipe cleaning shall be made under Sewer Pipe Cleaning, Light, Heavy or Specialty Cleaning, Pipe Diameter (size) per linear foot.
- B. No separate payment will be made for cleaning when that cleaning is associated with the installation of cured-in-place-pipe (CIPP). The work and materials being considered as incidental to and part of the CIPP unit bid prices. Contractor will be required to submit both a Pre-Lining and Post-Lining inspection, and these inspections must comply with the same technical standards and specifications as all CCTV Condition Assessment surveys.

## **PART 2 - PRODUCTS**

### **1.01 GENERAL**

- A. The Contractor shall provide all supervision, labor, material, supplies, equipment, transportation, traffic control, etc., necessary to satisfactorily clean the sewer main(s).
- B. **Hydraulically Propelled Equipment:** The equipment used shall be of a movable dam type and be constructed in such a way that a portion of the dam may be collapsed at any time during the cleaning operation to protect against flooding of the sewer. The movable dam shall be equal in diameter to the main being cleaned and shall provide a flexible scraper around the outer periphery to insure removal of grease. If sewer cleaning balls or other equipment, which cannot be collapsed, are used, special precautions to prevent flooding of the sewers and public or private property shall be taken.
- C. **High-Velocity Jet (Hydrocleaning) Equipment:** All high-velocity sewer cleaning equipment shall be constructed for ease and safety of operation. The equipment shall have a selection of two or more high-velocity nozzles. The nozzles shall be capable of producing a scouring action from 15 to 45 degrees in all size mains designated to be cleaned. Equipment shall also include a high-velocity gun for washing and scouring manhole walls and floor and produce at least 2000-psi pressure. The gun shall be capable of producing flows from a fine spray to a solid stream. The equipment shall carry its own water tank, auxiliary engines, pumps, and hydraulically driven hose reel.
- D. **Mechanically Powered Equipment:** Bucket machines shall be in pairs with sufficient power to perform the work in an efficient manner. Machines shall be belt operated or have an overload device. Machines with direct drive that could cause damage to the main will not be allowed. A power rodding machine shall be either a sectional or continuous rod type capable of holding a minimum of 500 feet of rod. The rod shall be specifically heat-treated steel. To insure safe operation, the machine shall be fully enclosed and have an automatic safety clutch or relief valve.
- E. The flow of sewage in the sewer mains shall be utilized to provide the necessary pressures for hydraulic cleaning devices whenever possible. 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. The Contractor's truck/trailer must be permitted by the County as having the proper backflow prevention devices. The County will supply a meter that must be connected to the fire hydrants prior to the withdrawal of water to document all water usage by the Contractor. The Contractor will be required to record daily meter readings at the beginning and ending of each workday and provide these readings to the County representative with each pay request. The Contractor will not be charged any fees for the use of the meter nor for any water used in the execution of this work unless otherwise indicated. No fire hydrant shall be obstructed in case of a fire in the

area served by the hydrant. No additional payment to the Contractor shall be required use of the meter or the documentation of water used. The Contractor shall be responsible for providing all other necessary hoses and tools for obtaining the water.

## **PART 3 - EXECUTION**

### **1.01 GENERAL**

- A. **Cleaning Precautions:** During cleaning operations, satisfactory precautions shall be taken in the use of cleaning equipment. When hydraulically propelled cleaning tools (which depend upon water pressure to provide their cleaning force) or tools which retard the flow in the sewer main are used, precautions shall be taken to insure that the water pressure created does not damage or cause flooding of public or private property being served by the pipe.
- B. **Cleaning:** The designated manhole sections shall be cleaned using hydraulically propelled, high-velocity jet, or mechanically powered equipment. Selection of the equipment used shall be based on the conditions of pipes at the time the work commences. The equipment and methods selected shall be satisfactory to the County. The equipment shall be capable of cleaning a minimum of 1500' linear feet and of removing dirt, grease, rocks, sand, and other materials and obstructions from the pipes and manholes. If cleaning of an entire section cannot be successfully performed from one manhole, the equipment shall be set up on the other manhole and cleaning again attempted. If, again, successful cleaning cannot be performed or the equipment fails to traverse the entire manhole section, it will be assumed that a major blockage exists and the cleaning effort shall be repeated with other types of equipment.
- C. The term "clean" as used herein shall mean the complete removal of all garbage, dirt, gravel, rocks, roots, grease, settled sludge and all other solid or semi-solid materials from the pipes and manholes.
  - 1. Light Cleaning is defined as cleaning of a pipe that has an average depth of foreign material and debris equal to no more than 25% of the diameter of the main over the length of the manhole-to-manhole section. Rocks should be smaller than 3" in diameter.
  - 2. Heavy Cleaning is defined as cleaning of a pipe that has an average depth of foreign material and debris equal to more than 25% of the diameter of the main over the length of the manhole-to-manhole section. Rocks should be larger than 3" in diameter. If a pipe is encountered which requires heavy cleaning, the Contractor shall notify the County of the problem before commencing work.
  - 3. As part of both Light and Heavy Cleaning, the Contractor shall scour debris or grease-laden manhole walls with high velocity water gun. No additional cost will be paid for such scour.

4. Specialty Cleaning is defined as cleaning of a pipe that has heavy accumulation of roots and/or heavy accumulation of grease, large diameter rocks and/or debris and requires the use of bucketing and/or rodding methodologies to clean.
- D. Conditions such as broken main and major blockages may prevent cleaning from being accomplished, especially where additional damage would result if cleaning were attempted, or continued. Should such conditions be encountered, the Contractor shall not be required to clean those specific main sections unless the county removes the apparent obstruction.
  - E. Whenever mains to be cleaned show evidence of being more than one-half filled with solids, bucket machines and/or rodding machines shall be utilized to remove the major portion of the material before hydraulic equipment or high velocity, hydro-cleaning equipment is brought into use for finishing the cleaning work.
    1. When bucket machines are used, the bucketing process shall be done in one main section at a time. A bucket of the proper size shall be placed into the downstream manhole and pulled, in intervals, towards the upstream manhole.
    2. The bucket shall be retrieved and emptied at varying intervals depending upon the amount of materials being removed. When a bucket is retrieved and it is completely full or overflowing with materials, then the length of travel into the main shall be reduced to ensure total removal of debris. This process shall be repeated until the bucket has been pulled through the entire main section. Upon completion of the bucketing or rodding operation, hydraulically propelled cleaning equipment or high velocity hydro-cleaning equipment shall be used to complete the cleaning work.
  - F. Root Removal: Roots shall be removed from sections designated to be relined. Special attention shall be used during the cleaning operation to assure complete removal of roots from the joints. Procedures may include the use of mechanical equipment such as rodding machines, bucket machines and winches using root cutters and porcupines, and equipment such as high-velocity jet cleaners.
  - G. Material Removal: All sludge, dirt, sand, rocks, grease, and other solid or semisolid material resulting from the cleaning operation shall be removed at the downstream manhole of the section being cleaned. Passing material from manhole section to manhole section, which could cause main stoppages, accumulations of sand in wet wells, or damage pumping equipment, shall not be permitted.
  - H. Disposal of Materials: All solids, semisolids and/or liquids resulting from the cleaning operations shall be removed from the work site and disposed of at a site approved to accept wastewater debris and liquids. All materials shall be removed from the site no less often than at the end of each workday. Under no circumstances will the Contractor be allowed to accumulate debris, etc., on the site of work beyond



the stated time, except in totally enclosed containers and as approved by the County. UNDER NO CIRCUMSTANCES SHALL DEBRIS AND/OR LIQUIDS REMOVED THEREFROM BE DUMPED INTO THE GROUND OR STREETS OR INTO DITCHES, CATCH BASINS OR STORM DRAINS FOR ANY LENGTH OF TIME. Contractor shall be responsible for all disposal costs.

- I. Protruding Tap Removal: Service taps extending into the pipe shall be removed by means of hydraulically or mechanically operated equipment. Chain cutters, clamshell cutters, and robotic lateral reinstatement cutters are typical equipment used to remove protruding taps. Taps should be removed so that the resulting protrusion is less than 1" at the greatest point. All debris resulting from protruding tap removal shall be removed immediately from the pipe. Where protruding taps are vitrified clay, grinding wheels may be used on lateral reinstatement cutters to insure a smooth finish. Where protruding taps prevent the passage of equipment through the pipe, notify the County immediately for point repair execution. Note: All protruding taps must be verified via television inspection prior to inserting any type of cutting tool into the main.
- J. GREASE REMOVAL: Grease shall be removed in designated sections where grease is a known problem and shall be considered part of the cleaning procedures. The Contractor shall provide a list of lines requiring grease removal to the County and the project manager so that they may be added to the County's on-going maintenance list. Special attention should be given during the cleaning operations to ensure the complete removal of grease from the top of the pipe. Procedures may include the use of mechanical equipment such as rodding machines, bucket machines and winches using root cutter and porcupines, and equipment such as high-velocity jet cleaners, and hot water. Chemical means of grease removal will be allowed upon request by the Contractor; however, it is considered subsidiary to Line Cleaning, and no additional payment will be allowed.
- K. Final Acceptance: Acceptance of pipe cleaning shall be made upon the successful completion of the television/sonar inspection and shall be to the satisfaction of the County. If the inspection shows the cleaning to be unsatisfactory, the Contractor shall be required to reclean and reinspect the pipe, at no additional cost to the County, until the cleaning is shown to be satisfactory.

#### 1.02 CLEANING PRECAUTIONS

- A. Bucket machines or rodding machines shall be used very carefully because of their tendency to "hang-up" on or "wedge against" the sewer main and break it. Only experienced and well-trained operators shall operate the machines(s).
- B. Whenever hydraulically propelled cleaning tools, or high velocity, hydro-cleaning equipment or any tools which retard the flow of water in the sewer mains are used, precautions shall be taken to ensure that the water pressure so created does not cause

any damage or flooding to public or private property being served by the main involved.

- C. Any damage to the sewer mains caused by the Contractor's operations shall be repaired in a manner approved by the County at the Contractor's expense. The County reserves the right to make said repairs itself and charge the Contractor accordingly.
- D. Damage due to flooding of any public or private property being served by any main which is over-filled by Contractor's cleaning operations shall also be repaired or otherwise paid for by the Contractor.

### 1.03 DOCUMENTATION

- A. The Contractor shall keep records (in a log-type form) of the work accomplished in the cleaning of the pipes. With each pay request, digital backup documentation is required. The following information shall be required as a minimum:
  - 1. Location (street address) and type of surface cover.
  - 2. Manhole ID Number to Manhole ID Number.
  - 3. Pipe ID Number
  - 4. Date and Time.
  - 5. Length of Pipe.
  - 6. Condition and depth of manholes.
  - 7. Size and type of main.
  - 8. Type and condition of manhole.
  - 9. Type of cleaning performed and various types of equipment used.
  - 10. Meter readings (fire hydrant use).
  - 11. Remarks as to type of materials removed, amount of materials removed, and number of hours spent on each pipe section.
- B. The Contractor shall complete work on each asset as assigned via the County's Computerized Work Order Management system. Upon start of work, the Contractor shall receive work orders as assigned by the Project Manager. The Contractor shall utilize the Mobile Work Manager to maintain and synchronize the status of each rehabilitation work order issued.

END OF SECTION

**SECTION 02742**  
**SANITARY SEWER TELEVISION-SONAR INSPECTION**

**PART 1      GENERAL**

**1.01      SCOPE**

- A.    The work of this section is to determine the internal physical condition of the sewer main, locate physical defects, locate service connections and locate possible sources of infiltration and inflow.

**1.02      REFERENCES**

- A.    Codes, Specifications, and Standards
- B.    NASSCO – National Association of Sewer Service Companies
- C.    Testing and Materials Standards (None Cited)
- D.    Rockdale County Water Resources Water and Wastewater Standards and Specifications
- E.    General Conditions for Rockdale County Construction Contracts, Rockdale County

**1.03      DEFINITIONS**

- A.    External Hard Drive: For the purposes of this specification, an external hard drive is a peripheral auxiliary device that connects to the computer via a high-speed interface cable. The interface cable allows the external hard drive to communicate with the computer so that data may be passed back and forth. The most common types of interfaces are USB and Firewire. The Contractor will deliver all inspection databases, digital reports and media to the County on an external hard drive that is compatible with the Data Administrator's desktop system.
- B.    Header: All reference data at the head of the coding sheet, other than pipe condition data, attaching to the pipeline being inspected.
- C.    Internal Condition Grade (ICG): The relative state of a main with respect to structural integrity or performance as related to specified criteria. In broad terms, it is a quantitative or comparative rating describing the potential for the pipe to collapse or fail to provide the designed flow capacity.
- D.    Internal Service Condition: The ability of a length of pipe to perform its intended function as determined by the degree of non-structural defects.

- E. Main Inspection: Directly viewing the main with the aid of CCTV equipment and or manually (2) remote inspections of the main through electromagnetic, acoustic, or other technologies, or (3) the monitoring and definition of conditions within the main, as necessary to assess overall condition and performance of the main. Inspection may be carried out simultaneously with other activities, such as preparatory cleaning or pre/post renovation measures. Inspection activities may be combined or stand-alone activities as appropriate to the conditions encountered.
- F. Main Structural Condition: Assessment of the structural integrity of the main.
- G. Main Service Condition: Assessment of the service condition of the main, reflecting the conduit's capacity, potential for blockage, and water tightness.
- H. MPEG: MPEG (pronounced M-peg), which stands for Moving Pictures Expert Group, is the nickname given to a family of International Standards used for coding audio-visual information in a digital compressed format. For the purposes of this specification, MPEG shall be defined as an ISO-MPEG Level 4 standard (MPEG- 4) digital audio- visual coding having a minimum resolution of 500 lines. All video files shall be named using .mpg or .wmv as the file extension.
- I. Sonar Inspection: Operation necessary to complete an inspection for verification of existing internal pipe conditions including amount of debris in the bottom. Sonar inspection will supplement, not replace CCTV. Contractor shall furnish all labor, materials, equipment, tools, and other incidental services for sonar inspection. Sonar inspection of a particular pipe will only be conducted when approved in writing by the County.
- J. Sonar/Tiscit: Operation necessary to complete both a CCTV and sonar inspection for verification of existing internal conditions. Both the CCTV and sonar will be displayed together on the audio visual documentation. Contractor shall furnish all labor, materials, equipment, tools, and other incidental services for the sonar/tiscit inspection.
- K. Television Inspection: Operation necessary to complete a true-color audio-visual inspection for verification of existing internal pipe conditions including pipe materials, pipe grade, connections, cracks, leaking joints, seepage and roots. Contractor shall furnish all labor, materials, equipment, tools, and other incidental services for closed circuit television inspection. (CCTV)

## **PART 2 EXPERIENCE**

- A. Supervisor of the field crews performing these functions shall have the proper training in these types of equipment and monitoring functions and have a minimum of five (5) years experience in performing such assignments including safe work practices, etc.
- B. Field crew leaders performing these functions shall have the proper training in

these types of equipment and monitoring functions and have a minimum of three (3) years experience in performing such assignments including safe working practices, etc.

- C. The Contractor shall provide the County with written documentation (certification) that the supervisor, field crew leader and all crewmembers responsible for these assignments have the proper training and the requisite experience.
- D. No crewmembers shall enter confined spaces without the necessary certified training and at least one-year experience.
- E. The required experience shall be documented in the Contractor's Request for Proposal submittal.

### **PART 3 PRODUCTS**

#### **3.01 GENERAL**

- A. The Contractor shall furnish the mobile television/sonar inspection studio, television camera, sonar, audio-visual digital encoding equipment / software, and other necessary equipment, materials, power, labor, and technicians as needed to perform the television inspection.
- B. The television/sonar inspection equipment shall be capable of inspecting a minimum of 1,500 feet of pipe, when entry into the line can be accessed from the upstream and downstream manhole. When entry is at one end only, the inspection equipment shall be capable of inspecting seven hundred and fifty (750) feet by a self-propelled unit. The inspection equipment shall be capable of clearly televising the interior of a 6-inch and larger diameter pipes.
- C. The television/sonar equipment shall be transported in a stable condition through the pipe line main under inspection. Throughout the inspection, the camera equipment shall be positioned with the camera directed along the longitudinal axis of the pipe. When the television/sonar equipment is towed by winch and bond through the pipe line, all winches shall be stable with either locking or ratcheting drums. All winches shall be inherently stable under loaded conditions. The bonds shall be steel or of an equally non-elastic material to ensure the smooth and steady progress of the camera/sonar equipment. The bonds shall be oriented in such a manner as to enable unhindered extension or retraction through the line. All effort shall be made to prevent damage to the pipe during the television/sonar inspection. In the case where damage is caused by the Contractor, for any reason, such as would be caused by incorrect deployment of bonds or retrieval of lodged equipment, the cost of repair or remedy shall be borne by the Contractor.

