



COUNTY OF GALVESTON

Bacliff Villas Drainage Restoration Bacliff, Texas

TECHNICAL SPECIFICATONS

HUITT-ZOLLARS

Huitt-Zollars, Inc.
TBPE Firm Registration #F-761
10350 Richmond Avenue, Suite 300
Houston, Texas 77042
291-496-0066

100% Construction Documents
October 15, 2019

Document 000100

TABLE OF CONTENTS

SPECIFICATIONS

NOTE: The Specifications referenced in bold below for TxDOT are Included in <https://ftp.txdot.gov/pub/txdot-info/cmd/cserve/specs/2014/standard/specbook-2014.pdf>. These TxDOT Specifications are not included in this project manual and are incorporated herein by reference for all purposes as if set out verbatim.

DIVISION 1 - GENERAL REQUIREMENTS

SPEC. NO.	TITLE	SOURCE
011000	Summary of Work	Huitt-Zollars
013300	Submittal Procedures	Huitt-Zollars
023210	Cement Stabilized Sand	Huitt-Zollars
025050	HDPE Solid and Profile Wall Pipe	Huitt-Zollars
026310	Storm Sewers	Huitt-Zollars
027260	CCFRPM Pipe for Sliplining Installation	Huitt-Zollars
027270	CCFRPM Pipe for Direct Bury Installation	Huitt-Zollars

TxDOT ITEM NO.	TITLE	SOURCE
1 Special Provision	Definition of Terms	Galveston County
1	Definition of Terms	TxDOT
2 Special Provision	Instructions to Bidders	Galveston County
2	Instructions to Bidders	TxDOT
3 Special Provision	Award and Execution of Contract	Galveston County
3	Award and Execution of Contract	TxDOT
4 Special Provision	Scope of Work	Galveston County
4	Scope of Work	TxDOT
5 Special Provision	Control of the Work	Galveston County
5	Control of the Work	TxDOT
6 Special Provision	Control of Materials	Galveston County
6	Control of Materials	TxDOT
7 Special Provision	Legal Relations and Responsibilities	Galveston County
7	Legal Relations and Responsibilities	TxDOT
8 Special Provision	Prosecution and Progress	Galveston County
8	Prosecution and Progress	TxDOT

TxDOT ITEM NO.	TITLE	SOURCE
9 Special Provision	Measurement and Payment	Galveston County
9	Measurement and Payment	TxDOT
104	Removing Concrete	TxDOT
160	Topsoil	TxDOT
400	Excavation and Backfill for Structures	TxDOT
420	Concrete Substructures	TxDOT
464	Reinforced Concrete Pipe	TxDOT
465	Junction Boxes, Manholes, and Inlets	TxDOT
496	Removing Structures	TxDOT
500	Mobilization	TxDOT
502 Special Provision	Barricades, Signs, and Traffic Handling	Huitt-Zollars
502	Barricades, Signs, and Traffic Handling	TxDOT
506	Temporary Erosion, Sedimentation, and Environmental Controls	TxDOT
530	Intersections, Driveways, and Turnouts	TxDOT

END OF DOCUMENT

SECTION 011000

SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Specification Sections, apply to this Section.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- A. The work included in this project will be authorized under one notice to proceed (NTP) issued in writing by the Owner. The Contractor shall have ten (10) calendar days to commence work upon issuance of the NTP. The contract duration time for Contractor to obtain substantial completion is one hundred eighty (180) calendar days.
- B. The work includes, but is not limited to, sawcutting; selective demolition; removal and disposal of reinforced concrete pavement, concrete curb, inlets, and soil; reinforced concrete paving and curb; storm sewer including sliplining and inlets, earthwork; pavement markings; signage; traffic control and sod.
- C. The bid proposal includes one (1) alternate individual bid item that involves removing and replacing 24 inch pipe using open trench near homeowner's house foundation that will be in lieu of installation of 20 inch CCFRPM. This alternate bid item will only be performed at the direction of the Engineer should the mandrel not pass through the storm sewer pipes as shown on the construction plans. Galveston County reserves the right to award a contract based upon adding the quantity for the additional individual bid item from unit prices bid under alternate bid item to the base bid amount that total up to the available construction budget of \$ 800,000.00.
- D. Galveston County reserves the right to reject any and all bids and to waive informalities in bids received. The award shall be based and made to the lowest responsible bidder based on a comparison of the Total Base Bid Amounts
- E. Owner for the Project is Galveston County, 722 21 St, Galveston, Texas 77550.
- F. Contract Documents were prepared for the Project by Huitt-Zollars, Inc., 10350 Richmond Ave, Suite 300, Houston, Texas 77042.

1.3 WORK SEQUENCE

- A. Traffic sequence shown on the drawing is based on the construction from downstream to upstream.
- B. Contractor shall secure all applicable permits at no cost to the Owner.
- C. Contractor shall notify Owner at 409-770-5552 at least 48 hours prior to any construction commencing.
- D. Contractor shall contact Huitt-Zollars, Inc. at 281-496-0066 at least 48 hours prior to construction.

1.4 CONTRACTOR USE OF PREMISES

- A. General: Contractor shall be responsible for application, payment, and receipt of all permits required to conduct activities involved with the project.
- B. Use of the Site: Contractor shall confine construction operations to areas within contract limits indicated or as coordinated with the Owner. Do not disturb portions of the site beyond the areas in which the Work is indicated.
 - 1. Owner Occupancy: Allow for Owner accessibility and maintain traffic as required by the sequence of construction. Keep driveways, entrances and streets near the project area clear and available to traffic at all times. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
 - 2. Contractor shall be responsible for traffic control in accordance with Texas Manual for Uniform Traffic Control Devices.
 - 3. Contractor shall maintain access to driveways at all times during construction.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 011000

SECTION 013300

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUBMITTAL PROCEDURES

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
1. Complete all submittals within 45 days after the Notice to Proceed date.
 2. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 3. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
 4. Coordinate all submittals requiring finish and/or color selections so that they are submitted close together and early. The County cannot make color/finish selections until all selection samples are provided for proper color/finish coordination. All color/finish selections will be made at the same time on a single list of selections and/or color board.
 - a. The Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.
 5. Processing: To avoid the need to delay installation as a result of the time required to process submittals, allow sufficient time for submittal review, including time for resubmittals.
 - a. Allow 1 week for initial review. Allow additional time if the Engineer must delay processing to permit coordination with subsequent submittals, or if several large submittals are submitted at or close to the same time.
 - b. If an intermediate submittal is necessary, process the same as the initial submittal.
 - c. Allow 1 week for reprocessing each submittal.
 - d. No extension of Contract Time will be authorized because of failure to transmit submittals to the Engineer sufficiently in advance of the Work to permit processing.
 - e. The Contractor may indicate on his transmittal any preferred sequence of review or if a later submittal should supersede an earlier submittal.
- B. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.
1. Provide a space approximately 4 by 5 inches (100 by 125 mm) on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken.
 2. The Engineer will return submittals without review if the Contractor has not previously reviewed the submittal and included his review stamp and comments.