- D. The Contractor shall divert wastewater flow in accordance with the requirements of the Wastewater Flow Control Specification.
- E. The studio shall be of sufficient size to accommodate four people for the purpose of viewing the television/sonar monitor while the inspection is in progress. The studio shall be insulated against noise and extremes in temperature, and shall be provided with means of controlling external and internal sources of light in a manner capable of ensuring that the monitor screen display is in accordance with the requirements of these Specifications. The County or its representative shall have access to view the television/sonar screen at all times. The central control panel and television camera and sonar control shall be located in the studio. The studio shall be mounted on a mobile vehicle (truck or trailer), which allows safe and orderly movement of the inspection equipment throughout the job site.
- F. The television camera used for the pipe line inspection shall be one specifically designed and constructed for pipeline inspection. The camera shall be waterproof and shall be operative in any conditions that may be encountered in the inspection environment. The Contractor shall provide a color pan and tilt camera to facilitate the inspection of service laterals, sewer mains, and manhole defects. The television camera shall be capable of 360° rotational scan indicating any salient defects. The tilt arc must not be less than 225° unless otherwise approved by the County. The adjustment of focus and iris shall provide a minimum focal range of 3 inches in front of the camera's lens. The distance along the pipe in focus from the initial point of observation shall be a minimum of three times the vertical height of the pipe. The illumination must be such as to allow an even distribution of the light around the perimeter without the loss of contrast, flare out of picture, or shadowing. The view seen by the television camera shall be transmitted to a monitor of not less than 11 inches in size. The television camera shall be capable of receiving and transmitting a picture having not less than a resolution of 500 lines. The travel speed of the television inspection camera (through the pipe) shall be uniform and shall not exceed the maximum speed directed by the County of 30 feet per minute.
- G. The Contractor shall test the television inspection equipment to verify the picture quality. The Marconi Regulation Chart No. 1 or the equipment manufacturer's recommendation shall be used to clearly differentiate between the following colors: white, yellow, cyan, green, magenta, red, blue and black.
- H. The television inspection equipment shall be of such quality as to enable the following to be achieved:

1. Color: With the monitor adjusted for correct saturation, the six colors plus black and white shall be clearly resolved with the primary and complementary colors in order of decreasing luminance.
  2. Linearity: The background grid shall show squares of equal size, without convergence/divergence over the whole of picture. The center circle shall appear round and have the correct height/width relationship (+/-5%).
  3. Resolution: The live picture must be displayed on a digital capable of providing a clear, color, stable image free of electrical interference with a minimum resolution of not less than 500 lines.
  4. Color Consistency: To ensure that the camera shall provide similar results when used with its own illumination source, the lighting shall be fixed in intensity prior to commencing the survey. In order to ensure color consistency no variation in illumination shall take place during the inspection.
- I. The County may periodically check both the live and video picture color consistency against the calibration charts. Any differences will necessitate re-survey of the new length or lengths affected, at the Contractor's expense.
  - J. The closed circuit television monitor display shall incorporate an automatically updated record in feet and tenths of a foot of the distance along the line from the cable calibration point to the center point of the camera or center point of the transducer, whichever unit is being used. The relative positions of the two center points should also be noted. The Contractor shall use a suitable metering device that enables the cable length to be accurately measured; this shall be accurate to +/-1% or 6 inches whichever is greater. The Contractor shall calibrate the footage meter on a regular basis and demonstrate that the tolerance is being achieved by tape measurement between manholes on the surface. This taped measurement must be included on a quality control form which will be completed and submitted by the Contractor depicting the level of accuracy achieved.
  - K. If the Contractor fails to meet the required standard of accuracy, the County will instruct the Contractor to provide a new device to measure the footage. The County may at their discretion instruct the Contractor in writing, to re-survey those lengths of pipe first inspected with the original measuring device, at no additional expense to the County.
  - L. All audio-visual recordings and collected data made during the television inspection shall become the property of the County and shall be submitted to the County immediately upon completion of the television inspection.

## **PART 4 EXECUTION**

### **4.01 GENERAL**

- A. The Contractor shall inspect pipelines with: (1) color pan and tilt CCTV imagery, (2) sonar imagery, (3) combined color pan and tilt CCTV/Sonar (TISCIT) imagery, (4) laser profiling imagery and (5) hydrogen sulfide gas detection, as requested so as to record all relevant features and to confirm their structural and service condition. Surveys/Inspections of pipelines shall be carried out in accordance with NASSCO PACP Coding standards and data formats.
- B. Cleaning shall be performed in accordance with the requirements of Pipeline System Cleaning Specification. Pipes should be sufficiently clean so as to allow for clear viewing of all of the interior surfaces of the lines during television inspection. A PACP certified technician or supervisor shall control operation of television equipment and encoding of inspection. Should Contractor utilize any personnel to actually document the inspection results that is not PACP certified, those inspections shall be refused and re-survey shall be completely at the Contractor's expense.
- C. Generally sonar alone shall be used where depth of flow in the sewer exceeds 75% of overall diameter and the level of the flow can be artificially increased, without the risk of flooding, to ensure that the pipe is completely surcharged during the inspection.
- D. Inspection shall be documented using NASSCO's Pipeline Assessment and Certification Program (PACP).
- E. If television/sonar inspection of an entire section cannot be successfully performed from one manhole, a reverse setup shall be performed to obtain a complete inspection. REVERSE SETUPS shall be considered as subsidiary to the unit price bid for CCTV inspection. The objective of this project is to inspect the maximum amount of the sanitary sewer and it is likely that a number of reverse set-ups will be required in order to maximize the pipeline footage inspected.
- F. Each pipe length, i.e. the length of pipe between two consecutive manholes, shall be entered on separate work order headers electronically. Thus where a Contractor elects to "pull through" a manhole during a CCTV and/or Sonar Survey, a new coding sheet shall be started at the manhole "pulled or walked through" and the footage re-set to zero on the coding sheet. Where a length of pipe between consecutive manholes is surveyed from each end (due to an obstruction or structural failure) two coding sheets should be used. Where a length of pipe between two consecutive manholes cannot be surveyed or attempted for practical reasons a (complete header) coded sheet shall be made out defining the reason for abandonment. At the start of each pipe length being surveyed or inspected and each reverse set-up, the length of pipeline from zero footage, the entrance to the



pipe, up to the cable calibration point shall be recorded and reported in order to obtain a full record of the pipe length. All reverse set-ups, blind manholes, and buried manholes shall be logged on a separate log. Video digits shall be recorded so that every recorded feature has a correct elapsed time stamp and footage. Each log shall make reference to the start Upstream Manhole (AMH) and finish Downstream Manhole (AMH) unless abandonment took place because of blockage. Manhole Facility ID numbers shall be indicated in the remarks column of the detail report. Only the field "Direction of Inspection" and the order of the start and finish manholes as listed on the observations section of the inspection will be utilized to indicate reverse setups.

- G. The Contractor shall provide a complete television inspection of both the upstream and downstream manholes beginning at the top of each manhole and panning down to inspect the entire manhole. Contractor shall also stop and pan each service lateral as standard procedure.
- H. Whenever prevailing conditions allow, the camera head shall be positioned to reduce the risk of picture distortion. In circular pipes, the camera lens shall be positioned centrally (i.e. in prime position) within the pipe. In non- circular pipes, picture orientation shall be taken at mid-height, unless otherwise agreed, and centered horizontally. In all instances the camera lens shall be directed along the longitudinal axis of the pipe when in prime position. A positioning tolerance of  $\pm 10\%$  of the vertical pipe dimension shall be allowed when the camera is in prime position.
- I. All television inspections shall be performed during low flow conditions. The County reserves right to refuse any television inspection that does not produce an effective survey of the pipe because of high flow conditions or for any other reason.
- J. For standard CCTV, if flows are greater than 25% of the pipe diameter the Contractor will either control the wastewater flow according to Wastewater Flow Control or return at a time when flows are less than 25%.
- K. If a laser inspection is authorized, the laser unit shall be mounted on the tractor or float so that the unit is above the water surface. The laser unit must not interfere with the forward view of the CCTV camera. If the unit is float mounted, the operator should make certain that there is sufficient headroom in the pipeline to prevent the laser mount from striking the crown of the pipe.
- L. If a sonar inspection is authorized, the sonar unit shall be mounted on the tractor or float so that the unit is under the water surface. The operator shall make certain that there is sufficient depth of fluid in the pipeline to prevent the grounding of the sonar mount, including an allowance for any debris or sedimentation.

- M. Where laser and CCTV inspection are to be conducted in the same pipeline segment, the CCTV inspection should generally be conducted while the camera is conveyed forward through the pipeline and the laser inspection conducted during the return of the survey unit, with the camera lighting turned off.
- N. The speed that the camera or survey unit is conveyed through the pipeline while performing general inspections shall be uniform and shall be limited to a maximum of 30-feet per minute. During CCTV inspection, the survey unit shall be slowed, stopped, or backed-up to perform detailed inspections of significant features. The camera shall be stopped at all defects, changes in material, changes in water level, changes in size, side connections, junctions, or other unusual areas. When stopped at the defect or feature, the operator shall pan the camera to the area and along the circumference of the pipe.
- O. During period of camera advancement along the reach, the operator should pan to view the entire circumference of the pipe at regular intervals. This may be done while the camera is moving forward as long as the recorded picture quality is not adversely affected. When viewing the circumference, the camera should be returned to the forward position providing a full view of the pipe before panning to view the opposite side of the pipeline or the crown conditions.
- P. Each survey/inspection unit shall have on call equipment available to carry out the flushing, rodding and jetting of pipes as and when such procedures are deemed to be necessary.
- Q. The Contractor shall maintain on site at all times a competent field supervisor in charge of the survey/inspection. The field supervisor shall be identified in the Bidder's Submittal. Any change in the Supervisor after award of the work must be approved in writing by the Program Manager and the Engineer prior to commencement of Work. The field supervisor shall be responsible for the safety of all site workers and site conditions as well as ensuring that all work is conducted in conformance with these specifications and to the level of quality specified.

## **PART 5 EQUIPMENT**

- 5.1 The Conventional CCTV/Sonar/TISCIT/Laser inspecting equipment shall be capable of surveying or inspecting a length of conduit at least 1500 feet when entry into the pipe may be obtained at each end. Equipment shall be capable of performing inspections up to 100 feet by rodding or up to 750 feet where a self-propelled unit is used, when entry is possible at one end only. The Contractor shall maintain this equipment in full working

order and shall satisfy the Project Manager at the commencement of each working shift that all items of equipment have been provided and are in full working order.

- 5.2** Where CCTV surveys will be performed in pipes larger than 36-inches diameter, provide equipment with a motorized, remote operated camera lift (or equivalent) in order to center the cameras +/- 10% of the centerline of the pipe as specified in NASSCO PACP standards.
- 5.3** Each survey/inspection unit shall contain a means of transporting the CCTV camera and/or sonar and laser equipment in a stable condition through the sewer under survey and/or inspection. Such equipment shall ensure the CCTV camera or sonar equipment is maintained at or near to the central axis of a circular shaped sewer.
- 5.4** Where the CCTV camera, Sonar head, or laser unit are towed by winch and bond through the sewer, all winches shall be stable with either lockable or ratcheted drums. All bonds shall be steel or of an equally non-elastic material to ensure the smooth and steady progress of the CCTV camera and/or Sonar equipment. All winches shall be inherently stable under loaded conditions.
- 5.5** Each unit shall carry sufficient numbers of guides and rollers such that, when surveying or inspecting, all bonds are supported away from pipe walls, joints, taps, and manhole structures. All CCTV/Sonar/Laser cables and/or lines used to measure the CCTV camera's location within the pipeline must be maintained in a taut state and set at right angles where possible, to run through or over the measuring equipment.
- 5.6** All CCTV equipment shall produce clear, high-quality video images under the conditions into which they are to be deployed. The successful Bidder shall be required to demonstrate the quality of the CCTV image produced by their equipment prior to being allowed to deploy the units. The Contractor shall maintain the approved level of image clarity throughout the duration of the Contract. Should image quality be found to be inadequate due to the deterioration of the unit or ancillary devices, GCDWR shall have the right to require the Contractor to remove the unit from service until it can be demonstrated to provide sufficiently clear and detailed images. The Contractor shall ensure that the equipment is operated in a manner that produces adequate image quality. No payment shall be made for CCTV inspections which do not result in clear, high-quality video.
- 5.7** The Contractor shall use a suitable metering device, which enables the cable length to be accurately measured; this shall be accurate to  $\pm 1\%$  or 6 inches whichever is the greater.
- 5.8** Lighting intensity shall be remote controlled and shall be adjusted to minimize reflective glare. Lighting and camera quality shall provide a clear, in-focus picture of the inside

periphery of the pipes and laterals for all conditions except submergence. Under ideal conditions (no fog in the pipeline) the camera lighting shall allow a clear picture up to three diameter lengths away for the entire periphery of the pipe. The lighting shall provide uniform light free from shadows or hot spots.

- 5.9** If an inspection has been attempted, and is unable to pass through a portion of the intended inspection area, the Project Manager may allow the sensors to be placed on a RAFT on a case by case basis.
- 5.10** The CCTV video equipment must be capable of transmitting with minimum loss of clarity from the underground pipe environment to a surface control center. It is preferred but necessarily required that the CCTV service provider utilize a fiber optic cable for signal transmission. The cable must support multiplexing of numerous signals from numerous sensors over the one fiber. CCTV signal transmission must maintain adequate image detail to the satisfaction of the Project Manager and must also shield the video signal from interference. The image quality must not be impacted by ground differential in long inspection runs over 1000 feet.
- 5.11** The Laser scanning equipment shall be capable of measuring the distances to objects and surfaces in pipes and shall be capable of imaging pipes from 48 inches to 180 inches in diameter. The laser shall support 75 Hz scan rates or higher and be Class 1 eye-safe for operator safety. The laser unit shall be capable of being repeatedly actuated to provide data that eliminates six degree-of-freedom sensor alignment problems. The laser sensor resolution shall be 1.0 mm, with a laser sensor accuracy of 1.0 cm at 10 feet in pipes 48 inches and larger.
- 5.12** An integrated overview of Corrosion and Buildup data revealed from laser scanning is to be presented in a color coded format as an unrolled illustration of the pipe condition above the springline (9:00 to 3:00 clocking angles inclusive) over the length of the inspection segment. Measured pipe Internal Diameter (ID) that coincides with expected values must be coded green. Material loss (corrosion), as measured by increasing pipe ID, must be colored on a yellow/red color scale, with red indicating advanced corrosion. Material gain (buildup), as measured by decreasing pipe ID, must be on a blue color scale. To support identified radial localization of defects, individual ID measurements, as computed from the axis of the inspected pipe, must be presented in an illustrated corrosion/buildup graph form for the 9:00, 10:30, 12:00, 1:30 and 3:00 clocking angle positions over the length of the inspection segment.
- 5.13** Precision high resolution laser scan views identifying ovality and eccentricity must be presented in a color coded format as an unrolled illustration of the pipe condition to include the entire pipe circumference as well as a cross- section view where precision scans are taken during the pipe inspection survey. The color coding is to be identical to

the aforementioned requirements. Where the presence of fluids in the pipe necessitates interpolation and estimation calculations to fill gaps and complete the full circumference view, the method and calculations used to support these assumptions must be presented. Sonar or as-built data, if used for these calculations, must be identified in the report. Areas revealing deflection greater than 2% must be identified in the report.

- 5.14** A color high resolution sonar still image of cross-sections of the pipeline must be taken and recorded every 50 feet or more frequently should the internal profile of the pipeline change, and at every defect. These images are to be cross-referenced to the reports and databases for ease of reference.
- 5.15** The laser equipment shall be purpose built for use in the inspection of pipelines and shall be operative in 100 percent humidity conditions. It shall be capable of being traversed by crawler tractor, float or other suitable means through the pipeline on a stable vehicle constructed to situate the laser inspection equipment above the water level.
- 5.16** The laser equipment shall be designed and manufactured to produce a high resolution of measurement resulting in:
- A. 0.25% of internal diameter, with a laser sensor accuracy of 0.5% or greater that is an accuracy of 0.5 inches at 100 inches in pipelines up to 30 inches in diameter and a accuracy of 0.10% or greater for pipelines from 15 inches to 30 inches in diameter.
  - B. 0.25% of internal diameter, with a laser sensor accuracy of 0.5% or greater -that is an accuracy of 0.5 inches at 100 inches in pipelines up to 48 inches in diameter and an accuracy of 0.10% or greater for pipelines from 36 inches to 60 inches in diameter.
  - C. The laser equipment shall be operated in a manner to minimize measurement error sources attributable to the effects of:
    - 1. Horizontal displacement from off-axis meander or pipeline alignment curvature that distorts cross- section measurement
    - 2. Vertical displacement due to sediment, debris, offset joints or other physical environment conditions that distorts cross-section measurement
    - 3. Vertical displacement due to flow condition or other hydraulic environment factors that distorts cross- section measurement
- 5.17** The maximum beam width of the sonar energy pulse will be no greater than 2 degrees from the center of the transducer. The transducer will be of the continuous scanning type. The sonar image will be in full color during the inspection.

- 5.18** The sonar survey will include complete structural and service assessment of the equivalent PACP standard as that obtained through the CCTV survey. The sonar survey will include measurement of fluid depth and silt depth.
- 5.19** The sonar survey will be continuously recorded and saved on CDs, DVDs or external hard-drives in MPEG-4 format, supported by complete defect inspection logs and summary reports.
- 5.20** Once the survey of the pipeline is under way, the following minimum information shall be continually displayed. If the displayed data is considered by the County to be disruptive to the inspection image, alternate data display criteria will be discussed:
- A. Automatic update of the camera's footage position in the line from adjusted zero
  - B. Pipe dimensions
  - C. Upstream Manhole Number
  - D. Downstream Manhole Number
  - E. Facility ID of Pipe being surveyed
  - F. Date of survey
  - G. Road name/location
  - H. Direction of survey
  - I. Time of start of survey
  - J. Material of construction of the pipe

## **PART 6 DIGITAL AUDIO VISUAL RECORDING**

- 6.1** Video Recording: Continuous digital video recordings of the inspection view as it appears on the television monitor shall be taken. The recording shall also be used as a permanent record of defects. The recording shall be MPEG-4. The digital video encoding shall include both sound and video information that can be reproduced with a video image equal or very close to the quality of the original picture on the television monitor. The replay of the recorded video information, when reviewed by an ISO-MPEG-4 compliant viewer, shall be free of electrical interference and shall produce a clear, stable image. The audio portion of the composite digital coding shall be sufficiently free of electrical

interference and background noise to produce an oral report that is clear and complete and easily discernible.

- 6.2** The audio portion of the inspection report shall include the location or identification of the Upstream manhole number to the Downstream manhole number, the direction of travel, the Pipe Facility ID being inspected, and the distance traveled on the specific run encountered. The inspection camera/sonar equipment shall be continuously connected to the monitoring equipment.
- 6.3** The recording and monitoring equipment shall have the built-in capability to allow the County to instantly review both the audio and video quality of the recordings at all times during the inspection. The size and position of the data display shall be such as not to interfere with the main subject of the picture.
- A. Once the survey of the pipeline is under way, the following minimum information shall be continually displayed
  - B. Automatic update of the camera's footage position in the line from adjusted zero
  - C. Pipe dimensions
  - D. Upstream Manhole Number
  - E. Downstream Manhole Number
  - F. Facility ID of Pipe being surveyed
  - G. Date of survey
  - H. Road name/location
  - I. Direction of survey
  - J. Time of start of survey
  - K. Material of construction of the pipe
- 6.4** Separate MPEG-4 files shall be created for each pipe. In case of a reverse setup, such inspection shall be stored in a separate inspection record and MPEG file. MPEG files shall be written to External Hard Drive media for delivery to the County.
- 6.5** Footage and corresponding time elapsed shall be logged throughout survey/inspection for all relevant defects and construction features encountered unless otherwise agreed.
- 6.6** The size and position of the status data display shall be such as not to interfere with the main subject of the picture.

- 6.7** The footage reading entered on to the data display at the cable calibration point must allow for the distance from the start of the inspection to the cable calibration point such that the footage at the start of the survey is 6 ft.
- 6.8** In the case of a conduit where a new header sheet must be completed, the footage shall be preset at 6 ft. with the camera positioned four feet within the outgoing pipe entrance.
- 6.9** Video files shall be named according to the following file specification:
- A. TV\_[UPSTREAMMANHOLEID]\_[DOWNSTREAMMANHOLEID]\_[PIPEID]\_[Contractor Unique ID]\_[MMDDYYYY]\_[IncrementalNumber] .wmv
- 6.10** The incremental number shall be used if multiple inspections are performed for the same line, such as a reverse inspection setup.
- 6.11** Facility ID numbers will be provided to the Contractor by the County in a personal geodatabase or shape files.
- 6.12** The County, at its sole discretion, reserves the right to refuse any MPEG, on the basis of
- 6.13** All continuous defects shall incorporate a start and finish abbreviation in the inspection.
- 6.14** All data submittals will be in a single PACP version 4 database. All inspections shall be contained within one database.
- 6.15** All data submittals shall also contain a directory of all inspections and the corresponding Segment Grade and Quick rating Scores for Structural, Operation and Maintenance, and Overall.

## **PART 7 INSPECTION REPORTS**

### **7.1 CCTV/SONAR**

- A. The Contractor shall complete a television/inspection inspection report for each pipeline segment. These reports shall be per the format and defect codes of NASSCO's Pipeline Assessment and Certification Program (PACP) including the Scoring for Structural, Operation and Maintenance and Overall. Prior to beginning work, the Contractor shall submit a hardcopy sample of the television inspection report to the County for approval. All reports shall be exported in electronic format and delivered with the monthly invoice, database and media submittal.
- B. In addition to recording the defects for the pipes and manholes, the Contractor shall also record attribute data as work order header fields in their inspections.



- C. The report shall include the results of all tests as described above, with all supporting spreadsheets, photographs/media and field notes. The report shall include a discussion of the results, identifying all pipe segments with defects. A database showing the condition of each pipe segment with the pipe segment identification number and the location shall be submitted.
- D. Each pipe length, i.e. the length of pipe between two consecutive manholes, shall be entered on separate work order headers electronically. Thus where a Contractor elects to “pull through” a manhole during a CCTV and/or Sonar Survey and/or Laser, a new coding sheet shall be started at the manhole “pulled or walked through” and the footage re-set to zero on the coding sheet. Where a length of pipe between consecutive manholes is surveyed from each end (due to an obstruction or structural failure) two coding sheets should be used. Where a length of pipe between two consecutive manholes cannot be surveyed or attempted for practical reasons a (complete header) coded sheet shall be made out defining the reason for abandonment. At the start of each pipe length being surveyed or inspected and each reverse set-up, the length of pipeline from six feet in the entrance to the pipe, as the cable calibration point shall be recorded and reported in order to obtain a full record of the pipe length. All reverse set-ups, blind manholes, and buried manholes shall be logged on a separate log. Video digits shall be recorded so that every recorded feature has a correct elapsed time stamp and footage. Each log shall make reference to the start Upstream Manhole (AMH) and finish Downstream Manhole (AMH) unless abandonment took place because of blockage. Manhole Facility ID numbers shall be indicated in the remarks column of the detail report. Only the field “Direction of Inspection” and the order of the start and finish manholes as listed on the observations section of the inspection will be utilized to indicate reverse setups.
- E. Electronic copies (data files) shall be submitted in a PACP Database.
- F. Report shall include:
  - 1. PACP Sewer Report (w/scoring)
  - 2. TV Inspection with Pipe-Run Graph
  - 3. Observation Report with Still Images
  - 4. Sonar Sediment Report (if applicable)
  - 5. Hydrogen Sulfide and Temperature readings (if applicable)

## **7.2 LASER**

- A. A laser Final Report shall be submitted in hard color copy and digital format on an external hard drive.

- B. Laser scan final reporting shall include the pipe's true diameter, ovality (per ASTM F1216), x/y diameter, and maximum diameter. Segments or areas revealing deflection in horizontal alignment greater than 2 % must be identified in the report. Where the presence of flow in the pipeline requires interpolation and estimation calculations to fill data gaps and complete the full circumference view, the method and calculations used to support these assumptions must be presented. Sonar profiling or other data sources, such as as-built data, if used for these calculations, must be identified in the report.
- C. The report shall provide a 2-D representation of an integrated overview of pipe wall thickness loss or increase data revealed from laser scanning, presented in a color coded format as an unrolled illustration of the pipe condition above the waterline over the length of the inspection segment. The pipe interior is to be flattened into a graphic whose y-axis represents pipe diameter, whose x-axis represents pipe length and whose color represents deviation from expected values indicating a gradation and severity of corrosion or buildup. Measured pipe internal diameter (ID) that coincides with expected values must be coded in a color that positively identifies and differentiates the measurement of the expected values from pipe wall loss or increase.
- D. The report shall provide a 2-D representation of an integrated overview identifying concentricity, and deviation from concentricity resulting in ovality and eccentricity, presented in a color-coded format as an unrolled illustration of the pipe condition to include the entire pipe circumference (above the flow line) as well as a cross-section view. The pipe interior is to be flattened into a graphic whose y-axis represents pipe diameter, whose x-axis represents pipe length and whose color represents deviation from expected values indicating a gradation and severity of the deviation from concentricity. Measured pipe internal diameter (ID) that coincides with expected values must be coded in a color that positively identifies and differentiates the measurement of the expected values from actual concentricity measurements.
- E. The report shall provide a 3-D representation with variations in pipe wall shown in sharp relief for easy visual analysis for each of the aforementioned 2-D representations.
- F. Laser Final Report shall be submitted as a separate section in the CCTV/Sonar final inspection report, in color hard copy and in digital format on a non-returnable external hard drive.
- G. Laser Reports shall include (if applicable)
  - 1. Flat Summary Report
  - 2. Flat Analysis Report

3. True Diameter Summary Report
4. True Diameter Analysis Report
5. Ovality Summary Report
6. Ovality Analysis Report
7. XY Diameter Summary Report
8. XY Diameter Analysis Report
9. Capacity Summary Report
10. Capacity Analysis Report

## **PART 8 DATA QUALITY CONTROL PROCEDURES**

- 8.1** The Contractor shall operate a quality control system, to be approved by the Department, which will effectively gauge the accuracy of all survey reports produced by the operator.
- 8.2** The system shall be such that the accuracy of reporting is a function particularly of:
- A. The number of faults not recorded (omissions).
  - B. The correctness of the coding and classification of each fault recorded.
- 8.3** The minimum levels of accuracy to be attained under the various survey headings are as follows:
- A. Header Accuracy 95%
  - B. Detail Accuracy 95%
- 8.4** The Contractor's data quality control program shall include routine outside auditing of the work completed by a qualified subcontractor. The qualified subcontractor shall meet the minimum specified Contract requirements for the performance of the work and shall be approved in writing by the Department. The accuracy of the Contractor's data shall be based on the percentage of the data confirmed correct by the subcontractor. The minimum acceptable accuracy of the data shall be 95%. The general sequence of the auditing shall be as follows:
- A. The Contractor shall randomly select one day per month, typically in the first week of the month, and the work performed during this day shall be reviewed and/or repeated by the qualified subcontractor.

- B. If the work is greater than or equal to 95% accurate, no further outside auditing will be required for the month unless requested by the Department at their sole discretion. The cost for this audit is included in the allowances specified in the Bid Form. If the work is less than 95% accurate, the Contractor shall at his own expense repeat and/or correct the work and have the work re-audited by the qualified subcontractor.
- C. If this work is still less than 95% accurate, the Contractor shall repeat and/or correct and have the work re-audited, at his own expense, until the work is greater than or equal to 95% accurate.
- D. When this re-audited work is found to be greater than or equal to 95% accurate, the Contractor shall have the work of another randomly selected day in the same month reviewed and/or repeated by the qualified subcontractor at the Contractor's own expense.
- E. Steps 2 through 5 shall be repeated at the Contractor's own expense until the selected data is 95% accurate on the initial audit.
- F. The occurrence of five randomly selected days not achieving 95% accuracy on initial subcontractor review will constitute cause for dismissal.
- G. If the contractor successfully meets the 95% accuracy requirement for the initial randomly selected day for two consecutive months (Step 2 above), the contract may subsequently audit one day every other month. The Contractor may continue auditing one day every other month until the initial randomly selected day does not meet 95% accuracy, at which time it must resume auditing one day every month.
- H. The Contractor shall perform this QA/QC analysis on all data recorded before the data is submitted to the County. The Contractor shall provide a summary report of the results of the Quality Assurance analysis with each data submission.
- I. The data submissions shall undergo the same random review checks for Quality when submitted to the County. Should accuracy levels fall below 95%, the data submittal will be refused and no payment will be released. Contractor will be required to correct or re-do inspections until 95% level of accuracy is reached. Continuous data submittal refusals for quality under 95% will constitute cause for dismissal.

END OF SECTION

**SECTION 02746**  
**CURED-IN-PLACE PIPE LINING (CIPP)**

**PART 1 GENERAL**

**3.2** Work under this section shall include the rehabilitation of a full length of a existing sewer main, from manhole to manhole, by the trenchless method known as Cured-In-Place Pipe Lining (CIPP). CIPP shall consist of the installation of a resin-impregnated flexible tube that is either inverted or pulled into the existing sewer main and expanded to fit tightly against the said main by the use of water or air pressure. The resin system shall then be cured /hardened by elevating the temperature of the fluid (water/air) used for the inflation to a sufficient enough level for the initiators in the resin to effect a reaction. The resultant being a hard, impermeable pipe within a pipe.

**3.3 REFERENCES**

- A. Codes, Specifications, and Standards: (None Cited)
- B. Testing and Materials Standards  
American Society for Testing and Materials (ASTM) Standards  
D543, D638, D790, D1598, D2122, D2412, D2837, D2990, D5813, F1216, F1743, F2019
- C. Specifications for Construction of Sewer Mains, Rockdale County Department of Water Resources
- D. General Conditions for Rockdale County Construction Contracts, Rockdale County

**3.4 DEFINITIONS**

Cured-in-Place Pipe Liner (CIPP) is defined as a hollow cylinder consisting of a fabric tube with cured (cross linked) thermosetting resin. Interior or exterior coatings, or both, may be included. The CIPP is formed within an existing pipe and takes the shape of and fits tightly to the pipe. All as defined in ASTM Standard F1743, Subsection 3.2.1. The definitions for CIPP within ASTM Standard F1216, Subsection 3.2.1 and ASTM F2019 shall also apply.

**3.5 QUALIFICATIONS**

- A. The system proposed (material, methods, workmanship) must have been proven through previous successful installations to an extent and nature satisfactory to the County. Since CIPP is intend to have a 50-year design life, only products deemed to have this performance will be accepted. All products and their licensed installer must be pre-approved prior to the formal opening of proposals.
- B. Products and Installers must meet all of the following criteria to be deemed commercially acceptable:

1. For a Product to be considered commercially proven it shall have been successfully in service in applications similar to this project for a minimum of five (5) years. Additionally, a minimum of 250,000 linear feet and 1000 line sections must have successfully been installed in the USA. The Manufacturer (Licensor) shall have completed sufficient enough testing to document the material and the method(s) of installation proposed will produce the desired long-term performance.
2. For an Installer to be considered commercially proven, the Installer must satisfy all insurance, financial and bonding requirements of the County and must have at least three (3) years active experience in the commercial installation of the product bid. The Installer's key personnel shall each have at least 100,000 linear feet and 300 line sections of successful experience in CIPP lining of gravity sewers with the majority of those linear feet and line sections in the range required for the particular project.
3. The Installer shall demonstrate that they have a quality assurance program in place.
4. Documentation for products and installers seeking pre-approved status must be submitted to the County no less than 14 calendar days prior to the proposal due date to allow time for adequate consideration. The County will advise of acceptance (or rejection) a minimum of three days prior to the proposal due date. All required submittals must be satisfactory to the County.

### **3.6 SUBMITTALS**

- A. Submit the following for product and installer pre-approval:
  1. Manufacturer's certificate that the materials to be used meet the referenced standards and these specifications.
  2. License or certificate verifying Manufacturer's/Licensor's approval of the installer
  3. Proposed equipment and procedures for accomplishing the work.
  4. Product data and Manufacturer's installation for resin and catalyst system.
- B. Submit the following during the project for approval of the use of CIPP at a particular location:
  1. Field measurements.
  2. Design wall thickness calculations, signed and sealed by a registered professional engineer proficient in the design of CIPP systems.
  5. Contractor's procedures and materials for installation of the liner and renewal of sewer services including time and duration of sewer service unavailability.

- 6. Sampling procedures and locations for obtaining representative samples of the finished liner.
- C. A final certificate of compliance with this specification shall be provided by the manufacturer for all lining material furnished. Tests for compliance by an independent laboratory shall be made according to the applicable ASTM specification and the manufacturer's quality control program.

### **3.7 EXPERIENCE**

- A. Manufacturer – see the above requirements in Section 1.3 – Qualification Requirements.
- B. Installer - see the above requirements in Section 1.3 – Qualification Requirements.
- C. The Contractor shall have a company history of supporting this type of functions including the proper training in these types of materials, equipment and activities and have a minimum of five (5) years experience in performing such assignments including safe work practices, etc.
- D. Supervisor of the field crews shall have a history of supporting this type of functions including these types of materials, equipment and activities and have a minimum of five (5) years experience in performing such assignments including safe work practices, etc.
- E. Field crew leaders shall have a history of supporting this type of functions including the proper training in these types of materials, equipment and activities and have a minimum of three (3) years experience in performing such assignments including safe working practices, etc.
- F. The Contractor shall provide the County with written documentation (certification) that the supervisor, field crew leader and all crewmembers responsible for these assignments have the proper training and the requisite experience.
- G. No crewmembers of the Manufacturer, Installer or Contractor shall enter confined spaces without the necessary certified training and at least one-year experience.
- H. The required training and experience shall be documented in the Contractor's Request For Proposal submittal.

### **3.8 DELIVERY, STORAGE, AND HANDLING**

- A. The Contractor shall be responsible for the delivery, storage, and handling of products. No products shall be shipped to the job site without the approval of the County's Representative.
- B. Keep products safe from damage. Promptly remove damaged products from the job site. Replace damaged products with undamaged products.

### 3.9 MEASUREMENT AND PAYMENT

- A. Payment for cured-in-place pipe shall be made at the unit price bid. CIPP shall be measured by linear foot of sewer line from center of the upstream manhole to center of the downstream manhole. Payment will be full compensation for furnishing all materials, labor, tools, testing, field measurements and equipment necessary to perform all work. Payment for CIPP shall be made under Pipe Rehabilitation, Cured-In-Place Pipe (CIPP) – Full Length, Pipe Diameter (size), Liner Thickness, per linear foot.
- B. Payment for additional liner thickness shall be paid at the unit price bid. Additional liner thickness shall be paid per 1.5 mm additional thickness. Payment will be full compensation for furnishing all materials, labor, tools, testing, field measurements and equipment necessary to perform all work. Payment for additional liner thickness shall be made under Pipe Rehabilitation, Cured-In-Place Pipe (CIPP) – Full Length, Pipe Diameter (size), Additional Liner Thickness, per linear foot.
- C. Payment for service lateral reinstatement shall be paid at the unit price bid. Payment will be full compensation for furnishing all materials, labor, tools, testing, field measurements, and equipment necessary to perform all work. Payment for service lateral reinstatement shall be made under Pipe Rehabilitation, Cured-In-Place Pipe (CIPP) – Full Length, Remote or Man Entry, per each.
- D. No separate payment will be made for television inspection when that inspection is associated with the installation of CIPP. The work and materials being considered as incidental to and part of the CIPP unit bid prices.
- E. No separate payment will be made for the light cleaning of the sewer line when that cleaning is associated with the installation of CIPP. The work and materials being considered as incidental to and part of the CIPP unit bid prices.
- F. No separate payment will be made for wastewater flow control associated with the installation of cured-in-place pipe (CIPP). The work and materials being considered as incidental to and part of CIPP unit prices.
- G. If heavy or specialty cleaning is required prior to the installation of CIPP then the County must approve that cleaning before the work begins. Payment for heavy or specialty cleaning prior to CIPP shall be made at the unit price bid. Sewer main cleaning shall be measured by linear foot of sewer main from center of the upstream manhole to center of the downstream manhole. Payment will be full compensation for furnishing all labor, tools, and equipment necessary to perform all work. Payment for sewer main cleaning shall be made under Heavy or Specialty, Cleaning Sewer, Pipe Diameter (size), per linear foot.



## **PART 2      PRODUCTS**

### **2.1      GENERAL**

- A. The finished pipe liner in place shall be fabricated from materials which when complete are chemically resistant to and will withstand internal exposure to common domestic sewage having a pH range of 5 to 11 and temperatures up to 150°F.
- B. Liner design may be based on material properties of the liner that exceed the minimum values specified in ASTM F1216. However, the initial flexural modulus used in structural design calculations shall not exceed 400,000 psi.
- C. The minimum length shall be that deemed necessary by the Contractor to effectively span the distance from the inlet to the outlet of the respective manholes unless otherwise specified. The Contractor shall verify the lengths in the field before manufacturing.
- D. Prior to design and manufacture of the liner the Contractor shall take all necessary field measurements (including, but not limited to, the condition of the host pipe, diameter, ovality, deflection and length of the host pipe, bury conditions, soil type, soil loading factor and hydrostatic load) to ensure the liner is designed for the particular location's conditions.
- E. The liner must be designed for a minimum service life of 50 years.
- F. Unless field measurements determine other conditions, the liner shall be structurally designed for a minimum conditions: earth load of 8.0 feet at the pipe invert; hydrostatic load at the pipe invert of 80% of the pipe's depth or 8.0 feet (whichever is greater); fully deteriorated host pipe/direct bury condition; prism loading; soil loading of 125 pcf; factor of safety of 2.0; 6% ovality; maximum deflection of 5%; soil modulus of 1000 psi, maximum lining enhancement factor of 7; H-20 live loading; and 50% long-term modulus reduction factor. For brick sewers, use 6% ovality or the actual ovality measured in the field, whichever is greater.