SUBMITTAL PROCEDURES

3. When a submitting entity requests specific information on the submittal concerning site and project conditions, or field measurements, the Contractor shall provide that information prior to submitting to the Engineer. If it pertains to information, such as field dimensions, which are not available at the time of the submittal, the added information must be copied to the Engineer when available.
 4. Include the following information on the label for processing and recording action taken.
 - a. Project name.
 - b. Date.
 - c. Name, address and telephone/fax number of the Engineer.
 - d. Name, address and telephone/fax number of the Contractor.
 - e. Name address and telephone/fax number of the subcontractor.
 - f. Name, address and telephone/fax number of the supplier.
 - g. Name of the manufacturer.
 - h. Submittal identification number.
 - i. Number and title of appropriate Specification Section.
 - j. Drawing number and detail references, as appropriate.
- C. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from the Contractor to the Engineer using a transmittal form. The Engineer will not accept submittals received from sources other than the Contractor.
1. On the transmittal, record relevant information and requests for data. Identify submittal by I.D. number and specification section number and name. On the form, or separate sheet, record deviations from Contract Document requirements, including variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.
 2. Note on the transmittal and specifically flag on drawings or data sheets any proposed substitution to manufacturers or products listed in the contract documents.
 3. Transmittal Form: Use a form which includes the same data and information.

1.2 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Prepare a fully developed, horizontal bar-chart-type, contractor's construction schedule. Submit within 14 days after the Notice to Proceed date.
1. Provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week.
 2. Within each time bar, indicate estimated completion percentage. As Work progresses, place a contrasting mark in each bar to indicate Actual Completion.
 3. Prepare the schedule on a sheet, or series of sheets, of stable transparency, or other reproducible media, of sufficient width to show data for the entire construction period.
 4. Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on the schedule with other construction activities; include minor elements involved in the sequence of the Work. Show each activity in proper sequence. Indicate graphically the sequences necessary for completion of related portions of the Work.
 5. Coordinate the Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittal Schedule, progress reports, payment requests, and other schedules.

SUBMITTAL PROCEDURES

6. Indicate completion in advance of the date established for Substantial Completion. Indicate Substantial Completion on the schedule to allow time for the Engineer's procedures necessary for certification of Substantial Completion.
 7. Incorporate into the time base an allowance for normal or average rainfall for each month if the activity would be affected by rainfall.
- B. **Work Stages:** Indicate important stages of construction for each major portion of the Work, including submittal review, testing, and installation.
- C. **Area Separations:** Provide a separate time bar to identify each major construction area for each major portion of the Work. Indicate where each element in an area must be sequenced or integrated with other activities.
- D. **Distribution:** Following response to the submittal, print and distribute copies to the Engineer, County, subcontractors, and other parties required to comply with scheduled dates. Post copies in the Project meeting room and temporary field office.
1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.
- E. **Schedule Updating:** Revise the schedule after each meeting, event, or activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.

1.3 SUBMITTAL SCHEDULE

- A. After development and acceptance of the Contractor's Construction Schedule, prepare a complete schedule of submittals. Contractor shall submit the schedule to the Engineer within 21 calendar days of the Notice to Proceed date.
1. Coordinate Submittal Schedule with the List of Subcontracts and the Contractor's Construction Schedule.
 2. Prepare the schedule in chronological order. Provide the following information:
 - a. Submittal identification number.
 - b. Scheduled date for the first submittal.
 - c. Related Section number.
 - d. Submittal category (Shop Drawings, Product Data, or Samples).
 - e. Name of the subcontractor.
 - f. Description of the part of the Work covered.
 3. Allow time for resubmittals and reviews.
- B. **Distribution:** Following response to the initial submittal, print and distribute copies to the Engineer, County, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the Project meeting room and field office.
1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.
- C. **Schedule Updating:** Revise the schedule after substantial impact revisions have been recognized or made. Issue the updated schedule within 3 days following a revision.

1.4 SHOP DRAWINGS

- A. Submit newly prepared information drawn accurately to scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents or listed acceptable manufacturers/products. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not a Shop Drawing.
- B. Shop Drawings include fabrication and installation Drawings, setting diagrams, schedules, patterns, templates and similar Drawings. Include the following information:
 - 1. Dimensions.
 - 2. Identification of products and materials included by sheet and detail number.
 - 3. Compliance with specified standards.
 - 4. Notation of coordination requirements.
 - 5. Notation of dimensions established by field measurement.
 - 6. Sheet Size: Except for templates, patterns and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 24 by 36 inches .
 - 7. Submittal: Submit one correctable, translucent, reproducible print and three blue- or black-line prints for the Engineer's review. The Engineer will return the reproducible print.
 - 8. Do not use Shop Drawings without Engineer's review stamp indicating "No Exceptions Taken" or "Make Corrections Noted".
- C. Distribution: Furnish one set of prints of final submittal to County, installer, subcontractor, supplier, manufacturer, fabricator, and others required for performance of construction activities. Show distribution on transmittal forms. Retain one copy for each Operations and Maintenance Manual where required. Include Engineer Review Stamp and any comment made.
 - 1. Do not proceed with installation until a set of prints is in the Installer's possession.
 - 2. Do not permit use of unmarked prints of Shop Drawings in connection with construction.

1.5 PRODUCT DATA

- A. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information, such as manufacturer's installation instructions, catalog cuts, standard color samples, roughing-in diagrams and templates, standard wiring diagrams, and performance curves.
 - 1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products that are not required, mark copies to indicate the applicable information. Include the following information:
 - a. Manufacturer's printed recommendations.
 - b. Compliance with contract documents.
 - c. Compliance with trade association standards.
 - d. Compliance with recognized testing agency standards.
 - e. Application of testing agency labels and seals.
 - f. Notation of dimensions verified or to be verified by field measurement.
 - g. Notation of coordination requirements.