### **2.2      CURED-IN-PLACE LINER**

- A. All cured-in-place lining products shall comply with ASTM F-1216 or intent thereof as determined by the County.
- B. The flexible tube shall be fabricated to a size that when installed will neatly fit the internal circumference of the existing sanitary sewer lines (including services). Allowance shall be made for circumferential stretching during insertion so that the final cured product is snug against the wall of the host pipe.
- C. Unless otherwise specified, the Contractor shall furnish a general purpose, unsaturated, polyester or vinyl ester resin and catalyst system compatible with the reconstruction inversion process that provides cured physical strengths specified herein.

- D. Resin system shall not contain non-structural enhancing fillers of any kind. The Contractor shall submit for approval, by the County, the proposed resin system.

## **PART 3 EXECUTION**

### **3.1 PREPARATION**

- A. The following installation procedures shall be adhered to unless otherwise approved by the County's representative.
- B. The Contractor shall carry out his operations in strict accordance with all OSHA, State, local, and manufacturer's safety requirements. Particular attention is drawn to those safety requirements involving entering confined spaces (follow OSHA requirements) and steam curing. Curing with pressurized steam creates additional safety concerns with regard to high temperatures, quick burn times, potential blow offs, etcetera. Contractors shall take additional precautions to secure the work area and insure the safety of everyone in or around the curing apparatus. Contractors utilizing this method shall provide Rockdale County a copy of their company's standard operating procedure that addresses safety issues for this methodology.
- C. It shall be the responsibility of the Contractor to remove all internal debris and clean the existing sewer line prior to installation of the liner. Cleaning and disposal of material shall be performed in conformance with Section 02741 - Sewer Line Cleaning. Once cleaned, the pipe shall be shown via video as ready for CIPP installation.
- D. Experienced personnel trained in locating breaks, obstacles and service connections by closed circuit television shall perform inspection of existing sewer lines. The interior of the line shall be carefully inspected to determine the location of any conditions that may prevent proper installation of the liner pipe into the lines, and such conditions shall be noted so they can be corrected. A videotape and suitable log shall be kept for later reference by the County as specified in Section 02741 - Sewer Line Cleaning.
- E. The Contractor shall provide for the flow of sewage around the section or sections of pipe designated for lining as specified in Section 02740 - Bypass Pumping/Wastewater Flow Control.
- F. The Contractor shall clear the line of obstructions such as solids, dropped joints, protruding service connections and/or collapsed pipe. If inspection reveals an obstruction that cannot be removed by conventional sewer cleaning equipment, the Contractor shall make a point repair excavation to uncover and remove or repair the obstruction prior to lining. Pre-lining point repairs will be paid for at the unit prices bid.
- G. In general, point repairs shall be performed early in the project/assignment. Point repairs shall be performed well in advance of scheduling liner installation, allowing for sufficient time for the County to review post point repair videos. These videos are

expected to show the pipes are ready for CIPP installation with quality point repairs, clean pipe, and trimmed protruding taps clearly viewable.

- H. Do not install liner if ground water temperatures and/or ambient temperatures are excessive for the product installation procedures.
- I. Remove and clear service connections protruding more than ½-inch into the host pipe for 8” to 18” main lines, and more than 1-inch into the host pipe for main lines 20” diameter and above. The Contractor shall trim the protruding service connections using any means commercially practicable, including cutters/grinders powered by cleaning equipment or specialized robotic equipment (including CIPP tap cutting robots). Chain flail or similar devices shall not be used for trimming protruding services. The Contractor shall cut/grind the intruding service connections to within ½” of the inner wall of the host pipe, to the extent the condition of the host pipe will allow.
- J. The Contractor is responsible for determining the location of all active services connections (sanitary and storm) well in advance of scheduling CIPP installation, which is normally during the cleaning and CCTV process. The Contractor shall dye test as needed to verify active service connections.
- K. The Contractor shall notify residents affected by sewer service restrictions, parking restrictions, Contractor access requirements, and noise by going door to door to brief residents and acquire information concerning resident needs. Door hangers briefly explaining the process, schedule, and contacts shall be left with all residents. Notify each affected property in accordance with Section 01012 – CONTRACTOR’S Use of Premises.
- L. The CCTV video made in conjunction with the Pre-Installation Cleaning shall show the pipe as ready to line, with the pipe clean, protruding services trimmed, and point repairs properly completed. The video must be provided for review by the County well in advance of the scheduled CIPP installation date. These video reviews should be expected to take a minimum of two weeks (for non-emergencies) from the date an acceptable video is submitted.
  - 1. Where practicable, liners can be installed in continuous runs through manholes where there are two or more continuous sewer segments, especially to connect several short segments with a continuous lining.

### **3.2 INSTALLATION**

#### **A. General**

- 1. Alternative methods of liner insertion, pressurization, and processing may be used for products and processes approved by the Georgia Department of Natural Resources and the County, and when the final liner product meets the intent of ASTM installation procedures as determined by the County. Installation shall be in

accordance with manufacturer's recommendations, which shall be available for verification by the inspector

2. Seal the area where the line enters or leaves each manhole. Finish the inside of the manhole with a quick set cement grout to raise the invert to the grade of the liner pipe. Also use this grout to dress up around the end of the liner. This space may be sealed with a mechanical seal, chemical seal, or combination of both. The County must approve the chosen method.
3. If the pipe liner fails to make a tight seal due to broken or misaligned pipe at the manhole wall or other reason, the Contractor shall apply a seal at that point. The County shall approve the seal.
4. The temperature of water discharged to the sewer system from processing liners shall not exceed 100°F maximum or the level allowed by State or local standards.
5. After the liner has been installed, all active, existing services shall be temporarily reinstated to 95% of the original opening. This shall be done without excavation in pavement areas, and in the case of non-man-entry pipes, from the interior of the pipeline by means of a 360° television camera and a cutting device that re-establishes the service connection. When a remote cutting device is used and a cleanout is available, then a mini-camera down the service may also be used to assist the operator in cutting or trimming.

**B. Cured-In-Place Liner**

1. The Contractor shall designate a location where the reconstruction tube will be vacuum impregnated prior to installation. The Contractor shall allow the County to inspect the materials and "wet out" procedure. A catalyst system compatible with the resin and reconstruction tube shall be used. Sufficient resin will be provided to insure the felt tube is completely saturated with additional resin as necessary to flow into cracked pipe and or joints of the hot pipe after curing.
2. The wet out reconstruction tube shall be inserted through an existing manhole or other approved access by means of an inversion process, pulled in place process, or other approved method, and the application of a hydrostatic head, or equivalent pressure sufficient to fully extend it to the next designated manhole or termination point. The reconstruction tube shall be inserted into the vertical inversion standpipe with the impermeable plastic membrane side out. The inversion head will be adjusted to be of sufficient height to cause the impregnated tube to invert from manhole to manhole and hold the tube tight to the pipe wall, produce dimples at side connections and flared ends at the manholes. Groundwater levels shall be taken into account when considering the necessary hydrostatic pressure on the CIPP liner. The use of a lubricant is recommended. Care shall be taken during the elevated curing temperature so as not to overstress the felt fiber.

3. After inversion is completed the Contractor shall supply suitable heat source and recirculation equipment. The equipment shall be capable of delivering the heat source throughout the section uniformly to raise the temperature above the temperature required to affect a cure of the resin. This temperature shall be determined by the resin/catalyst system employed. Remote temperature sensors shall be provided to document the temperature and curing times.
4. The heat source shall be fitted with suitable monitors to gauge the temperature of the incoming and outgoing heat source. Another such gauge shall be placed between the impregnated reconstruction tube and the pipe invert at the remote manhole to determine the temperatures during cure. The resin manufacturer shall recommend temperature in the line during the cure period.
5. Initial cure shall be deemed to be completed when inspection of the exposed portions of cured pipe appear to be hard and sound and the remote temperature sensor indicates that the temperature is of a magnitude to realize the exothermal properties of the resin system. The cure period shall be of a duration recommended by the resin manufacturer, as modified for the cured-in-place inversion process, during which time the recirculation of the heat source and cycling of the heat exchanger to maintain the temperature continues.
6. The Contractor shall cool the hardened pipe to a temperature of 100° F or below before relieving the static head in the inversion standpipe. Cool-down may be accomplished by the introduction of cool water into the inversion standpipe to replace water being drained from a small hole made in the downstream end discharging to the sewer. Care shall be taken in the release of the static head so that a vacuum will not be developed that could damage the newly installed CIPP liner.

C. Service Lateral Re-Instatement

1. Existing sewer service laterals will be internally reinstated to 100% of their pre-CIPP flow diameter once the mainline liner has fully cured. The finished opening shall be smooth with no ragged edges and shall prevent clogging or blockages.

### **3.3 POST INSTALLATION**

- A. Where liners of any type are installed in two or more continuous manhole segments, the liner invert through the intermediate manholes shall be left intact. Final finishing of the installation in those intermediate manholes shall require removal of the top of the exposed liner and neat trimming of the liner edge where it touches the lip of the manhole bench.
- B. Portions of any piece of liner material removed during installation shall be available for inspection and retention by the County.
- C. All manhole drop connections will be reviewed on an individual basis. Reinstatement openings for all drop assemblies after relining mainline sewer. Everywhere possible,

outside drop assemblies shall be lined with a cured-in-place liner compatible with the mainline liner, for the full length of the drop assembly and bend. Drop assemblies inside of manholes are not required to be relined, unless directed by the County.

- D. Each line segment lined shall be TV inspected as soon as practical after processing to assure complete curing. Segments not fully conforming to these Specifications must be immediately brought to the County's attention with a proposed method of correction.

### **3.4 TESTING**

- A. The Contractor shall have an independent testing lab analyze finished liner samples taken from manhole cutoffs, service coupons, etc.
  - 1. A minimum of 1 sample shall be taken of the first segment installed, or as directed by the County.
  - 2. A minimum of 2 samples shall be taken for each 2,500 LF of liner material installed or for each manufacturing lot, if less, or as directed by the County.
  - 3. A minimum of 6 samples per project shall be taken for each type of liner furnished, or as directed by the County.
  - 4. Tests in accordance with ASTM standards for Tensile Properties, Flexural Modulus and wall thickness shall be conducted.
  - 5. The Contractor shall determine sampling location and procedures to ensure representative samples are obtained from the finished liner, subject to approval by the County.
  - 6. The Contractor shall furnish removable sizing sleeves, when possible, to collect liner samples, which accurately replicate the host pipe diameter.

### **3.5 TELEVISION INSPECTIONS**

- A. After completing lining, service renewals where directed by the County, and manhole rehabilitation/replacement, every liner and manhole shall be TV inspected with a 360° integral lighthouse camera as soon as practical to verify proper installation.
- B. All lines must be CCTV inspected following the protocols and formats as outlined in Section 02742 Sanitary Sewer Television-Sonar Inspection specifications.

### **3.6 LOW PRESSURE AIR TESTING**

- A. ALL LINED LINES MAY BE TESTED BY LOW PRESSURE AIR PER THE SPECIFICATIONS FOR CONSTRUCTION OF SEWER MAINS, ROCKDALE

COUNTY DEPARTMENT OF WATER RESOURCES INCLUDING THE FOLLOWING:

1. A representative of the County shall observe the test.
  2. It shall be the Contractor's responsibility to determine the ground water level.
- B. ALL SAFETY PRECAUTIONS SPECIFIED IN THE SPECIFICATIONS FOR CONSTRUCTION OF SEWER MAINS, ROCKDALE COUNTY DEPARTMENT OF WATER RESOURCES WILL BE FOLLOWED IN ADDITION TO THE FOLLOWING:
1. PROVIDE A SAFETY RELEASE DEVICE SET TO RELEASE AT 10 PSI BETWEEN THE AIR SUPPLY AND THE SEWER UNDER TEST.

**3.7 ACCEPTANCE**

- A. It is the intent of these specifications that the completed liner with all appurtenances shall be essentially equivalent in final quality and appearance to new sewer pipe installation. The conditions of the existing host pipe will be taken into consideration.
- B. The finished liner shall be continuous over the entire segment between manholes and homogenous throughout.
- C. The finished liner shall be fully rounded and as free as commercially practicable from visible defects, including but not limited to damage, deflection, holes, delamination, ridges, cracks, uncured resin, foreign inclusions or other objectionable defects.
- D. There shall be no visible infiltration through the liner, around the liner at manhole connections, or at the service lateral connections. Contractor shall repair any visible leaks.
- E. Where a defect in the liner requires removal of a section of the liner, in the County's opinion, the Contractor shall make all repairs as required by the County and shall install a segmental liner, compatible with the liner, to accomplish a continuous finished liner. No separate payment will be made for such defect repair or for the post-repair segmental liner.

**3.8 PRIVATE SERVICE LINE SHUTDOWN**

- A. When it is necessary to shutdown a private sewer service line while work is in progress and before the service lines are reconnected, the residents are to be notified by the Contractor at least 48 hours prior to the shutdown. No sewer or water service is to remain shutdown for more than a period of eight (8) hours unless the Contractor provides substitute services for the residents. Commercial sewer services shall be maintained at all times that the business is open. No sewage from the services or main line shall be discharged on the ground or in waterways. Holding pits or tanks are not allowed unless permitted by the State.

### **3.9 PROSECUTION OF WORK**

- A. If the Contractor discovers an inactive service lateral connection the Contractor shall received County approval before re-instating.
- B. The Contractor shall note that not all sewer lines segments have been televised in their entirety due to obstructions blocking further entry, etc. These obstructions shall be cleared to allow TV viewing of the entire segment length before lining is commenced.
- C. The number of service connections on some sewer segments may exceed the number of buildings actually served. It is the Contractor's responsibility to determine through dye testing, or other acceptable methods, the services that are live and require reinstatement prior to commencing lining of the sewer main. Services that are confirmed to be inactive shall not be reconnected. Services that are inactive, but reinstated, shall be plugged at the Contractor's expense.
- D. Inactive services to vacant parcels shall be renewed, unless otherwise directed by the County.

### **3.10 DOCUMENTATION**

- A. The Contractor shall complete work on each asset as assigned via the County's Computerized Work Order Management system. Upon start of work, the Contractor shall receive work orders as assigned by the Project Manager. The Contractor shall utilize the Mobile Work Manager to maintain and synchronize the status of each rehabilitation work order issued.

### **3.11 WARRANTY**

- A. The Contractor shall guarantee his work for a warranty period of one (1) year from the date of final acceptance. If, at anytime during the warranty period, any leakage, cracking, loss of bond, or other discontinuity is identified, the Contractor shall make repairs acceptable and at no additional cost to the County.

END OF SECTION



**SECTION 02748**

**CURED-IN-PLACE PIPE (CIPP) FOR LATERAL CONNECTIONS**

**PART 1 - GENERAL**

**1.1 GENERAL**

- A. Work under this section shall provide for furnishing and installing a lateral liner, such as LMK T-Liner or Engineer approved equal.
- B. This specification covers requirements and test methods for the reconstruction of a sewer service lateral pipe and a short section of the main pipe without excavation. The lateral pipe shall be remotely accessed from the main pipe and from a cleanout. This shall be accomplished by the installation of a resin impregnated one-piece main and lateral lining by means of air inflation and inversion. The liner is pressed against the host pipe by pressurizing a bladder that is held in place until the thermo-set resins have cured. When cured, the liner shall extend over a predetermined length of the service lateral and a particular section of the main pipe as a continuous, one piece, tight fitting, corrosion resistant and verifiable non-leaking cured in-place pipe. The Main/Lateral Lining shall be in accordance with ASTM F2561-06 "Standard Practice for Rehabilitation of a Sewer Service Lateral and its Connection to the Main Using a One-Piece Main and Lateral Cured-in Place Liner".
- C. The reconstruction shall be accomplished using a non-woven textile tube of particular length and a thermo-set resin with physical and chemical properties appropriate for the application. The lateral tube located within a translucent inversion bladder is vacuum-impregnated with the synthetic resin and is then placed inside of a protective carrying device. The mainline portion of the liner is physically attached to the lateral portion and is affixed around a rigid "T" launching device. The protective "T" launching device is winched into the existing sewer. When the "T" launching device is properly positioned at the lateral connection, the mainline bladder is inflated by pressurized air that presses the main liner against the host pipe. The lateral portion is then, inverted up through the lateral service line by the action of the inversion bladder. Once the resin-saturated liner is cured, the inversion bladder and launching/carrying devices are removed.

**1.2 REFERENCE SPECIFICATIONS AND STANDARDS**

This specification references the following American Society for Testing and Materials (ASTM) Standard Specifications, American Water Works Association (AWWA) Specifications and their reference standards, which are made a part hereof by such reference and shall be the latest edition and revision thereof. All work shall comply with the reference standards unless specifically stated otherwise in this Specification.

- A. ASTM F2562 - Standard Specification for Steel Reinforced Thermoplastic Ribbed Pipe and Fittings for Non-Pressure Drainage and Sewerage
- B. ASTM F1216 - Standard Specification for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube
- C. ASTM F5813 - Standard Specification for Cured-In-Place Thermosetting Resin Sewer Piping Systems
- D. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
- E. ASTM D618 - Standard Practice for Conditioning Plastics for Testing

### **1.3 SUBMITTALS**

The Contractor shall submit the following:

- A. Manufacturer's literature showing size, materials, dimensions, and installation details, of the units to be provided.
- B. Qualifications documentation meeting the requirements of Section 1.4.A below.