SUBMITTAL PROCEDURES

2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed by Contractor.
 3. Failure to mark applicable information as noted above, will be cause for rejection. Only marked items will be considered and reviewed.
- B. Submittals: Contractor shall submit 4 copies of each required submittal. The Engineer will retain three and will return one copy marked with action taken and corrections or modifications required.
1. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal, if properly marked.
- C. Distribution: Furnish one photocopy of final submittal to County, installer, subcontractor, supplier, manufacturer, fabricator, and others required for performance of construction activities. Show distribution on transmittal forms. Copy only the applicable pages. Retain one copy for each Operations and Maintenance Manual where required. Include Engineer Review Stamp and any comment made.
1. Do not proceed with installation until a copy of Product Data is in the Installer's possession.
 2. Do not permit use of unmarked copies of Product Data in connection with construction.

1.6 ENGINEER'S ACTION

- C. Except for submittals for the record or information, where action and return is required, the Engineer will review each submittal, mark to indicate action taken, and return it to the Contractor.
1. Compliance with specified characteristics is the Contractor's responsibility.
- D. Action Stamp: The Engineer will stamp each submittal with a uniform, action stamp. The Engineer will mark the stamp appropriately to indicate the action taken, as follows:
1. If returned "Contractor Has Not Approved", Contractor shall review the submittal, mark or make notation as applicable, affix the Contractor's review stamp, sign and date the stamp and then resubmit.
 2. If returned "No Exceptions Taken", Contractor shall distribute copies as required for Final Submittal and proceed with the work.
 3. If returned "Make Corrections Noted", Contractor shall distribute copies as required for Final Submittal and proceed with the work based upon the noted corrections or comments.
 4. If returned "Revise and Resubmit", Contractor shall have the submittal corrected according to the marks and comments and then resubmit in the same manner as the initial submittal, following Contractor's review. Add "(R-1)" to the submittal identification number for the first resubmittal, "(R-2)" for the second resubmittal, etc.
 5. If returned "Rejected", Contractor shall resubmit after making adjustments or changes, responding to the reason for the rejection.
- E. Final Submittal:
1. Final Submittal will be returned "No Exceptions Taken" or "Make Corrections Noted". Contractor may proceed with the work (based on noted corrections or comments, if provided) and distribute prints of the reproducibles submittal as follows:

SUBMITTAL PROCEDURES

- g. Distribute one set of prints to each entity that will be affected by the submittal data or must coordinate with that submitting entity.
 - h. Retain one set of prints where required for each Operations and Maintenance Manual.
 - i. Retain one set of prints as a "Record Document".
 - j. Retain construction and record sets as required for Contractor's use.
 - k. Return the reproducible to the entity which prepared the submittal. Engineer will forward one copy to the County.
 - l. Do not use, or allow others to use, submittals marked "Contractor has Not Approved", "Revise and Resubmit", or "Rejected" at the Project Site or elsewhere where Work is in progress.
- F. Unsolicited Submittals: The Engineer will return unsolicited submittals to the sender without action.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 023210

CEMENT STABILIZED SAND

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Cement stabilized sand.

1.2 MEASUREMENT AND PAYMENT

- A. Unit Prices.

- 1. No separate payment will be made for work performed under this Section. Include cost of such work in Contract unit prices for items listed in bid form requiring cement stabilized sand.
- 2. Refer to Paragraph 3.4 for material credit.

1.3 REFERENCES

- A. ASTM C 33 - Standard Specification for Concrete Aggregates (Fine Aggregate).
- B. ASTM C 40 - Standard Test Method for Organic Impurities in Fine Aggregates for Concrete.
- C. ASTM C 42 - Standard Test Methods for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
- D. ASTM C 94 - Standard Specification for Ready-Mixed Concrete.
- E. ASTM C 123 - Standard Test Method for Lightweight Particles in Aggregate.
- F. ASTM C 142 - Standard Test Method for Clay Lumps and Friable Particles in Aggregates.
- G. ASTM C 150 - Specification for Portland Cement.
- H. ASTM D 558 - Standard Test Method for Moisture-Density Relations of Soil Cement-Mixtures.
- I. ASTM D 1632 - Standard Practice for Making and Curing Soil-Cement Compression and Flexure Test Specimens in the Laboratory
- J. ASTM D 1633 - Standard Test Method for Compressive Strength of Molded Soil-Cement Cylinders.

- K. ASTM D 2487 - Standard Test Method for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
- L. ASTM D2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
- M. ASTM D 3665 - Standard Practice for Random Sampling of Construction Materials.
- N. ASTM D 4318 - Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

1.4 SUBMITTALS

- A. Submittals shall conform to requirements of General Condition Section 3.1
- B. Submit proposed target cement content and production data for sand-cement mixture in accordance with requirements of Paragraph 2.3, Materials Qualifications.

1.5 DESIGN REQUIREMENTS

- A. Use sand-cement mixture producing minimum unconfined compressive strength of 100 pounds per square inch (psi) in 48 hours.
 - 1. Design will be based on strength specimens molded in accordance with ASTM D 558 at moisture content within 3 percent of optimum and within 4 hours of batching.
 - 2. Determine minimum cement content from production data and statistical history. Provide no less than 1.1 sacks of cement per ton of dry sand.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cement: Type I Portland cement conforming to ASTM C 150.
 - 1. Sand: Clean, durable sand meeting grading requirements for fine aggregates of ASTM C 33.
 - 2. Deleterious materials:
 - a. Clay lumps, ASTM C 142 - less than 0.5 percent.
 - b. Lightweight pieces, ASTM C 123; less than 5.0 percent.

- c. Organic impurities, ASTM C 40, color no darker than standard color.
- 3. Plasticity index of 4 or less when tested in accordance with ASTM D 4318.
- B. Water: Potable water, free of oils, acids, alkalies, organic matter or other deleterious substances, meeting requirements of ASTM C 94.

2.2 MIXING MATERIALS

- A. Add required amount of water and mix thoroughly in pugmill-type mixer.
- B. Stamp batch ticket at plant with time of loading. Reject material not placed and compacted within 4 hours after mixing.