### **1.4 QUALIFICATIONS**

- A. A qualified bidder for installing a mainline/lateral connection and lateral repair system shall use a Manufactured System that has a minimum of a five-year history of satisfactory performance and the Manufactured System shall have performed a minimum of 10,000 successful installations during this time period in the U.S., including 300,000 feet of lateral lining. Bidders shall be prepared to submit a list of installation projects, numbers of connections sealed and lateral footage lined providing contact names, addresses, and telephone numbers for reference.

### **1.5 MEASUREMENT AND PAYMENT**

- A. Payment for lateral liners shall be made at the unit price bid. The unit bid price for lateral liners shall be measured per each lateral rehabilitated with a liner. Payment will be full compensation for furnishing and installing the liner, appurtenances, mobilization and demobilization, lateral cleaning, pre- and post-installation CCTV lateral inspection, lining the first fifteen (15) feet of the lateral from the sewer main, and other site restoration, all other work specified, and all other incidentals to complete the Work.
- B. After the first fifteen (15) feet of lateral from the sewer, additional lateral lining shall be paid for per foot of liner installed on each lateral. Payment will be full compensation for furnishing and installing the liner, appurtenances, mobilization and demobilization, lateral cleaning, pre- and post-installation CCTV lateral

inspection, lining the lateral beyond the first fifteen (15) feet from the sewer main, and other site restoration, all other work specified, and all other incidentals to complete the Work.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- A. The liner assembly shall be continuous in length and consist of one or more layers of absorbent textile material i.e. needle punched felt, circular knit or circular braid that meet the requirements of ASTM F1216 and ASTM D5813 Sections 6 and 8. The textile tube and sheet shall be constructed to withstand installation pressures, have sufficient strength to bridge missing pipe segments, and flexibility to fit irregular pipe sections. The wet-out textile tube and sheet shall meet ASTM F 1216, 7.2 as applicable, and shall have a uniform thickness and 5% to 10% excess resin distribution that when compressed at installation pressures will meet or exceed the design thickness after cure.
- B. The outside layer of the textile tube (before inversion) and interior of the textile sheet shall be coated with an impermeable, translucent flexible membrane. The textile sheet before insertion shall be permanently marked as a “Lateral Identification” correlating to the address of the building and the lateral pipe services. The sheet and tube shall be surrounded by a second impermeable, flexible translucent membrane (translucent bladder) that will contain the resin and facilitate vacuum impregnation while monitoring of the resin saturation during the resin impregnation (wet-out) procedure.
- C. The mainsheet and lateral tube shall be a one-piece assembly formed in the shape of a “T” or WYE. No intermediate or encapsulated elastomeric layers shall be in the textile that may cause de-lamination in the cured in-place pipe. The main sheet will be flat with one end overlapping the second end and sized accordingly to create a circular lining equal to the inner diameter of the main pipe. The lateral tube will be continuous in length and the wall thickness shall be uniform. The lateral tube will be capable of conforming to offset joints, bells, and disfigured pipe sections.

### **2.2 RESIN SYSTEM**

- A. The resin/liner system shall conform to ASTM D5813 Section 8.2.2 - 10,000-hour test.
- B. The resin shall be a corrosion resistant polyester, vinylester, epoxy or silicate resin and catalyst system that when properly cured within the composite liner assembly, meets the requirements of ASTM F1216, the physical properties herein, and those which are to be utilized in the design of the CIPP, for this project.
- C. The resin shall produce CIPP, which will comply with the structural and chemical resistance requirements of ASTM F1216.

Table 1 CIPP INITIAL STRUCTURAL PROPERTIES

Property	ASTM Test	Minimum Value	
		Psi	(MPa)
Flexural Strength	D 790	4,500	(31)
Flexural Modulus	D 790	250,000	(1,724)

**2.3 DESIGN CONSIDERATIONS**

- A. The CIPP shall be designed per ASTM F1216, Appendix X1.
- B. The CIPP design for the lateral tube shall assume no bonding to the original pipe.

**2.4 MANUFACTURER**

- A. Lateral liners provided under this specification shall be equal to LMK Technologies, T-Liner, or Engineer approved equal.

**PART 3 EXECUTION**

**3.1 INSTALLATION RECOMMENDATIONS**

- A. Access Safety – Prior to entering access areas such as manholes, an excavation pit, performing inspection or cleaning operations, an evaluation of the atmosphere to determine the presence of toxic or flammable vapors or lack of oxygen shall be undertaken in accordance with local, state, or federal safety regulations.
- B. Cleaning and Inspection – Rockdale County Department of Water Resources specifications, Section 02742 Television-Sonar Inspection, and Section 02741 Sanitary Sewer Cleaning.
- C. Accessing the Lateral – A cleanout is required to be located on the exterior of the building. The cleanout fitting must be either TEE shaped or back to back WYE shaped where the lateral meets the cleanout riser pipe. The cleanout shall be located no less than within two (2) feet of the finished liner.
- D. Plugging – The upstream side of the cleanout shall be plugged during insertion and curing of the liner assembly ensuring no flows enter the pipe and no air, steam or odors will enter the building. When required, the main pipe flows will be by-passed. The pumping system shall be sized for normal to peak flow conditions. The upstream manhole shall be monitored at all times and an emergency deflating system will be incorporated so that the plugs may be removed at any time without requiring confined space entry. All flow control operations shall conform to Section 02740.
- E. Inspection of Pipelines – The interior of the pipeline shall be carefully inspected to determine the location of any condition that shall prevent proper installation, such as roots, and collapsed or crushed pipe sections. These conditions shall be noted.

Experienced personnel trained in locating breaks, obstacles, and service connections by closed circuit television shall perform inspection of pipelines.

- F. Line Obstructions – The existing service lateral shall be clear of obstructions that prevent the proper insertion and expansion of the lining system. Changes in pipe size shall be accommodated, if the lateral tube is sized according to the pipe diameter and condition. Obstructions may include dropped or offset joints of no more than 20% of inside pipe diameter.
- G. Resin Impregnation – The lateral tube and mainline sheet shall be encapsulated within the translucent bladder (liner/bladder assembly) shall be vacuum-impregnated with resin (wet-out) under controlled conditions. The volume of resin used shall be sufficient to fill all voids in the textile lining material at nominal thickness and diameter. The volume shall be adjusted by adding 5% to 10% excess resin for the change in resin volume due to polymerization and to allow for any migration of resin into the cracks and joints in the original pipe. No dry or unsaturated area in the mainline sheet or lateral tube shall be acceptable upon visual inspection.
- H. Liner Insertion – The lateral tube and inversion bladder will be inserted into the carrying device. The mainline liner and bladder shall be wrapped around the “T” launching device and held firmly by placing four (4) hydrophilic O-rings around the main liner. An adhesive sealant 300ml in volume is applied to the main/lateral interface and shall be applied as a two-inch (2”) wide band on the main liner. Both the launching and carrying device are pulled into the pipe using a cable winch. The pull is complete when the open port of the “T” launching device is aligned with the interface of the service connection and mainline pipe. The lateral tube is completely protected during the pull. The mainline liner is supported on a rigid “T” launcher that is elevated above the pipe invert through the use of a rotating skid system. The liner assembly shall not be contaminated or diluted by exposure to dirt, debris, or water during the pull.
- I. Bladder – The main bladder shall be inflated causing the main sheet to unwrap and expand, embedding the hydrophilic O-rings between the main liner and the main pipe as the main liner is pressed tight against the main pipe. The lateral tube is inverted by the action of the lateral bladder through the center of the main liner as it extends up into the lateral pipe to a termination point that shall be no less than 2-feet from the exterior cleanout. The Main/Lateral bladder assembly shall extend past all ends of the liner, as no cutting shall be required.
- J. Curing – After liner placement is complete; pressure is maintained pressing the liner firmly against the inner pipe wall. The liner is chemically cured at ambient temperatures or by a suitable heat source. The heating equipment shall be capable of delivering a mixture of steam and air throughout the liner bladder assembly to uniformly raise the temperature above the temperature required to cure the resin. The curing of the CIPP must take into account the existing pipe material, the resin system, and ground conditions (temperature, moisture level, and thermal conductivity of the

soil). The heat source temperatures shall be monitored and logged during the cure and cool down cycles. The manufacturer's recommended cure schedule shall be submitted.

- K. CIPP Processing – Curing shall be done without pressure interruption with air or a mixture of air and steam for the proper duration of time per the resin manufacturer's recommendations. When the heat source is removed and the temperature on both ends of the CIPP reaches 100 degrees Fahrenheit or less, the processing shall be finished.

### **3.2 FINISH**

- A. The finished CIPP – Shall be continuous over the entire length of the rehabilitated sewer service lateral and 16" of the main pipe (5" on either side of a 6" lateral or 6" on either side of a 4" lateral connection). The CIPP shall smooth with minimal wrinkling and increase flow rate. The CIPP shall be free of dry spots, lifts, and delaminated portions. The CIPP shall taper at each end providing a smooth transition for accommodating video equipment and maintaining proper flow in the mainline. After the work is completed, the installer will provide the Engineer with video footage documenting the repair and the visual markings identifying the sewer lateral address as completed work. The finished product must provide an airtight/watertight verifiable non-leaking connection between the main sewer and sewer service lateral.

### **3.3 RECOMMENDED INSPECTION AND TESTING PRACTICES**

- A. Sampling – As designated by the purchaser in the purchase agreement, the preparation of a CIPP sample is required. The sample shall be prepared by securing a flat plate mold using the textile tube material and resin system as used for the rehabilitated pipe.
- B. Pressure – The pressure applied on the plate sample will be equal to the highest pressure exerted on the lateral tube during the inversion process.
- C. Length – The minimum length of the sample must be able to produce at least five specimens for testing in accordance with ASTM D-790-03.
- D. Conditioning – Condition the test specimens at  $73.4 \pm 3.6^{\circ}$  F ( $23 \pm 2^{\circ}$ C) and  $50 \pm \%$  relative humidity for not less than 40 hour prior to test in accordance with Practice ASTM D 618, for those tests where conditioning is required.
- E. Short-Term Flexural (Bending) Properties – The initial tangent flexural modulus of elasticity and flexural stress shall be measured for gravity and pressure pipe applications in accordance with Test Method D 790 and shall meet the minimum requirements of Table 1.
- F. CIPP Wall Thickness – The minimum wall thickness at any point shall not be less than 87.5% of the specified design thickness as agreed upon between purchaser and seller.

- G. Gravity Pipe Leakage Testing – If required by the Engineer in the contract documents or purchase order, gravity pipes should be tested using an air test method where a test plug is placed adjacent to the upstream and downstream ends of the main sheet CIPP and at the upper most end of the lateral tube. This test should take place after the CIPP has cooled down to ambient temperature. This test is limited to pipe lengths with no service connections. The test pressure shall be 4 PSI for a three (3) minute test time and during this time the pressure shall not drop below 3.5 PSI.

### **3.2 WARRANTY**

- A. The Contractor shall guarantee his work for a warranty period of two (2) years from the date of acceptance. If, at any time during the warranty period, any leakage, or other defect is identified, the Contractor shall make repairs acceptable and at no additional cost to the County.

### **3.3 DOCUMENTATION**

- A. The Contractor shall complete work on each asset as assigned via the County's Computerized Work Order Management system. Upon start of work, the Contractor shall receive work orders as assigned by the Project Manager. The Contractor shall utilize the Mobile Work Manager to maintain and synchronize the status of each rehabilitation work order issued.

END OF SPECTION

**SECTION 02750**  
**INTERNAL MECHANICAL POINT REPAIR SEALS**

**PART 1 GENERAL**

**1.01 GENERAL**

- A. Work under this section shall provide for furnishing and installing Internal Mechanical Point Repair Seals, such as the QuickLock system or Engineer approved equal.
- B. The installation of mechanical point repair seals shall only be performed by manufacturer trained and approved personnel using equipment that have been is recommended and approved by the manufacturer.

**1.02 REFERENCE SPECIFICATIONS AND STANDARDS**

This specification references the following American Society for Testing and Materials (ASTM) Standard Specifications, American Water Works Association (AWWA) Specifications and their reference standards, which are made a part hereof by such reference and shall be the latest edition and revision thereof. All work shall comply with the reference standards unless specifically stated otherwise in this Specification.

- A. ASTM D1418 - Standard Practice for Rubber and Rubber Lattices-Nomenclature
- C. Comply with applicable provisions and recommendations of Rockdale County Department of Water Resources Standard Specifications.

**1.03 SUBMITTALS**

The Contractor shall submit the following:

Manufacturer's literature showing size, materials, dimensions, and installation details, of the units to be provided.

**1.04 MEASUREMENT AND PAYMENT**

- A. Payment for mechanical point repair seals shall be made at the unit price bid. The unit bid price for Mechanical Point Repair Seals shall be measured per each unit installed. Payment includes furnishing and installing the mechanical point repair seals, sewer bypass pumping, cleaning, pre- and post-construction televising, traffic control and all other equipment, labor, and other incidentals required to complete the Work.

**PART 2 PRODUCTS**



## **2.01 MATERIALS**

- A. Sleeve Body: Mechanical Point Repair Seals shall be for pipe sizes 6”-28”.
- B. Sleeve Body: High Grade Stainless Steel, Type V4A (US equivalent Type 316L).
- C. Compression Seal: EPDM rubber.

## **PART 3 - EXECUTION**

### **3.01 GENERAL**

- A. Mechanical point repair seal installations are to be performed only by trained and qualified personnel, using adequate and safe equipment.
- B. Mechanical point repair seal installations are to be performed in strict adherence with the manufacturer’s installation manual. The Contractor shall keep a copy of the installation manual on site all times during installation of the work.
- C. Prior to beginning the installation, verify that all the equipment and components involved are undamaged and in proper working condition.
- D. The Contractor shall use of only manufacturer-certified equipment, packers, and components.
- E. Pressure gauge must have the proper range setting (0 – 70psi).
- F. NEVER exceed the maximum packer pressure as indicated in the manufacturer’s installation manual.
- G. NEVER inflate the packer outside of a pipe – serious bodily injury or death may occur.
- H. The Contractor shall provide for control of sewage flows as needed to complete the work. Flow control shall be in accordance Section 02740.

### **3.02 POST INSTALLATION INSPECTION AND TESTING**

- A. A closed circuit television (CCTV) inspection shall be carried out in accordance with Section 02742 – Sanitary Sewer Television-Sonar Inspection after installation to establish that the lining has been installed as specified and all live junctions have been reinstated.
- B. The finished seal shall be free of defects that would affect long term strength or hydraulic performance.

### **3.03 DOCUMENTATION**

- A. The Contractor shall complete work on each asset as assigned via the County's Computerized Work Order Management system. Upon start of work, the Contractor shall receive work orders as assigned by the Project Manager. The Contractor shall utilize the Mobile Work Manager to maintain and synchronize the status of each rehabilitation work order issued.

### **3.04 WARRANTY**

- A. The Contractor shall guarantee his work for a warranty period of two (2) years from the date of acceptance. If, at any time during the warranty period, any leakage, or other defect is identified, the Contractor shall make repairs acceptable and at no additional cost to the County.

END OF SECTION

**SECTION 02763**

**POINT REPAIRS TO SANITARY SEWERS AND SERVICE LATERALS**

**PART 1 GENERAL**

**1.01 WORK THIS SECTION**

- A. The purpose of this section is to define types of methods of external point repairs to sanitary sewer and service laterals.

**1.02 REFERENCES**

- A. Codes, Specifications, and Standards:  
American National Standards Institute (ANSI)
- B. Testing and Materials Standards:  
American Society of Testing and Materials (ASTM)
- C. Specifications for Construction of Sewer Mains, Rockdale County Department of Public Utilities
- D. General Conditions for Rockdale County Construction Contracts, Rockdale County

**1.03 DEFINITIONS**

- A. Point repairs as used in these Specifications shall mean repair of a limited length (not full length) of existing sanitary sewer mains between two manholes and/or a portion of a service lateral between the sewer main and the facility it serves.

**1.04 Experience**

- A. Supervisor of the field crews performing these functions shall have the proper training in these types of equipment and activities and have a minimum of five (5) years experience in performing such assignments including safe work practices, etc.
- B. Field crew leaders performing these functions shall have the proper training in these types of equipment and activities and have a minimum of three (3) years experience in performing such assignments including safe working practices, etc.
- C. The Contractor shall provide the County with written documentation (certification) that the supervisor, field crew leader and all crewmembers responsible for these assignments have the proper training and the requisite experience.
- D. No crewmembers shall enter confined spaces without the necessary certified training and at least one-year experience

## **1.05 MEASUREMENT AND PAYMENT**

- A. Payment for point repairs shall be made at the unit bid price. A point repair made by the excavating, removal of the existing pipe, replacement with PVC pipe or other acceptable material, backfilling, and surface restoration shall include repair of up to 10 linear feet including manhole connection, if required. Payment will be full compensation for furnishing all materials, labor, tools, traffic control, and equipment necessary to perform all work. Payment for point repair shall be made under Point Repairs, Unpaved Area, Pipe Diameter, Depth of Cut, per each.
- B. Payment for point repairs over 10 feet of length shall be made at the unit bid price. Payment will be full compensation for furnishing all materials, labor, tools, traffic control, and equipment necessary to perform all work. Payment for each foot of a point repair over 10 feet in length shall be made under Point Repairs, Unpaved Area, Pipe Diameter, Pipe Material, Per LF over 10 Feet, Depth of Cut, per linear foot. This payment will be in addition to the payment for the point repair up to 10 feet of length.
- C. Payment for point repairs being made with DIP in-lieu-of PVC pipe shall be made at the unit bid price. Payment will be full compensation for furnishing all materials, labor, tools, and equipment necessary to perform all work. Payment for point repair made with DIP in-lieu-of PVC pipe shall be made under Point Repairs, Unpaved Area, Pipe Diameter, DIP as an extra, per linear foot. This payment will be in addition to the payments for the point repair up to 10 feet of length and over 10 feet of length.
- D. Payment for point repairs made with the shrinkwrap type product shall be paid at the unit price bid per point repair. Payment will be full compensation for furnishing all materials, labor, tools, traffic control, and equipment necessary to perform all work. Payment for the heat shrinkwrap type point repair shall be made under Point Repairs, External Joint/Point Repair (shrinkwrap), Unpaved Area, Pipe Diameter, Depth of Cut, per each.
- E. Service lateral reconnection and/or replacements to sewer mains shall be performed in accordance with the requirements of Section 02726 Sanitary Sewer Service Lateral Reconnections and Replacements.
- F. No separate measurement or payment shall be made for foundation backfill, when required by the County to stabilize the bottom of an unstable trench bottom, the same being considered incidental to the Work.

## **PART 2 PRODUCTS**

### **2.01 PIPE MATERIAL**

- A. The Contractor shall use ductile iron pipe conforming to the requirements of the Rockdale County Water and Wastewater Standards and Specifications for construction of sewer mains and ductile iron repairs.

- B. The Contractor shall use PVC pipe conforming to the requirements of the Specifications for Construction of Sewer Mains, Rockdale County Department of Public Utilities, for PVC pipe repairs.

## **2.02 ELASTOMERIC COUPLINGS**

- A. Elastomeric couplings for connecting replacement pipe to existing pipe shall be those approved by the County.
- B. Elastomeric couplings shall be fastened by two stainless steel adjustable clamps, type C-305 or approved equal, to form a watertight seal.

## **2.03 HEAT SHRINK SLEEVE**

- A. The Contractor shall submit Manufacturers information to the County, for approval, of the material the Contractor intends to use for heat shrink sleeves. An example of heat shrink sleeve is “Wrapidseal” as manufactured by Canusa.
- B. The sleeve Manufacturer shall verify, in writing, to the County that the Contractor is properly certified in the installation of this material.
- C. The Contractor shall document their experience in this point repair method, including the experience of supervisor and field crew leader.
- D. The contractor shall document other projects where they have performed this type of work including number of point repairs, pipe sizes, owner, and references.
- E. The width of the sleeve will be dependent on the nature of the external joint/point repair. The width of the sleeve will be directed by the County.

# **PART 3 EXECUTION**

## **3.02 PREPARATION**

- A. The Contractor shall establish the locations of existing utilities prior to excavation. All protection required to prevent damage to existing utilities shall be provided by the contractor.
- B. Site preparation shall be performed as required. When the repairs are to be made on sewers or facilities lying under paved surfaces, those surfaces shall be removed as required for point repairs of the particular size pipe involved (trench width plus two feet for concrete surfaces) unless otherwise acceptable to the County.
- C. The Contractor shall provide all the material and equipment necessary to perform wastewater flow control.

- D. The Contractor shall dewater, sheet and/or brace all excavations as specified in the Specifications for Construction of Sewer Mains, Rockdale County Department of Public Utilities.
- E. Traffic control shall be provided in accordance with the Specifications for Construction of Sewer Mains, Rockdale County Department of Public Utilities.
- F. All activities shall be performed in accordance with the manufacturer's recommendations and regulations established by OSHA. Particular attention shall be drawn to those safety requirements involving working with scaffolding and entering confined spaces.

### **3.02 METHOD OF REPAIR**

- A. The Contractor shall replace a sufficient length of pipe to ensure that defective pipe is removed and replaced up to a length, per repair, of 10 feet.
- B. If the length of the required replacement segment, up to a length of 10 feet per repair, is not adequate to replace the defective pipe, the Contractor, at the County's option, may be directed to replace additional length of pipe such that the defective pipe is replaced.
- C. The Contractor shall replace service taps encountered within the point repair using the material specified. All service shall be replaced with wyes. Any defective service laterals encountered within the point repair shall be repaired under this specification or in accordance with Section 02726, Sanitary Sewer Service Lateral Reconnections and Replacement.
- D. When a pipe defect can be repaired using shrinkwrap the Contractor will request County approval to do so.
- E. Any service lateral or competent main line pipe broken by the Contractor shall be replaced at the Contractor's expense.
- F. The Contractor shall remove any fences, base materials, storm sewer, etc. that may interfere with the repair made at each specified point. The Contractor is responsible for the replacement of said fences, base materials, storm sewer etc., in the equal or better condition than found.
- G. The bottom of the trench shall be reshaped so that the grade of the pipe replaced will match that required for the existing sewer line. The point repair shall be backfilled in accordance with the Specifications for Construction of Sewer Mains, Rockdale County Department of Public Utilities.
- H. If the material in the bottom of the trench is of such consistency that it is not stable, then the Contractor shall stabilize the bottom of the trench by placing suitable materials at the direction of the County.
- I. Prior to backfilling, the County shall inspect point repairs. After backfilling, point repairs shall be internally televised by the Contractor for final approval by the County. The cost of the TV inspection is included in the bid unit price for the point repair.

### **3.03 DOCUMENTATION**

- A. The Contractor shall complete work on each asset as assigned via the County's Computerized Work Order Management system. Upon start of work, the Contractor shall receive work orders as assigned by the Project Manager. The Contractor shall utilize the Mobile Work Manager to maintain and synchronize the status of each rehabilitation work order issued.

### **3.04 WARRANTY**

2. The contractor shall guarantee his work for a warranty period of 1 year from the date of final acceptance by the county. If, at any time during the warranty period, any leakage, cracking, loss of bond, or other discontinuity is identified, the contractor shall make repairs acceptable to the county and at no additional cost to the county.

END OF SECTION

## **DIVISION 3 – CONCRETE**

### **SECTION 03000 Reinforced Concrete**

#### **PART 1 GENERAL**

##### **1.01 WORK INCLUDED**

Concrete, forms, placing of sleeves, pipes, and anchor bolts, finishing, curing, and all equipment and incidentals necessary to do all the concrete work as shown on the drawings or specified.

##### **1.02 REFERENCE STANDARDS**

All work hereunder shall comply with the following except as called for otherwise herein:

- A. ACI Standard 301- Latest Revision Specifications for Structural Concrete for Buildings.
- B. ACI Standard 318 - Latest Revision Building Code Requirements for Reinforced Concrete.
- C. ACI Standard 306R - Latest Revision Cold Weather Concreting.
- D. ACI Standard 305R - Latest Revision Hot Weather Concreting.
- E. ACI Standard 304R - Latest Revision Guide for Measuring, Mixing, Transporting and Placing Concrete.

##### **1.03 SUBMITTALS**

- A. Shop Drawings: Submit complete Shop Drawings including:
  - 1. Location of all proposed construction joints, keying, and water stops.
  - 2. Location of all openings, depressions, construction and control joints, trenches, sleeves, inserts, and other items affecting the reinforcement and placing of concrete.
- B. Product data: Submit complete product data on the following:
  - 1. Complete materials list of items proposed to be furnished and installed under this section.
  - 2. Complete information on cement source of supply, physical and chemical



characteristics, transportation and intermediate terminating procedures for mill-to-site handling, and site storage procedures.

3. Complete information on aggregate procurement, processing, and storage.
  4. Complete information on proposed batching and mixing equipment and procedures, including water chilling or other devices or systems to reduce mix temperatures.
  5. Complete information on concrete handling equipment proposed to be used, including capacities, for chutes, pumps, tremies, buckets, and all other equipment.
  6. Complete description of proposed curing materials and methods.
  7. Complete mix designs.
  8. Remolded joint filler.
  9. Waterstops.
  10. Wedge inserts.
  11. Expansion bolts.
  12. Anchor bolts.
  13. Foundation bolts.
  14. Admixtures.
  15. Hardening and dust-proofing compounds.
  16. Form ties.
  17. Any gang forming information.
- C. Do not begin concrete production until all products and mix designs have been reviewed and approved by the Engineer.

#### **1.04 CLASSIFICATION**

- A. The following classes of concrete are included in these specifications and shall be used where specified herein or called for on the plans:
- B.

	Class "A" Concrete	Class "B" Concrete
Cement content - Minimum number of sacks (94 lb.) per cubic yard	6	5
Maximum water to cement ratio (gal. Water per sack cement)	5.1	6.5
Entrained air	3% - 6%	3% - 6%
Minimum Superplasticizer content per 100 lbs. of cement	45 oz.	0 oz.
Minimum 7 day compressive strength	2,400 psi	1,400 psi
Minimum 28 day compressive strength	4,000 psi	2,500 psi

- B. In the absence of contrary designation, concrete used for all construction shall be Class "A."

## PART 2 PRODUCTS

### 2.01 CEMENT

Unless otherwise specified or shown on the plans, concrete shall be made with the Portland cement conforming to A.S.T.M. Specification C-150, Type I. The lightest colored Portland cement, competitively available shall be used, and the same brand of cement shall be used throughout the entire project. High early strength Portland cement shall conform to A.S.T.M. Standard Specification #C-150, Type III.

### 2.02 AGGREGATES

- A. General: All aggregates shall conform to requirements of ASTM C 33.
- B. Fine Aggregate
1. The fine aggregate shall consist of clean, hard, durable, uncoated particles of sand. It shall be free from dust mica, shale, alkali, organic matter, loam, soft or flaky particles.
  2. Deleterious Substances - The fine aggregate shall contain not more than one percent (1%) by weight of clay lumps of more than three percent (3%) by weight of material removed by decantation.
  3. Grading - Fine aggregate shall conform to the following requirements:

<u>Total Passing</u>	<u>Percent by Weight</u>
3/8" sieve	100
No. 4 sieve	95 - 100
No. 16 sieve	45 - 95
No. 50 sieve	10 - 30
No. 100 sieve	2 - 8

4. Tests - Fine aggregate shall be subjected to the Colorimetric test for organic impurities and if it produces a color darker than the standard, it shall be rejected. It shall conform in all other respects to A.S.T.M. Designation C-33.

C. Coarse Aggregate

1. Composition and Quality - Coarse aggregate shall be washed gravel or crushed stone and shall consist of hard, tough, uncoated, durable particles. It shall contain no vegetable matter or soft, flaky, thin, or elongated particles. Deleterious substances shall not exceed the following amounts:

Soft fragments	0.20%
Coal and lignite	0.25%
Clay lumps	0.25%
Material passing No. 200 Sieve	1.50%
Thin or elongated pieces (length greater than 5 times the average thickness)	10.00%

The percentage of wear, by the Los Angeles test, shall not exceed 45.

2. Grading - Coarse aggregate shall be well graded between the limits specified below, and shall conform to the limits shown in the following table:

<u>Total Passing</u>	<u>Percent by Weight</u>
2" Sieve	100
1-1/2" Sieve	90 - 100
1" Sieve	55 - 80
3/4" Sieve	35 - 70
1/2" Sieve	20 - 45
3/8" Sieve	10 - 30
No. 4 Sieve	0 - 15
No. 16 Sieve	0 - 1

## 2.03 WATER

The water used in mixing concrete shall be fresh, clean, potable and free from oil, acid, alkali, organic matter, and deleterious amounts of chloride ion.

## 2.04 CONCRETE ADMIXTURES

- A. Admixtures shall conform to ASTM C494; Type F for high range water-reducing and Type G for high range water-reducing/set-retarding. Air entraining agents shall

conform to ASTM C260. When more than one admixture is used the two products shall be compatible and have a single manufacturer.

- B. All Class "A" Concrete shall contain a (Daracem - 100 or an alternate approved by the Engineer) high range water-reducing agent. The dosage of the high range water reducing agent shall be at least 8 oz./100 lbs. of cement, but shall not produce a plasticized slump greater than 8". The high range water reducing agent shall be added at the site prior to concrete placement.
- C. Admixtures, if not specified, may be used only upon written approval of the Engineer and shall be used only as recommended by the Manufacturer. Admixtures shall, when added to the mixture, produce a concrete of specified strength in both 7 and 28 day tests. Documentary evidence of acceptability will be required when new or unknown admixtures are proposed for usage.
- D. Admixtures shall be Grace Construction Products or an alternate approved by the Engineer.

## **2.05 FORM WORK**

- A. Forms shall result in a final structure which conforms to the shape, lines, and dimensions of the members as required by the plans and specifications, and shall be substantial and sufficiently tight to prevent leakage of mortar. They shall be properly braced or tied together so as to maintain position and shape. Forms and their supports shall be designed so that previously placed structure will not be damaged.

Form ties shall be so designed that when the forms are removed no metal shall be within 1-1/2 inches of the finished surface. Form ties shall have an approved type waterstop that is an integral part of the tie and made of the same material as the tie. Gang form ties shall be filled from one end with a compressible plug a minimum of 1 1/2 inches from the edge of wall, shall have a bentonite plug in the center of the wall and all voids filled with non-shrink grout. Removal of forms and shores - no construction loads exceeding the dead load plus live load shall be supported on any unshored portion of the structure under construction. No construction loads shall be supported on, nor any shoring removed from, any part of the structure under construction except when that portion of the structure in combination with the remaining forming and shoring system has sufficient strength to support safely its weight and the loads placed thereon. This strength may be demonstrated by job-cured test specimens and by a structural analysis considering the proposed loads in relation to these test strengths and the strength of the forming and shoring system. Such analysis and test data shall be furnished by the contractor to the Engineer when so required. In no case shall forms for walls or columns be removed in less than 36 hours. Form work supporting weight of concrete, such as beams and slabs shall remain until the concrete has attained a minimum of the 28 day design strength.

- B. The design and engineering of the form work, as well as its construction, shall be the responsibility of the Contractor. Except as specifically called for otherwise herein, all

form work shall meet the "ACI Standard Recommended Practice for Concrete Form work (ACI 347 - Latest Revision)".

- C. Chamfer: Unless shown otherwise, form chamfers with 3/4" x 3/4" strips, accurately formed and surfaces to produce uniformly straight lines and tight edge joints on exposed concrete. Extend terminal edges to required limit and miter chamfer strips at changes in direction. All exposed corners shall be chamfered.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

- A. Before the placing of any concrete, the footing trenches shall be drained of water and mud film removed and any loose dirt lifted out. Any flow of water shall be diverted by side drains to a sump, or removed by other approved methods, while the concrete is being placed.
- B. Before placing concrete in any forms, the forms shall be cleaned, and all debris shall be removed. All reinforcing shall be checked to be sure that no reinforcing is touching the form or pan sides.
- C. Before placing any concrete, it shall be determined that all work that is to be built into the concrete work is located and installed. All such items shall be placed so as not to interfere with the reinforcing steel.
- D. Wood board forms shall be soaked with water just before the concrete is poured.
- E. Special measures shall be taken in both severe cold and hot weather and shall be in accordance with ACI Recommended Practice (ACI 306 - Latest Revision and ACI 605 - Latest Revision).
- F. Before placing any new concrete on or against concrete which has set, the existing surfaces shall be thoroughly roughened and cleaned of all foreign matter and "Laitance." Forms shall be retightened and the existing surfaces slushed with a coat of grout. The new concrete shall be placed immediately after grouting, and the work shall be performed in such manner as to insure complete bonding of newly poured concrete to the existing work.

Grout for construction joints shall consist of a mixture of neat cement and water, and shall be applied to the old concrete surface immediately before the new concrete is poured. Grout for setting column bases, wall plates, and beams shall be composed of one part Portland Cement two parts sand, and sufficient water to produce the consistency required.

- G. Where excavations exceeding a depth of five feet are prescribed to be made to install the foundations or any part of the structure, or any retaining walls on the site, the back slope of such excavation shall be at an incline not exceeding one vertical to one and

one-half horizontal unless such back slope is sheeted and braced. If sheeting and bracing is to be provided, such sheeting and bracing shall be designed by an Engineer registered in the project state. The cost of such design work shall be paid for by the Contractor.

### **3.02 MIXING AND DELIVERY**

- A. Machine Mixing: All mixing of concrete shall be done in a batch mixer of approved design, which will insure a uniform distribution of the material throughout the mass, so that the mixture is uniform in color and homogenous. The entire content of the mixer drum shall be discharged before recharging. All material to be mixed per batch shall not exceed the manufacturers' rated capacity of the mixer.
- B. Time of Mixing: The mixing of each batch shall continue not less than one and one-half (1-1/2) minutes after all the materials, including water, are in the mixer, during which time the mixer shall rotate at a peripheral speed of about two hundred feet per minute.
- C. Mixing at Central Plant: Concrete mixed in a central plant, shall be conveyed to the work in approved mixer trucks which mix the concrete in route to the work. Plant layout and equipment shall meet the approval of the Engineer. Loading tickets shall be initialed and the time of loading stamped thereon. The loading tickets shall be handed to the resident inspector on the work before the load is placed, and no concrete will be accepted which has been in the mixer truck more than one and one-half (1-1/2) hours after the water has been added. In all other respects, ready-mixed concrete shall conform to A.S.T.M. Specification C-94.
- D. Waste concrete shall be deposited and mix trucks washed out only in areas designated by the owner or the engineer.

### **3.03 SLUMP**

- A. The maximum slump allowed for the various types of construction are as follows:

<u>Type of Construction</u>	<u>Maximum Slump</u>
Reinforced Foundation Walls & Footings	4"
Slabs, Beams, Reinforced Walls & Columns	4"
Heavy Mass Construction	2"
All Concrete Plasticized by Admixtures	8"

- B. Slump tests shall be made at the discretion of the Engineer, and concrete having greater slump than specified shall not be incorporated into the work. The Contractor shall furnish slump test cones conforming to the provisions of ASTM C-143.