2.3 MATERIAL QUALIFICATION

- A. Determine target cement content of material as follows:
 - 1. Obtain samples of sand-cement mixtures at production facility representing range of cement content consisting of at least three points.
 - 2. Complete molding of samples within 4 hours after addition of water.
 - 3. Perform strength tests (average of two specimens) at 48 hours and 7 days.
 - 4. Perform cement content tests on each sample.
 - 5. Perform moisture content tests on each sample.
 - 6. Plot average 48-hour strength vs. cement content.
 - 7. Record scale calibration date, sample date, sample time, molding time, cement feed dial settings, and silo pressure (if applicable).
- B. Test raw sand for following properties at point of entry into pug-mill:
 - 1. Gradation
 - 2. Plasticity index
 - 3. Organic impurities
 - 4. Clay lumps and friable particles
 - 5. Lightweight pieces

- 6. Moisture content
- 7. Classification
- C. Present data obtained in format similar to that provided in sample data form attached to this Section.
- D. The target content may be adjusted when statistical history so indicates. For determination of minimum product performance use formula:

$$f_c\% \text{ 1/2 standard deviation}$$

PART 3 - EXECUTION

3.1 PLACING

- A. Place sand-cement mixture in maximum 12-inch-thick loose lifts and compact to 95 percent of maximum density as determined in accordance with ASTM D 558, unless otherwise specified. Refer to related specifications for thickness of lifts in other applications. Target moisture content during compaction is ± 3 percent of optimum. Perform and complete compaction of sand-cement mixture within 4 hours after addition of water to mix at plant.
- B. Do not place or compact sand-cement mixture in standing or free water.

3.2 FIELD QUALITY CONTROL

- A. Testing will be performed under general conditions as per section 5 Inspecting and Testing.
- B. One sample of cement stabilized sand shall be obtained for each 150 tons of material placed per day with no less than one sample per day of production. Random samples of delivered cement stabilized sand shall be taken in the field at point of delivery in accordance with ASTM 3665. Obtain three individual samples of approximately 12 to 15 lb each from the first, middle, and last third of the truck and composite them into one sample for test purpose.
- C. Prepare and mold four specimens (for each sample obtained) in accordance with ASTM D 558, Method A, without adjusting moisture content. Samples will be molded at approximately same time material is being used, but no later than 4 hours after water is added to mix.
- D. After molding, specimens will be removed from molds and cured in accordance with ASTM D 1632.
- E. Specimens will be tested for compressive strength in accordance with ASTM D 1633, Method A. Two specimens will be tested at 48 hours plus or minus 2 hours and two specimens will be tested at 7 days plus or minus 4 hours.

- F. A strength test will be average of strengths of two specimens molded from same sample of material and tested at same age. Average daily strength will be average of strengths of all specimens molded during one day's production and tested at same age.
- G. Precision and Bias: Test results shall meet recommended guideline for precision in ASTM D 1633 Section 9.
- H. Reporting: Test reports shall contain, as a minimum, the following information:
 - 1. Supplier and plant number
 - 2. Time material was batched
 - 3. Time material was sampled
 - 4. Test age (exact hours)
 - 5. Average 48-hour strength
 - 6. Average 7-day strength
 - 7. Specification section number
 - 8. Indication of compliance / non-compliance
 - 9. Mixture identification
 - 10. Truck and ticket numbers
 - 11. The time of molding
 - 12. Moisture content at time of molding
 - 13. Required strength
 - 14. Test method designations
 - 15. Compressive strength data as required by ASTM D 1633
 - 16. Supplier mixture identification
 - 17. Specimen diameter and height, in.
 - 18. Specimen cross-sectional area, sq. in.

3.3 ACCEPTANCE

- A. Strength level of material will be considered satisfactory if:
 - 1. The average 48-hour strength is greater than 100 psi with no individual strength test below 70 psi.
 - 2. All 7-day individual strength tests (average of two specimens) are greater than or equal to 100 psi.
- B. Material will be considered deficient when 7-day individual strength test (average of two specimens) is less than 100 psi but greater than 70 psi. See Paragraph 3.4 Adjustment for Deficient Strength.
- C. The material will be considered unacceptable and subject to removal and replacement at Contractor's expense when individual strength test (average of two specimens) has 7-day strength less than 70 psi.

- D. When moving average of three daily 48-hour averages falls below 100 psi, discontinue shipment to project until plant is capable of producing material, which exceeds 100 psi at 48 hours. Five 48-hour strength tests shall be made in this determination with no individual strength tests less than 100 psi.
- E. Testing laboratory shall notify Contractor, County Engineer, and material supplier by facsimile of tests indicating results falling below specified strength requirements within 24 hours.
- F. If any strength test of laboratory cured specimens falls below the specified strength, Contractor may, at his own expense, request test of cores drilled from the area in question in accordance with ASTM C42. In such cases, three (3) cores shall be taken for each strength test that falls below the values given in 3.3.A.
- G. Cement stabilized sand in an area represented by core tests shall be considered satisfactory if the average of three (3) cores is equal to at least 100 psi and if no single core is less than 70 psi. Additional testing of cores extracted from locations represented by erratic core strength results will be permitted.

3.4 ADJUSTMENT FOR DEFICIENT STRENGTH

- A. When mixture produces 7-day compressive strength greater than or equal to 100 psi, then material will be considered satisfactory and bid price will be paid in full.
- B. When mixture produces 7-day compressive strength between 100 psi and 70 psi material may be accepted contingent on an agreement credit amount as approved by the County
- C. When mixture produces 7-day compressive strength less than 70 pounds per square inch, then remove and replace cement-sand mixture and paving and other necessary work at no cost to the County.

END OF SECTION

SECTION 025050

HIGH DENSITY POLYETHYLENE (HDPE) SOLID AND PROFILE WALL PIPE

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. High Density Polyethylene (HDPE) pipe for gravity sewers and drains, including fittings.
- B. HDPE pipe for sanitary sewer force mains, including fittings.

1.2 MEASUREMENT AND PAYMENT

- A. Unit Prices.
 - 1. No separate payment will be made for HDPE pipe under this Section. Include cost in unit prices for work, as specified in the following sections:
 - a. Section 026310 – Storm Sewers

1.3 REFERENCES

- A. ASTM D 618 - Practice for Conditioning Plastics and Electrical Insulating Materials for Testing.
- B. ASTM D 1248 - Specification for Polyethylene Plastics Molding and Extrusion Materials.
- C. ASTM D 2657 - Standard Practice for Heat -Joining Polyolefin Pipe and Fittings.
- D. ASTM D 2837 – Standard test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials.
- E. ASTM D 3035 – Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled outside Diameter.
- F. ASTM D 3212 - Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.
- G. ASTM D 3350 - Specification for Polyethylene Plastic Pipe and Fittings Materials.
- H. ASTM F 477 - Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
- I. ASTM F 714 - Specification for Polyethylene Plastic (PE) Pipe (SDR-PR) Based on Outside Diameter.
- J. ASTM F 894 - Specification for Polyethylene Plastic (PE) Large-diameter Profile Wall Sewer and Drain Pipe.
- K. ASTM F 2487 – Standard Specification for 12 to 60 in. Annular Corrugated Profile-Wall Polyethylene (PE) Pipe and Fittings for Gravity Flow Storm Sewer and Subsurface Drainage Applications.
- L. ASTM F 2510 – Standard Specification for Resilient Connectors between Concrete Manhole Structures and Corrugated High Density Polyethylene Drainage Pipes.