### **3.04 PLACING CONCRETE**

- A. All concrete shall be placed in daylight, and any portion of the concrete work started shall be started so that it can be completed in daylight. No concrete shall be placed until the foundation, forms, false-work, and the placing of the steel have been approved by the Engineer. Approval by the Engineer in no manner relieves the Contractor of his obligation to produce finished concrete as required by the plans and specifications.
- B. The concrete shall be placed in such a manner as to avoid the possibility of segregation or separation of the aggregates, or the displacement of the reinforcement steel. The concrete shall be placed as near its final resting place as possible. If pipes, troughs, or chutes are used in placing the concrete, they shall be so arranged and used that the concrete is not separated, and shall be kept clean and free of hardened concrete at all times. Troughs and chutes shall be either made of metal or shall be metal lined, and shall extend as nearly as possible to the point of deposit. In walls and columns, the concrete shall not be dropped more than five feet (5') without the use of a tremie. Concrete shall be placed in continuous horizontal layers, approximately 10" to 12" thick, and the batches shall follow each other so closely that each one is placed and compacted before the preceding one has taken an initial set. Succeeding layers shall be placed before the underlying layer has become set, and shall be compacted in a manner that will entirely break up and obliterate the tendency to produce a cold joint between layers. Concrete in beams, girders, columns and walls shall be well spaded at the form surface and all concrete shall be compacted by an approved mechanical type vibrator having a frequency of not less than 3,000 vibrations per minute. The Contractor shall provide the necessary number of vibrators to properly execute the work, and shall have on the job at all times necessary spare vibrators to be used in case of mechanical failure. Construction joints shall be made only at the location as shown on the plans, except by approval of the Engineer.
- C. In making construction joints, the previous work shall be cleaned of all "laitance," and other objectionable material, and shall be brushed with a thin mixture of Portland cement and water immediately before the new concrete is placed.
- D. The operation of placing and compacting the concrete, shall be conducted so as to form a compact, dense, impervious artificial stone of uniform texture, with smooth faces on exposed surfaces. Any section of concrete that is porous, or has been plastered, or is otherwise defective, shall be removed and replaced, in whole or in part, entirely at the contractor's expense, as directed by the Engineer.
- E. Depositing Concrete Under Water: Concrete shall not be exposed to the action of water before setting, or deposited in the water, except upon the approval of the Engineer, and under his supervision.
- F. Cold Weather Placing

1. Comply with ACI 306 to protect all concrete work from physical damage and reduced strength which would be caused by frost, freezing actions, or low temperatures. No concrete shall be placed when the atmosphere temperature is below 40 degrees F.
  2. If the temperature drops below 40 degrees F. after the concrete has been placed, the Contractor shall provide adequate means for maintaining concrete temperature of not less than 45 degrees F. for a period of five (5) days after the concrete is placed. The contractor shall assume all risk connected with placing concrete in cold weather, and any unsatisfactory work will be rejected. Recording thermometers shall be supplied by the contractor as required by the Engineer.
- G. Hot Weather Placing: When hot weather conditions exist which would seriously impair the quality and strength of concrete, place the concrete as follows:
1. Maintain concrete temperature at time of placement below 90 degrees F. Use chilled mixing water or chopped ice to control concrete temperature, provided the water equivalent of the ice is calculated to the total amount of water.
  2. Cover reinforcing steel with water-soaked burlap if the steel becomes too hot. Steel temperature shall not exceed the ambient air temperature immediately prior to placement of concrete.
  3. Wet forms thoroughly prior to placement of concrete.
  4. Use set-control admixtures in the mix subject to approval of the Engineer.

### **3.05 PROTECTION AND CORRECTIVE WORK**

- A. Workmen shall not walk on concrete during placing or finishing with any earth or foreign matter footgear.
- B. All freshly placed concrete shall be protected from damage or injury due to water, falling objects, persons or anything that might mar or injure the finish surface of the concrete. Any surfaces that are damaged shall be removed and replaced with fresh concrete at the expense of the Contractor.
- C. Care shall be taken in the removal of the forms not to damage the surface of the concrete. Immediately after the forms are removed, all damaged or imperfect work shall be patched. If in the opinion of the Engineer, the patching does not restore the work to the quality specified, the Contractor shall remove and rebuild the work at his expense.
- D. Where concrete or concrete work does not conform to these specifications and where patching is not approved by the Engineer or low strength concrete is not permitted to remain in place, procedures and plans covering all work to be rebuilt shall be



submitted by the Contractor to the Engineer before removal and rebuilding is begun. The cost of such plans, as well as the cost of removal and rebuilding shall be at the Contractor's expense.

### **3.06 FINISHING**

Floors, including slabs on ground, shall be finished as follows:

- A. The surfaces of all concrete shall be worked with a wood float in a manner which will compact the concrete and produce a surface free of depressions or inequalities of any kind. Test for grade (of level) and correct by removing excess or adding and compacting additional concrete.
- B. All interior floor slabs shall receive steel trowel finish as follows: After screeding, slab shall be wood floated to a smooth, plane surface. When concrete has hardened, to prevent excess fines from working to surface, steel trowel to a smooth surface free from defects. A second steel troweling shall be done producing a plane, hard, dense, finished surface. Interior slabs shall also receive a hardening and dust proofing treatment of a colorless aqueous solution of zinc or magnesium fluosilicate applied in strict accordance with manufacturer's recommendations.
- C. Troweling shall not begin until all surface water has disappeared. The drying of the surface moisture before troweling must proceed naturally and must not be hastened by sacking or dusting on of dry sand and cement.
- D. After exterior floors, platforms and steps requiring a broom finish are struck off smooth with a wood float and received a trowel finish, slightly roughen the concrete surface by brooming in the direction perpendicular to the main traffic route. Use a fiber bristle broom.
- E. Exposed concrete surfaces shall be finished as follows:
  - 1. The exterior surfaces of all concrete shall be thoroughly worked during the placing operation, by the use of a concrete spade of approved type. The working shall force all coarse aggregate from the faces, and work mortar against the forms to produce a smooth finish, free from water and air pockets, or honeycomb. As soon as the concrete has set sufficiently to permit, the forms shall be carefully removed and all depressions resulting from removal of the metal spacers, and all other holes and rough places, shall be carefully pointed with a mortar composed of one part cement and two parts sand. The surface film of all such pointed surfaces shall be carefully removed before setting occurs. The cement in the mortar used for pointing and filling holes shall be of the same brand as the cement incorporated in the concrete work.
  - 2. Surface shall be rubbed smooth with carborundum brick or other abrasive within 36 hours after forms are removed. Surfaces shall be wetted and rubbed until a uniform color and texture is produced. No cement grout or slush shall

be used other than the cement paste drawn from the green concrete itself by the rubbing process.

G. Unless otherwise directed the following schedule shall be used for concrete finishing:

Sidewalks:	Rough (Broomed)
Exposed Exterior Walls:	Medium (Rubbed)
Interior Structure Walls:	Fine (Rubbed)
Additional Wall Finish:	ThoroCoat applied per manufacturer's recommendations
Slabs - Interior:	Smooth (Troweled)
Slabs - Exterior:	Medium (Fine broomed)

Coordinate the required finish with the Engineer prior to application.

### **3.07 CURING**

A. Curing Materials

1. Liquid curing and sealing compounds shall conform to ASTM C 309, Type 1.
2. Sheet materials shall conform to ASTM C 171.
3. Burlap cloth made from jute and weighing approximately 9 oz. per sq. yd for moist curing shall conform to AASHTO M 182 and shall use two layers.
4. Compounds shall be a combination sealer-hardener and dust-proofer.

B. Procedure

Freshly placed concrete shall be protected from wash caused by rain and flowing water. Concrete shall not be allowed to dry out from the time it is placed until seven (7) days thereafter. Curing shall be accomplished by the use of an approved membrane compound to seal the water in the concrete except for surfaces which are to receive future concrete, or mortar. The membrane shall be of a type which will retain ninety-seven (97%) percent of the moisture at a temperature of 135 degree F., with a relative humidity of thirty percent (30%) in the first twenty-four (24) hours. It shall be applied in accordance with the manufacturer's recommendations and in sufficient thickness to effectively hold the water in the concrete, and must have a record of successful use for at least two years.

### **3.08 JOINTS**

A. Construction Joints:

1. Construction joints will not be permitted except as may be shown on the Drawings and on the Contractor's approved placement schedule.

2. If construction joints necessary for the progress of the Work are not shown on the Drawings, show them in complete detail on the Shop Drawings.
3. Provide keyways at least 1-1/2" deep where shown on the plans.

B. Isolation joints in slabs on grade:

Provide isolation joints in slabs on grade at points of contact between slabs on grade and vertical surfaces where indicated.

### **3.09 WATER TIGHTNESS**

All structures for holding or carrying water, or pits below grade shall be watertight. Where the order of work requires "cold" joints (slab/wall intersections etc.), an approved, rigid waterstop shall be secured to the form work and remain imbedded in the concrete to form a watertight joint with the adjacent pour. Waterstop shall be expandable center bulb type 6 in. wide x 1/4 in. thick minimum unless otherwise specifically shown on the Plans.

### **3.10 TESTING OF CONCRETE**

- A. Testing of concrete will be done under the direction of a laboratory approved by the Engineer. Tests to be paid for by the Contractor.
- B. Samples for strength tests will be taken not less than one per day nor less than once per one hundred (100) cubic yards and on less yardage when required by the Engineer. The tests shall be made in accordance with the procedure set forth in A.S.T.M. C172 for "Standard Method of Making and Storing Compression Test Specimens of Concrete in the Field", and C-39 for "Standard Methods of Test for Compressive Strength Concrete." Tests shall be made by a recognized laboratory approved by the Engineer.

Three certified copies of test results are to be furnished the Engineer with each test. Each test shall consist of at least four specimens, two for field control and two for laboratory control. Each set of four cylinders shall have a numerical designation and each cylinder an alphabetical sub-designation. Thus the first set of four cylinders shall be numbered 1A, 1B, 1C, and 1D.

- C. If the evaluation of the compressive test indicates the concrete has failed to meet the specified strength, core tests shall be made of the in-place concrete. The location and number of such tests to be at the Engineers direction. Tests shall be paid for by the Contractor.
- D. If the core tests fail to verify the strength specified, the Engineer shall effect one of the following procedures:

1. Have the Contractor remove and reconstruct that portion of the structure found to be defective.
  2. Accept the concrete in place and issue a change order as set forth in the General Conditions of these specifications.
- E. Tests to determine the entrained air content will be made at the job site. Frequency of testing shall be at the Engineer's discretion as necessary to ensure proper air content. The testing apparatus shall be furnished by the Contractor, concrete supplier or testing laboratory at no cost to the Owner, and testing will be performed by the Contractor in the presence of the Engineer.

END SECTION

**SECTION 03200**  
**Concrete Reinforcement**

**1.00 DESCRIPTION**

- A. Work Included: Provide complete, in place, all steel required for reinforcement of cast-in-place concrete as shown on the drawings.

**1.01 SUBMITTALS**

- A. Shop Drawings: Submit complete shop drawings of all material proposed to be furnished and installed under this Section.
1. Show schedules, stirrup spacing, diagrams of bent bars and arrangement and assemblies.
  2. Make Shop Drawings in accordance with ACI 315.
- B. Mill Certificates: Accompanying the Shop Drawings, submit steel producer's certificates of mill analysis, tensile and bend tests for reinforcing steel.

**1.02 PRODUCT HANDLING**

- A. Delivery: Deliver reinforcement to the job site bundled, tagged and marked. Use tags indicating bar size, lengths, and other information corresponding to markings shown on placement diagrams.
- B. Storage: Store reinforcement above the surface of the ground on wooden platforms or other supports in a manner which will prevent damage and accumulation of dirt and excessive rust. The surface of the ground beneath all stored reinforcement shall be covered with plastic sheeting to further assure isolation from dirt and dust.

**2.00 MATERIALS**

- A. Reinforcing bars: Comply with ASTM A615-Latest Revision.
- B. Welded wire fabric: Comply with ASTM A185-Latest Revision.
- C. Supports for reinforcement: Bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcement in place:
1. Use wire bar type supports complying with CRSI recommendations, unless otherwise indicated. Do not use wood, brick and other unacceptable materials.
  2. For slabs on grade, use supports with sand plates or horizontal runners where

base material will not support legs.

3. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with either hot-dip galvanized or plastic protected legs.

## **2.01 FABRICATION**

- A. General: Fabricate reinforcing bars to conform to required shapes and dimensions, with fabrication tolerances complying with CRSI Manual. In case of fabricating errors, do not rebend or straighten reinforcement in a manner that will injure or weaken the material.
- B. Unacceptable Materials: Reinforcement with any of the following defects will not be permitted in the work.
  1. Bar lengths, depths and bends exceeding specified fabrication tolerances.
  2. Bend or kinks not indicated on Drawings or final Shop Drawings.
  3. Bars with reduced cross-section due to excessive rusting or other cause.

## **3.01 INSPECTION**

Examine the foundation, formwork and the conditions under which concrete reinforcement is to be placed, and correct conditions which would prevent proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

## **3.02 INSTALLATION**

- A. General
  1. Comply with the specified standards for details and methods of reinforcement placement and supports, and as herein specified.
  2. Clean reinforcement to remove loose rust and mill scale, earth and other materials which reduce or destroy bond with concrete.
  3. Position, support and secure reinforcement against displacement by formwork, construction or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers and hangers as required.
  4. Place reinforcement to obtain the minimum coverage for concrete protection. Arrange, space and securely tie bars and bar supports together with 16 gage wire to hold reinforcement accurately in position during concrete placement operations. Set wire ties so that twisted ends are directed away from exposed

concrete surfaces.

5. Install welded wire fabrics in as long lengths as practicable. Lap adjoining pieces at least one full mesh.
  6. Provide sufficient numbers of supports and of strength to carry reinforcements. Do not place reinforcing bars more than 2" beyond the last leg of any continuous bar support. Do not use supports as bases for runways for concrete conveying equipment and similar construction loads.
- B. Splices: Provide standard reinforcement splices by lapping ends, placing bars in contact, and tightly wire tying. See splice schedule on Drawings. Bars marked continuous shall be lapped as required by splice schedule, and at corners, corner bars shall be provided.

### **3.03 BAR COVER**

Reinforcing bars shall be fabricated, tied and supported to ensure a protective concrete cover as shown on the structural drawings.

END OF SECTION

## **DIVISION 15 – MECHANICAL**

### **SECTION 15066 High-Density Polyethylene (HDPE) Pipe and Fittings**

#### **PART 1 - GENERAL**

##### **1.01 DESCRIPTION**

Scope of Work: Provide and install high-density polyethylene (HDPE) pipe and fittings of the sizes and in the locations shown on the Drawings and as specified for use in directional drilling.

##### **1.02 STANDARDS**

- A. Pipe 1/2-inches (13-mm) through 3-inches (76-mm) shall conform to AWWA C901 and the Specifications.
- B. Pipe and fittings 4-inches (102-mm) through 60-inches (1,524-mm) shall conform to AWWA C906 and the Specifications.

##### **1.03 SHOP DRAWINGS AND SUBMITTALS**

- A. Submittals shall be submitted to the PM/CM for review and acceptance prior to construction in accordance with the General Conditions and Section 01300 "Submittals."
- B. Submit manufacturers recommended method for butt-fusing joints.
- C. The polyethylene pipe manufacturer shall provide certification that stress regression testing has been performed on the specific product. Certification shall include a stress life curve per ASTM D2837.
- D. Provide certification that the material is listed by the Plastic Pipe Institute in PPI TR-3 with a hydrostatic design basis of 1,600-psi (11 MPa) at 73°F. The PPI listing shall be in the name of the pipe manufacturer and shall be based on ASTM D2837 and PPI TR-3 testing and validation of samples of the pipe manufacturer's production pipe.
- E. The manufacturer's certification shall state that the pipe was manufactured from 1 specific resin in compliance with these Specifications. The certificate shall state the specific resin used, its source, and list its compliance to these specifications.
- F. Submit certified lab data to verify specified physical properties. Certify that tests are representative of pipe supplied for this project.



- G. Submit affidavit of compliance with referenced standards (e.g., AWWA C901, C906, etc.).
- H. Submit qualification certificates for operators of heat fusion equipment.

#### 1.04 INSPECTION

All materials and installation furnished under this specification are subject to inspection by the PM/CM.

#### 1.05 QUALITY AND WORKMANSHIP

- A. The pipe and fitting manufacturer's production facilities shall be open for inspection by the PM/CM. During inspection, the manufacturer shall demonstrate that the facilities are capable of manufacturing the pipe and fittings required by this specification, that a quality control program meeting the minimum requirements of ASTM D3035 and ASTM F714 is in use, and that facilities for performing the tests required by this specification are in use.

#### 1.06 DELIVERY, STORAGE, AND HANDLING

- A. On site pipe storage shall meet all manufacturers' requirements.
- B. Transport individual pipe lengths to the job site on padded bunks with nylon tie-down straps or padded bonding to protect the pipe. Coiled HDPE pipe shall be stored in a manner to ensure safety. Protect the pipe from sharp objects. Anchor pipe securely to prevent slippage.
- C. Store individual pipe lengths on earth berms or timber cradles in the numerical order of installation. Stack the heaviest series of pipe at the bottom. Do not stack pipe in excess of 20-rows high.
- D. Protect the pipe from stones and sharp objects.
- E. Store fittings in their original cartons.
- F. Lift pipes with handling beams or wide belt slings near the middle of joints as recommended by the pipe manufacturer. Do not use cable slings, chains, or hooks.
- G. Before installation, check pipe and fittings for cuts, scratches, gouges, buckling, kinking, or splitting. Remove any pipe section containing defects by cutting out the damaged section in a complete cylinder.

## PART 2 - PRODUCTS

### 2.01 PIPE

- A. Pipe shall have ductile iron pipe size OD. The pipe supplied shall be DR 17 for the gravity sewer main, in accordance with Table 5 of AWWA C906. The pipe shall be homogenous throughout and free of visible cracks, holes, voids, foreign inclusions, or other deleterious defects and shall be identical in color, density, melt index, and other physical properties throughout.
- B. Pipe shall have a minimum hydrostatic design basis (HDB) of 1,600-psi (11 MPa), as determined in accordance with ASTM D2837.
- C. Pipe Material
1. Pipes shall be marked in accordance with AWWA requirements (C901 Section 2.4 or C906 Section 3.1, as appropriate).
  2. AWWA C901 pipe (1/2-inch through 3-inches) shall be colored blue for water, purple (Pantone 522C lavender) for reclaimed water, and green for wastewater. AWWA C901 pipe shall be as manufactured by Endot Endopure or equal.
  3. AWWA C906 pipe (4-inches through 60-inches) shall be color coded as above with 4 co-extruded equally spaced stripes of the same material as the pipe. Stripes printed on the pipe outside surface shall not be acceptable.
  4. Materials used for the manufacture of polyethylene pipe and fittings shall be very high molecular weight, high-density ethylene/hexene copolymer PE 3408 polyethylene resin meeting the requirements of Table 15066-1.