1.4 SUBMITTALS

- A. Submit shop drawings showing design of pipe and fittings indicating alignment and grade, laying dimensions, fabrication, fittings, flanges, and special details.

1.5 QUALITY CONTROL

- A. Provide the manufacturer's certificate of conformance to the Specifications.
- B. Furnish pipe and fittings that are homogeneous throughout and free from visible cracks, holes, foreign inclusions or other injurious defects. Provide pipe as uniform as commercially practical in color, opacity, density and other physical properties.

PART 2 - PRODUCTS

2.1 APPROVED AND PREAPPROVED PRODUCTS

- A. Provide HDPE pipe as follows:

WALL CONSTRUCTION	MANUFACTURER	PRODUCT OPTIONS	ASTM DESIGNATION	PIPE STIFFNESS (MIN)	DIAMETER RANGE (INCHES)
Solid Wall	Drisco 1000 Drisco 8600 Quail Pipe Poly Pipe Plexco	Approved	F714	115 psi	8 to 10
				46 psi	12 to 48
Profile Wall	Spirolite	Pre-approved	F894	46 psi	18 to 120

- B. Solid wall pipe shall be produced with plain end construction for heat-joining (butt fusion) conforming to ASTM D 2657. Utilize controlled temperatures and pressures for joining to produce a fused leak-free joint.
- C. Furnish profile-wall gravity sewer pipe with bell-and-spigot end construction conforming to ASTM D 3212. Joining will be accomplished with an elastomeric gasket in accordance with the manufacturer's recommendations. Use integral bell-and-spigot gasketed joint designed so that when assembled, the elastomeric gasket, contained in a machined groove on the pipe spigot, is compressed radially in the pipe bell to form a positive seal. Also have joint designed to avoid displacement of the gasket when installed in accordance with the manufacturer's recommendations.
- C. Furnish corrugated profile –wall polyethylene (CPP) pipe for gravity storm sewer and storm sewer culvert pipe. Joints shall be installed such that connection of pipe sections will form continuous line free from irregularities in flow line. Suitable Joints are:
 1. Integral Bell and Spigot. Bell shall overlap minimum of two corrugations of spigot end when fully engaged.
 2. Exterior Bell and Spigot. Bell shall be fully welded to exterior of pipe and overlap spigot end so that flow lines and ends match when fully engaged.

2.2 MATERIALS

- A. Pipe and Fittings: High density, high molecular weight polyethylene pipe material meeting the requirements of Type III, Class C, Category 5, Grade P34, as defined in ASTM D 1248. Material meeting the requirements of cell classification in accordance with ASTM D 3350 are also suitable for making pipe products under these specifications.
- B. Other Pipe Materials: Materials other than those specified in Paragraph 2.02A, Pipe and Fittings, may be used as part of the profile construction, e.g., as a core tube to support the shape of the profile during processing, provided that these materials are compatible with the base polyethylene material and are completely encapsulated in the finished product and in no way compromise the performance of the pipe products in the intended use. Examples of suitable material include polyethylene and polypropylene.
- C. Gaskets.
 - 1. Use gaskets meeting requirement of ASTM F 477. Use gasket molded into a circular form or extruded to the proper section and then spliced into circular form. When no contaminant is identified, use gaskets of a properly cured, high-grade elastomeric compound. The basic polymer shall be natural rubber, synthetic elastomer, or a blend of both.
 - 2. Pipes to be installed in potentially contaminated areas, especially where free product is found near the elevation of the proposed sewer, shall have the following gasket materials for the noted contaminants:

CONTAMINANT	GASKET MATERIAL REQUIRED
Petroleum (diesel, gasoline)	Nitrile Rubber
Other Contaminants	As recommended by the pipe manufacturer

- D. Lubricant. Use a lubricant for assembly of gasketed joints which has no detrimental effect on the gasket or on the pipe, in accordance with manufacturer's recommendations.

2.3 WORKMANSHIP

- A. Furnish pipe and fittings that are homogeneous throughout and free from visible cracks, holes, foreign inclusions, or other injurious defects. Provide pipe as uniform as commercially practical in color, opacity, density, and other physical properties.

2.4 INSPECTIONS

- A. The County reserves the right to inspect pipes or witness pipe manufacturing. Such inspection shall in no way relieve the manufacturer of the responsibilities to provide products that comply with the applicable standards and these Specifications.
- B. Manufacturer's Notification: Should the County wish to witness the manufacture of specific pipes, the manufacturer shall provide the County with adequate advance notice of when and where the production of those specific pipes will take place.
- C. Failure to Inspect. Approval of the products or tests is not implied by the County's decision not to inspect the manufacturing, testing, or finished pipes.

2.5 TEST METHODS

- A. Conditioning. Conditioning of samples prior to and during tests are subject to approval by County. When referee tests are required, condition the specimens in accordance with Procedure A in ASTM D 618 at 73.4 degrees F plus or minus 3.6 degrees F and 50 percent relative humidity plus or minus 5 percent relative humidity for not less than 40 hours prior to test. Conduct tests under the same conditions of temperature and humidity unless otherwise specified.
- B. Flattening. Flatten three specimens of pipe, prepared in accordance with Paragraph 2.05A, in a suitable press until the internal diameter has been reduced to 40 percent of the original inside diameter of the pipe. The rate of loading shall be uniform and at 2-inches per minute. The test specimens, when examined under normal light and with the unaided eye, shall show no evidence of splitting, cracking, breaking, or separation of the pipe walls or bracing profiles.
- C. Joint Tightness. Test for joint tightness in accordance with ASTM D 3212, except replace the shear load transfer bars and supports with 6-inch-wide support blocks that can be either flat or contoured to conform to the pipe's outer contour.
- D. Purpose of Tests. The flattening and the joint tightness tests are not intended to be routine quality control tests, but rather to qualify pipe to a specified level of performance.

2.6 MARKING

- A. Mark each standard and random length of pipe in compliance with these Specifications with the following information:
 - 1. Pipe size
 - 2. Pipe class
 - 3. Production code
 - 4. Material designation

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Conform to requirements of the following Sections:
 - 1. Section 026310 – Storm Sewer.
- B. Install pipe in accordance with the manufacturer's recommended installation procedures.

END OF SECTION

SECTION 026310

STORM SEWERS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. New storm sewers and appurtenances, modifications to existing storm sewer system, installation of roadside ditch culverts, and removal and replacement of encroachments.

1.2 MEASUREMENT AND PAYMENT

- A. Unit Prices.
 - 1. Payment for storm sewers, installed by open-cut is on linear foot basis. Measurement for storm sewers and roadside ditch culverts will be taken along center line of pipe from end to end of inlets or from end to end of culverts. Payment will be made for each linear foot installed complete in place, including connections to existing inlets.
 - 2. Removal and replacement of encroachments will not be measured separately, but are incidental to the pipe installation.

1.3 SUBMITTALS

- A. Submittals shall conform to requirements of Section 013300 – Submittal Procedures.
- B. Submit manufacturer's literature for product specifications and installation instructions.
- C. Submit proposed methods, equipment, materials, and sequence of operations for sewer construction. Plan operations to minimize disruption of utilities to occupied facilities or adjacent property.

1.4 QUALITY ASSURANCE

- A. The Condition for acceptance shall be watertight storm sewer that is watertight both in pipe-to-pipe joints.
- B. Provide manufacturer's certification to Specifications.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Comply with manufacturer's recommendations.
- B. Handle pipe, fittings, and accessories carefully with approved handling devices. Do not drop or roll pipe off trucks or trailers. Do not use Materials cracked, gouged, chipped, dented, or otherwise damaged shall not be use materials for installation.
- C. Store pipe and fittings on heavy timbers or platforms to avoid contact with ground.

- D. Unload pipe, fittings, and appurtenances as close as practical to location of installation to avoid unnecessary handling.
- E. Keep interiors of pipe and fittings free of dirt and foreign matter.

PART 2 - PRODUCTS

2.1 PIPE

- A. Provide piping materials for storm sewers shall be of sizes and types specified unless otherwise indicated on Drawings.
- B. In diameters where material alternatives are available, provide pipe from single manufacturer for each pipe diameter, unless otherwise approved by County Engineer or otherwise shown on Drawings.
- C. Existing pipe that has been removed during construction cannot be reused.

2.2 PIPE MATERIAL SCHEDULE

- A. Storm Sewer Pipe: Use pipe materials that conforming to requirements specified in one or more of the following Sections as shown on the Drawings.
 - 1. Item 464 – Reinforced Concrete Pipe.
 - 2. Item 465 – Junction Boxes, Manholes, and Inlets.
- B. Driveway Culvert Pipe for Streets with Open Ditches: Use pipe materials conforming to requirements specified in one or more of the following Sections as shown on the Drawings.
 - 1. Item 464 – Reinforced Concrete Pipe.
 - 2. Item 465 – Junction Boxes, Manholes, and Inlets.
- C. Provide pipe meeting minimum class, dimension ratio, or other criteria indicated.
- D. Pipe materials other than those listed above shall not be used for storm sewers.

2.3 BEDDING, BACKFILL, AND TOPSOIL MATERIAL

- A. Bedding and Backfill Material: Conform to requirements of Item 400 – Excavation and Backfill for Structures, and Section 023210 – Cement Stabilized Sand.
- B. Topsoil: Conform to requirements of Item 160 – Topsoil.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prepare traffic control plans and set up street detours and barricades in preparation for excavation when construction will affect traffic.
- B. Provide barricades, flashing warning lights, and signs for excavations. Maintain barricades and warning lights for streets and intersections while Work is in progress or where traffic is affected by Work.
- C. Immediately notify agency or company owning utility lines which are damaged, broken, or disturbed. Obtain approval from County Engineer and agency for repairs or relocations, either temporary or permanent.
- D. Remove old pavements and structures, including sidewalks and driveways in accordance with requirements of Item 104 – Removing Concrete.
- E. Remove encroachments (walkway bridge, etc.) and replace after removal and replacement of pipe.

3.2 EXCAVATION

- A. Earthwork. Conform to requirements of Item 400 – Excavation and Backfill for Structures. Use bedding as indicated on Drawings.
- B. Line and Grade. Establish required uniform line and grade trench from benchmarks identified by County Engineer. Maintain this control for minimum of 100 feet behind and ahead of pipe-laying operation. Use laser beam equipment to establish and maintain proper line and grade of Work. Or use appropriately sized grade boards which are substantially supported.
- C. Trench Excavation. Excavate pipe trenches to level as indicated on Standard Details. Backfill excavation with specified bedding material to level of lower one-third of pipe barrel. Tamp and compact backfill to provide bedding at indicated grade. Form bedding foundation to minimum depth of one-eighth of pipe diameter, but not less than 12 inches.

3.3 PIPE INSTALLATION

- A. Install in accordance with pipe manufacturer's recommendations and as specified in this section.
- B. Install pipe only after excavation is completed, bottom of trench is shaped, bedding material is installed, and trench has been approved by County Engineer.
- C. Install pipe to line and grade indicated on Drawings. Place pipe so that it has continuous bearing of barrel on bedding material with no voids, and is laid in trench so interior surfaces of pipe follow grades and alignments indicated.

- D. Install pipe with bells of pipe facing upstream of anticipated flow.
- E. Form concentric joint with each section of adjoining pipe to prevent offsets.
- F. Place and drive home newly laid sections with a sling or come-a-long winches to eliminate damage to sections. Unless otherwise approved by County Engineer, provide end protection to prevent damage while using back hoes or similar powered equipment to drive home newly laid sections.
- G. Keep interior of pipe clean as installation progresses.
- H. Keep excavations free of water during construction and until final inspection.
- I. When work is not in progress, cover exposed ends of pipes with pipe plug specifically designed to prevent foreign material from entering pipe.

3.6. BACKFILL AND SITE CLEANUP

- A. Backfill trench after pipe installation is inspected and approved by County Engineer.
- B. Backfill and compact soil in accordance with Item 400 – Excavation and Backfill for Structures.
- C. Repair and replace removed or damaged pavement and sidewalks.
- D. In unpaved areas, grade surface as uniform slope to natural grade as indicated on Drawings. Provide minimum of 4 inches of topsoil and seed according to requirements of Item 162 – Sodding for Erosion Control, as required.

END OF SECTION

SECTION 027260

CCFRPM PIPE FOR SLIPLINING INSTALLATION

PART 1 - GENERAL

1.1. SECTION INCLUDES

- A. Requirements for Centrifugally Cast Fiberglass Reinforced Polymer Mortar Pipe. (CCFRPM)

1.2 MEASUREMENT AND PAYMENT

- A. Measurement and payment is as noted on the Unit Price Schedule.
- B. Refer to Item 9 – Measurement and Payment for unit price procedures.