**Table 15066-1  
Physical Property and Pipe Performance Requirements**

<u>Property</u>	<u>Specification</u>	<u>Units</u>	<u>Minimum Values</u>
Material Designation	PPI/ASTM	---	PE3408
Material Classification	ASTM D1248	---	III C 5 P34
Cell Classification	ASTM D3350	---	345434C
Hardness	ASTM D2240	Shore D	64
Compressive Strength (Yield)	ASTM D695	psi	1,600
Tensile Strength @ Yield (Type IV Spec.)	ASTM D638 (2%/min)	psi	3,200
Elongation @ Yield	ASTM D638	%, min	8
Tensile Strength @ Break (Type IV Spec.)	ASTM D638	psi	3,500
Elongation @ Break	ASTM D638	%, min.	600
Modulus of Elasticity	ASTM D638	psi	110,000
ESCR:			
(Cond A, B, C: Mold. Slab)	ASTM D1693	Fo, Hrs	Fo>5,000
(Compressed Ring)	ASTM F1248	F50, Hrs	F50>1,000
Slow Crack Growth	Battelle		Fo>32

	<u>Method</u>	<u>Days to Failure</u>	<u>Minimum Values</u>
Impact Strength (IZOD) (0.125-inch thick)	ASTM D256 (Method A)	in-lb/in Notch	42
Linear Thermal Expansion Coef	ASTM D696	in/in/°F	1.2 x 10-4
Thermal Conductivity	ASTM C177	BTU, in/ Ft2/hrs/°F	2.7
Brittleness Temp	ASTM D746	°F	<-180
Vicat Soft. Temp	ASTM D1525	°F	+257
NSF Listing	Standard 61	---	Listed

Note: \* Standard deviation 0.01.

5. The pipe shall be extruded from pre-compounded resin. In-plant blending of resin is unacceptable.

## 2.02 NIPPLES AND FLANGED STUB ENDS

Short nipples and stub ends shall be of the same material as the HDPE pipe.

## 2.03 FITTINGS

- A. Fittings shall be made from material meeting the same requirements as the pipe. Fittings shall be fabricated by the manufacturer of the pipe.
- B. Fittings shall meet the appropriate AWWA standard for the size involved (C901 or C906).
- C. Molded fittings shall be manufactured in accordance with ASTM D3261 and shall be so marked.
- D. Mechanical fittings, when used, shall be specifically designed for, or tested and found to be acceptable for use with HDPE pipe.
- E. Fittings used to connect with dissimilar pipe materials shall be provided as per Section 15062 "Ductile Iron Pipe and Fittings."

## 2.04 JOINTS

- A. Sections of polyethylene pipe shall be joined into continuous lengths on the job site above ground. The joining method shall be the butt fusion method and shall be performed in strict accordance with the pipe manufacturer's recommendations. The butt fusion equipment used in the joining procedures shall be capable of meeting all conditions recommended by the pipe manufacturer.
- B. Butt fusion joining shall result in joint weld strength equal to or greater than the tensile strength of the pipe. Socket fusion shall not be used. Extrusion welding or

hot gas welding of HDPE shall not be used. Flanges, unions, grooved-couplers, transition fittings, and some mechanical couplers may be used to connect HDPE pipe mechanically without butt-fusion only where shown in the Drawings.

C. Ductile Iron to HDPE Connections

1. Flanged connections between ductile iron pipe or fittings and HDPE pipe or fittings shall meet all requirements of Section 15062 "Ductile Iron Pipe and Fittings."
2. Mechanical joint connections between ductile iron pipe or fittings and HDPE pipe or fittings shall use ductile iron mechanical joint glands conforming to AWWA C111 and AWWA C153. Mechanical joints shall be fully thrust restrained. Gaskets, bolts, and hexagonal nuts shall be standard rubber gaskets conforming to AWWA C111. Follower gland shall match class 350 compact fittings.
3. HDPE pipe stiffeners shall be constructed of stainless steel and shall be flanged on one end to prevent over-insertion into the receiving pipe.

**2.05 LOCATION DETECTION WIRES**

- A. Materials: Two continuous, insulated 10-gauge copper wires.
- B. Installation: Wires shall be attached to the centerline of the HDPE pipe every 5-feet. Wires shall terminate at top of each valve box and be capable of extending 12-inches (305-mm) above the top of the box in a manner so as not to interfere with valve operation.

**PART 3 - EXECUTION**

**3.01 HEAT FUSION**

- A. Use fusion equipment specially designed for heat fusion of HDPE. The equipment utilized shall be regulated for the different melt strength materials. Compatibility fusion techniques shall be used when polyethylene of different melt indexes are fused together.
- B. Use the following procedure to butt fused HDPE pipe. If a procedure noted below contradicts manufacturer's recommendations, follow the manufacturer's recommendation.
  1. Maintain the proper temperature of the heater plate as recommended by the pipe manufacturer. Check it with a tempilstik or pyrometer for correct surface temperature.
  2. Clean pipe ends inside and outside with a clean cotton cloth to remove dirt, water, grease, and other foreign materials.

3. Square (face) the pipe ends using the facing tools on the fusion machine. Remove all burrs, chips, and fillings before joining pipe or fittings.
4. Check the line-up of pipe ends in the fusion machine to see that pipe ends meet squarely and completely over the entire surface to be fused. The clamps shall be tight so that the pipe does not slip during the fusion process.
5. Insert the clean heater plate between the aligned ends and bring the ends firmly in contact with the plate but do not apply pressure while achieving the melt pattern. Allow the pipe ends to heat and soften. Softening depths shall be per the manufacturer's recommendation.
6. Carefully move the pipe ends away from the heater plate and remove the plate (if the softened material sticks to the heater plate, discontinue the joint, clean heater plate, square pipe ends, and start over).
7. The melted ends shall be connected rapidly but not slammed together. Apply enough pressure to form a double rollback bead to the body of the pipe around the entire circumference of the pipe about 1/8-inch (3.175-mm) to 3/16-inch (4.763-mm) wide. Pressure is necessary to cause the heated material to flow together.
8. Allow the joint to cool and solidify properly. Remove the pipe from the clamps and inspect the joint appearance.

### **3.02 OPERATIONS INCIDENTAL TO JOINT COMPLETION**

- A. Plan joint completion to accommodate temporary test bulkheads for hydrostatic testing on the day of installation.

### **3.03 ASSEMBLING JOINTS**

#### **A. Flanged Joints**

1. Flange adapters shall be pressure rated the same as the pipe. Flange adapters shall be heat fused to the pipe as outlined in the heat fusion section.
2. Gaskets shall be used between the polyethylene flange adapters when recommended by the HDPE pipe manufacturer. Sufficient torque shall be applied evenly to the bolts to prevent leaks. After initial installation and tightening of flanged connections, allow the connections to set for a few hours then conduct a final tightening of the bolts.
3. Lubricate nuts and bolts with oil or graphite prior to installation.
4. Check operation of valves connected to molded stub end flange adapters. Insert polyethylene spacer if recommended by pipe manufacturer for clearance.

## B. Mechanical Joints

1. Wipe the socket and the plain end clean. Lubrication and additional cleaning should be provided by brushing both the gasket and plain end with an approved pipe lubricant just prior to slipping the gasket onto the plain end for joint assembly. Place the gland on the plain end with the lip extension toward the plain end, followed by the gasket with the narrow edge of the gasket toward the plain end.
2. Insert the pipe into the socket and press the gasket firmly and evenly into the gasket recess. Keep the joint straight during assembly.
3. Push the gland toward the socket and center it around the pipe with the gland lip against the gasket. Insert bolts and hand tighten nuts. Make deflection after assembly but before tightening bolts.
4. Tighten the bolts to the normal range of bolt torque as indicated in AWWA C-600 while maintaining approximately the same distance between the gland and the face of the flange at all points around the socket.
5. When connection is being made to HDPE pipe or fittings use a welded flange to connect to fittings.

### 3.04 INSTALLATION

#### A. Installation of High-Density Polyethylene Pipe

1. All high-density polyethylene (HDPE) pipe shall be handled, stored, assembled, and installed in accordance with AWWA C906, manufacturer's recommendations, and these Specifications.

#### B. Installation of HDPE Service Connections

1. HDPE AWWA C901 (1/2-inch through 3-inch) water and reclaimed water service connections crossing roads shall be installed in a PVC casing pipe. PVC casing pipe may be installed by push/pull (reaming) methods as approved by the County. PVC casing pipe shall be Schedule 40 and meet the requirements of ASTM D1785. PVC fittings shall be Schedule 40 and shall meet the requirements of ASTM D2466. Casing pipe/carrier pipe size shall be as follows:

Carrier Pipe (Nominal Dia.)	Casing Pipe (Nominal Dia.)			
	Size	O.D	Wall	I.D
1-inch	2-1/2-inches	2.875	0.203	2.469
1-1/4-inch	3-inches	3.50	0.216	3.068
1-1/2-inch	3-1/2-inches	4.00	0.226	3.548
2-inch	4-inches	4.5	0.237	4.026

2. Casing pipe shall be air pressure tested for leaks immediately upon completion of each crossing at a minimum test pressure of 20-psi (.138 MPa).
3. Following installation of carrier pipe within casing, install a plug in each open end of casing. Plugs shall be suitable for restraining against external earth load.

### 3.05 HYDROSTATIC TESTING

- A. Perform hydrostatic testing for leakage following installation in accordance with manufacturer's written recommendations. Testing prior to installation is optional and may be performed at the Contractor's expense.

END OF SECTION

**SECTION 15062**  
**Ductile Iron Pipe and Fittings**

**PART 1 GENERAL**

**1.01 DESCRIPTION**

- A. Provide all materials labor and equipment as required to, install, test and place in satisfactory service all ductile iron pipe, ductile iron pipe fittings, wall pipes and sleeves, special fittings, gaskets, bolts and accessories and all comparable cast iron fittings at the locations specified, shown on the Drawings or as otherwise directed by the PM/CM.

**1.01 QUALITY ASSURANCE**

- A. Qualifications of Installer:

1. For the actual fabrication, installation and testing of work under this Section, use only thoroughly trained and experienced workmen completely familiar with the items required and the manufacturers' current recommended methods of installation.
2. In acceptance or rejection of installed work, the PM/CM will make no allowance for lack of skill on the part of the workmen.

- B. Reference Standards:

1. American Society of Testing Materials (ASTM)
2. American National Standards Institute (ANSI)
3. American Water Works Association (AWWA)
4. American Standards Association (ASA)

**1.02 SUBMITTALS**

Submit the following in accordance with Section 01300 of these specifications:

- A. Complete list of all materials proposed to be furnished and installed under this Section.
- B. Certification from the manufacturer of the product that the products meet all the requirements of these Specifications, including manufacturers name and address included with all submittals.



- C. Shop drawings showing all details of the proposed installations, including locations for all pipe and fittings embedded in concrete, under slabs and in the earth.

### **1.03 PRODUCT HANDLING**

- A. Protection

Use all means necessary to protect the materials of this Section before, during and after installation and to protect the work and materials of all other trades.

- B. Storage

Provide a covered storage area for stockpiled products.

- C. Replacements

In the event of damage, immediately make all repairs and replacements necessary to the approval of the PM/CM and at no additional cost to the Owner.

## **PART 2 – PRODUCTS**

### **2.01 GENERAL**

Ductile iron pipe and fittings shall conform to the referenced standards and specifications. All ductile iron pipe and special fittings will be subject to inspection and approval by the PM/CM after delivery. No broken, cracked, misshaped, imperfectly coated or otherwise damaged or unsatisfactory pipe or fittings shall be used.

### **2.02 DUCTILE IRON PIPE**

- A. General:

All gravity sewer pipe 6-inches and larger shall be ductile iron pipe unless otherwise noted. All water mains 6-inches and larger shall be ductile iron pipe unless otherwise noted. All sewage force mains 4-inches and larger shall be ductile iron pipe unless otherwise noted.

- B. Design:

1. Design in accordance with ANSI A21.51 (AWWA C151).
2. Standard Thickness Class – Class 51 for push-on and MJ pipe and Class 53 for flanged pipe, unless otherwise specified.
3. Pipe shall be fully gauged per AWWA Standards.

4. Water and sewer pipe and fittings shall be standard cement lined in accordance with ANSI A21.40 (AWWA C104) and sealed with an approved bituminous seal coat. Interior service ductile iron pipe shall be coated with a paint primer.

C. Pipe Joints:

1. Push-on Joint – Conform to ANSI A21.11 (AWWA C111).
2. Mechanical Joint – Conform to ANSI A21.11 (AWWA C111).
3. Flanged Joint – Conform to ANSI A21.10 (AWWA C110) for cast-on flange or ANSI A21.15 (AWWA C115) for threaded-on flanges.
4. Restrained joint pipe - bolted joint type, or modified push-on type with joint restraint using ductile iron components. Restrained joint pipe where required shall be American, U.S. Pipe or equal. The use of locking type gaskets may be allowed where the Engineer deems appropriate.

### **2.03 FITTINGS, GENERAL**

- A. Provide appropriate gaskets for mechanical or flange joints. Gaskets for flange joints shall be made of 1/8-inch thick cloth reinforced rubber; gaskets may be ring type or full face type.
- B. Provide the necessary bolts for mechanical or flange connections. Mechanical or flange connections shall be steel with American regular unfinished heads. Bolts shall conform to ASTM A 307, Grade 2. Nuts shall be steel with American Standard regular hexagonal dimensions, all as specified in AMSI B 17.2, and AWWA C111. All bolts and all nuts shall be treated in accordance with ANSI B 1.1, Coarse Thread Series, Class 2A and 2B fit.

### **2.04 PIPE FITTINGS (EXTERIOR)**

A. General:

4-inch and larger buried fittings shall be ductile iron with mechanical joints unless otherwise specified and/or indicated on the drawings.

B. Design:

1. Design in accordance with ANSI A21.11 (AWWA C111).
2. Fittings shall be a minimum 250 psi pressure class rating.

C. Provide mechanical joints on fittings in conformance with ANSI A21.11 (AWWA C111).

## **2.05 PIPE FITTINGS (INTERIOR)**

### **A. General:**

4-inch and larger diameter fittings exposed or in building interiors shall be ductile iron with flanged joints unless otherwise specified and/or indicated on the Drawings.

### **B. Design:**

1. Design in accordance with ANSI A21.11 (AWWA C111).
2. Fittings shall be minimum 250 psi pressure rating.
3. Fittings shall meet the same specifications as ductile iron pipe stated in Paragraph 2.02.B of this Section. Fitting exteriors shall be coated with a shop prime.

### **C. Pipe Fitting Joints:**

Provide flanged joints on fittings in conformance to ANSI A21.10 (AWWA C110) for cast-on flange or ANSI A21.15 (AWWA C115) for thread-on flange. Flanges shall be drilled in conformance with ANSI B16.31 Class 125.

## **PART 3 - EXECUTION**

### **3.01 PIPE LAYING AND INSTALLATION**

- A. Excavation and backfilling of trenches shall conform to the requirements of Section 02225.
- B. Installation of ductile iron pipe in underground pressure piping systems shall conform to the requirements of AWWA C600. Unless otherwise indicated on the Drawings, underground piping shall have a minimum cover of 48 inches above the top of pipe and trench width no less than the pipe diameter plus 24 inches.
- C. Proper and suitable tools and equipment for the safe and convenient handling and laying of pipe shall be used. Great care shall be taken to prevent pipe coatings or wrappings from being damaged, particularly the cement and/or polyurethane interior linings. All pipe shall be carefully examined for cracks and other defects, and no pipe or fittings shall be laid which are known to be defective. If pipe or fittings are discovered to be cracked, broken or defective after being laid, they shall be removed and replaced with sound material at no additional expense to the Owner. All pipe and fittings shall be thoroughly cleaned before being laid, and shall be kept clean until accepted in the completed work.

- D. Pipeline alignment and gradient shall be straight or shall follow true curves as near as practicable.
- E. Excavation, cleaning, laying, jointing and backfilling shall be kept up as closely as possible so as to progress the work in a uniform workmanlike manner. In no case shall pipe be left in the trench overnight without completing the jointing. The completed pipeline shall not be left exposed in the trench unnecessarily. The Contractor shall backfill and compact the trench as soon as possible after laying and jointing is completed. Each day at the close of work, at all times when laying is not in progress, the exposed end of the pipeline in the trench shall be closed with an approved bulkhead of wood or metal. If at any time it becomes necessary to cover the end of an uncompleted pipeline with backfill, the end of that pipe shall be closed with a mechanical joint plug.
- F. The Contractor shall clean each joint of pipe while it is suspended before it is lowered into the trench. The Contractor shall keep exposed ends of pipe properly plugged during laying to prevent dirt and other materials from entering the line, and shall, before the system is accepted, thoroughly clean all lines.
- G. Interior ductile iron piping systems shall be furnished and installed, complete, as indicated on the Drawings, as specified or as required for proper operation of equipment.

**3.02 JOINTING**

- A. General:

The Contractor shall include in his bid a sum sufficient to cover the cost of the field services of experienced and qualified representatives of the manufacturers whose products are approved for the work to instruct the Contractor's personnel in the proper jointing procedure to be used to secure the best possible joints with the materials selected.

**3.03 FIELD TESTING**

- A. Pressure pipelines shall be subject to hydrostatic pressure leakage tests at a pressure of 1.5 times the maximum field working pressure of the pipeline. The pressure shall be maintained for a minimum of two hours. Procedures shall conform to AWWA C600, except as otherwise specified herein. Testing shall be made in the presence of the PM/CM.
- B. All piping shall be securely anchored and restrained against movement prior to application of test pressures. Prior to the pressure test, pipe laid in trenches shall be fully backfilled during the test, and all air shall be expelled from all pipes. All joints, fittings and valves shall be left open where possible. All exposed pipe, fittings, valves and joints shall be carefully examined during the pressure test.

- C. After all tests on any section have been completed to the satisfaction of the PM/CM, the Contractor shall carefully clean, blow out and drain the line of all water to prevent freezing. The Contractor shall also demonstrate to the satisfaction of the PM/CM that any and all lines are free from obstructions and foreign material.
- D. The Contractor shall bear the complete cost of the tests, including set-up, labor, temporary piping, blocking, gauges, bulkheads, water, air, soap solutions and all other materials required to conduct the tests.

END OF SECTION