1.3 REFERENCES

- A. ASTM D3262 - Standard Specification for “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer Pipe.
- B. ASTM D4161 - Standard Specification for “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe Joints Using Flexible Elastomeric Seals.
- C. ASTM D2412 - Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading.
- D. ASTM D3681 – Standard Test Method for Chemical Resistance of “Fiber glass” Pipe in a Deflected Condition.
- E. ASTM D638 – Test Method for Tensile Properties of Plastics.

1.4 SPECIFICATIONS

- A. The specifications contained herein govern, unless otherwise agreed upon between purchaser and supplier.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Resin Systems: The manufacturer shall use only polyester resin systems with a proven history of performance in this particular application. The historical data shall have been acquired from a composite material of similar construction and composition as the proposed product.
- B. Glass Reinforcements: The reinforcing glass fibers used to manufacture the components shall be of highest quality commercial grade E-glass filaments with binder and sizing compatible with impregnating resins.
- C. Silica Sand: Sand shall be minimum 98% silica with a maximum moisture content of 0.2%.

- D. Additives: Resin additives, such as curing agents, pigments, dyes, fillers, thixotropic agents, etc., when used, shall not detrimentally affect the performance of the product.
- E. Elastomeric Gaskets: Gaskets shall meet ASTM F477 and be supplied by qualified gasket manufacturers and be suitable for the service intended.

2.2 MANUFACTURE AND CONSTRUCTION

- A. Pipes: Manufacture pipe by the centrifugal casting process to result in a dense, nonporous, corrosion-resistant, consistent composite structure. The interior surface of the pipes exposed to sewer flow shall be manufactured using a resin which shall provide crack resistance and abrasion resistance. The exterior surface of the pipes shall be comprised of a sand and resin layer which provides UV protection to the exterior. Pipes shall be Type 1, Liner 2, Grade 3 per ASTM D3262.
- B. Joints: Unless otherwise specified, the pipe shall be field connected with low profile, fiberglass bell-spigot joints or flush fiberglass bell-spigot joints, when the fit requires. Either joint shall utilize elastomeric sealing gaskets as the sole means to maintain joint water tightness and shall meet the performance requirements of ASTM D4161. Joints at tie-ins, when needed, may utilize gasket-sealed closure couplings.
- C. Fittings: Flanges, elbows, reducers, tees, wyes, laterals and other fittings shall be capable of withstanding all operating conditions when installed. They may be contact molded or manufactured from mitered sections of pipe joined by glass-fiber-reinforced overlays.
- D. Acceptable Manufacturer: HOBAS Pipe USA.

2.3 DIMENSIONS

- A. Diameters: The actual outside diameter (18" to 48") of the pipe barrel shall be in accordance with ASTM D3262. For other diameters, OD's shall be per manufacturer's literature.
- B. Lengths: Pipe shall be supplied in nominal lengths of 20 feet. When required by radius curves, pit size, sewer irregularities, etc., pipe shall be supplied in nominal lengths of 10 feet or other even divisions of 20 feet. Actual laying length shall be nominal +1, -4 inches. At least 90% of the total footage of each size and class of pipe, excluding special order lengths, shall be furnished in nominal length sections.
- C. Wall Thickness: The minimum wall thickness shall be the stated design thickness as shown on the drawings.
- D. End Squareness: Pipe ends shall be square to the pipe axis with a maximum tolerance of 1/8".

2.4 TESTING

- A. Pipes: Pipes shall be manufactured and tested in accordance with ASTM D3262.
- B. Joints: Joints shall meet the requirements of ASTM D4161.
- C. Stiffness: Minimum pipe stiffness when tested in accordance with ASTM D2412 shall normally be 36 psi.

- D. Strain Corrosion: The extrapolated 50-year strain corrosion value shall not be less than 0.9% as determined in accordance with ASTM D3681 and ASTM D3262.

2.5 INSPECTION

- A. The Owner or other designated representative shall be entitled to inspect pipes or witness the pipe manufacturing.
- B. Manufacturer's Notification to Customer: Should the Owner request to see specific pipes during any phase of the manufacturing process, the manufacturer must provide the Owner with adequate advance notice of when and where the production of those pipes will take place.

2.6 PACKAGING, HANDLING, AND SHIPPING

- A. Packaging, handling, and shipping shall be done in accordance with the manufacturer's instructions.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Installation: The installation of pipe and fittings shall be in accordance with the project plans and specs and the manufacturer's requirements (Section 14 B of product brochure).
- B. Pipe Grouting: Annular space grouting shall not damage the liner and shall conform to the manufacturer's requirements (Section 14 B of product brochure).
- C. Pipe Handling: Use textile slings, other suitable materials or a forklift. Use of chains or cables is not recommended.
- D. Jointing
 1. Clean ends of pipe and joint components.
 2. Apply joint lubricant to the bell interior surface and the elastomeric seals. Use only lubricants approved by the pipe manufacturer.
 3. Use suitable equipment and end protection to push or pull the pipes together.
 4. Do not exceed forces recommended by the manufacturer for joining or pushing pipe.
 5. Join pipes in straight alignment then deflect to the required angle. Do not allow the deflection angle to exceed the deflection permitted by the manufacturer.
- E. Field Tests
 1. Acceptance of the installed liner shall be based on a video taped TV inspection after grouting to assure all joints are properly assembled, no damage exists and that any leakage or deformation is within the allowable limits.

END OF SECTION

SECTION 027270

CCFRPM PIPE FOR DIRECT BURY INSTALLATION

Part I - GENERAL

1.1 SECTION INCLUDES

- A. Centrifugally Cast Fiberglass Reinforced Polymer Mortar Pipe. (CCFRPM)

1.2 MEASUREMENT AND PAYMENT

- A. Measurement and payment is as noted on the Unit Price Schedule.
- B. Refer to Section 01026 – Measurement and Payment for unit price procedures.

1.3 REFERENCES

- A. ASTM D3262 - Standard Specification for “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer Pipe.
- B. ASTM D4161 - Standard Specification for “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe Joints Using Flexible Elastomeric Seals.
- C. ASTM D2412 - Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading.
- D. ASTM D3681 – Standard Test Method for Chemical Resistance of “Fiber glass” Pipe in a Deflected Condition.
- E. ASTM D638 – Test Method for Tensile Properties of Plastics.

1.4 SPECIFICATIONS

- A. The specifications contained herein govern, unless otherwise agreed upon between purchaser and supplier.

Part 2 - PRODUCTS

2.1 MATERIALS

- A. Resin Systems: The manufacturer shall use only polyester resin systems with a proven history of performance in this particular application. The historical data shall have been acquired from a composite material of similar construction and composition as the proposed product.
- B. Glass Reinforcements: The reinforcing glass fibers used to manufacture the components shall be of highest quality commercial grade E-glass filaments with binder and sizing compatible with impregnating resins.
- C. Silica Sand: Sand shall be minimum 98% silica with a maximum moisture content of 0.2%.
- D. Additives: Resin additives, such as curing agents, pigments, dyes, fillers, thixotropic agents, etc., when used, shall not detrimentally effect the performance of the product.

- E. Elastomeric Gaskets: Gaskets shall meet ASTM F477 and be supplied by qualified gasket manufacturers and be suitable for the service intended.

2.2 MANUFACTURER AND CONSTRUCTION

- A. Pipes: Manufacture pipe by the centrifugal casting process to result in a dense, nonporous, corrosion-resistant, consistent composite structure. The interior surface of the pipes exposed to sewer flow shall be manufactured using a resin with a 50% elongation (minimum) when tested in accordance with D638. The interior surface shall provide crack resistance and abrasion resistance. The exterior surface of the pipes shall be comprised of a sand and resin layer which provides UV protection to the exterior.
- B. Joints: Unless otherwise specified, the pipe shall be field connected with fiberglass sleeve couplings that utilize elastomeric sealing gaskets as the sole means to maintain joint watertightness. The joints must meet the performance requirements of ASTM D4161. Joints at tie-ins, when needed, may utilize gasketsealed closure couplings.
- C. Fittings: Flanges, elbows, reducers, tees, wyes, laterals and other fittings shall be capable of withstanding all operating conditions when installed. They may be contact molded or manufactured from mitered sections of pipe joined by glass-fiber-reinforced overlays. Properly protected standard ductile iron, fusionbonded epoxy-coated steel and stainless steel fittings may also be used.
- D. Acceptable Manufacturer: HOBAS Pipe USA.

2.3 DIMENSIONS

- A. Diameters: The actual outside diameter (18" to 48") of the pipes shall be in accordance with ASTM D3262. For other diameters, OD's shall be per manufacturer's literature.
- B. Lengths: Pipe shall be supplied in nominal lengths of 20 feet. Actual laying length shall be nominal +1, -4 inches. At least 90% of the total footage of each size and class of pipe, excluding special order lengths, shall be furnished in nominal length sections.
- C. Wall Thickness: The minimum wall thickness shall be the stated design thickness as shown on the drawings.
- D. End Squareness: Pipe ends shall be square to the pipe axis with a maximum tolerance of 1/8".

2.4 Testing

- A. Pipes: Pipes shall be manufactured and tested in accordance with ASTM D3262.
- B. Joints: Coupling joints shall meet the requirements of ASTM D4161.
- C. Stiffness: Minimum pipe stiffness when tested in accordance with ASTM D2412 shall normally be 36 psi.
- D. Strain Corrosion: The extrapolated 50-year strain corrosion value shall not be less than 0.9% as determined in accordance with ASTM D3681 and ASTM D3262.

2.5 INSPECTION

- A. The Owner or other designated representative shall be entitled to inspect pipes or witness the pipe manufacturing.

- B. Manufacturer's Notification to Customer: Should the Owner request to see specific pipes during any phase of the manufacturing process, the manufacturer must provide the Owner with adequate advance notice of when and where the production of those pipes will take place.

2.6 PACKAGING, HANDLING, SHIPPING

- A. Packaging, handling, and shipping shall be done in accordance with the manufacturer's instructions.

Part 3 - EXECUTION

3.1 INSTALLATION

- A. Burial: The bedding and burial of pipe and fittings shall be in accordance with the project plans and specifications and the manufacturer's requirements (Section 14A of the product brochure).
- B. Pipe Handling: Use textile slings, other suitable materials or a forklift. Use of chains or cables is not recommended.
- C. Jointing:
 - 1. Clean ends of pipe and coupling components.
 - 2. Apply joint lubricant to pipe ends and elastomeric seals of coupling. Use only lubricants approved by the pipe manufacturer.
 - 3. Use suitable equipment and end protection to push or pull the pipes together.
 - 4. Do not exceed forces recommended by the manufacturer for coupling pipe.
 - 5. Join pipes in straight alignment then deflect to required angle. Do not allow the deflection angle to exceed the deflection permitted by the manufacturer.
- D. Field Tests:
 - 1. Infiltration / Exfiltration Test: Maximum allowable leakage shall be per local specification requirements.
 - 2. Low Pressure Air Test: Each reach may be tested with air pressure (max 5 psi). The system passes the test if the pressure drop due to leakage through the pipe or pipe joints is less than or equal to the specified amount over the prescribed time period.
 - 3. Individual Joint Testing: For pipes large enough to enter, individual joints may be pressure tested with a portable tester to 5 psi max. with air or water in lieu of line infiltration, exfiltration or air testing.
 - 4. Deflection: Maximum allowable long term deflection is normally 5% of the initial diameter.

END OF SECTION

SPECIAL PROVISION TO ITEM 1

"DEFINITION OF TERMS"

For this project, Item 1 of the Texas Standard Specifications is hereby amended with respect to the clauses cited below and no other clauses or requirements of this Item are waived or changed hereby:

THE TERM "DEPARTMENT," "STATE," "STATE HIGHWAY DEPARTMENT OF TEXAS", "TxDOT", "TEXAS DEPARTMENT OF TRANSPORTATION", "STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION," "STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION COMMISSION," "COMMISSION," AND "STATE HIGHWAY COMMISSION," SHALL, IN THE USE OF THE STANDARD SPECIFICATIONS FOR ALL WORK IN CONNECTION WITH THIS PROJECT, BE DEEMED TO MEAN GALVESTON COUNTY, PARTY OF THE FIRST PART IN ACCOMPANYING CONTRACT OR CONTRACTS. ANY REFERENCE IN THE TEXAS STANDARD SPECIFICATIONS TO THE STATE OF TEXAS, ITS OFFICIALS, EMPLOYEES, OR AGENTS SHALL BE DEEMED TO MEAN GALVESTON COUNTY, ITS OFFICIALS, EMPLOYEES, OR AGENTS.

Articles 1.26, "Certificate of Insurance" ; 1.28, "Commission", 1.47, "Department", 1.70 "Letting Official " and 1.124 "State" are deleted.

Article 1.53, "ENGINEER", is revised to read in its entirety as follows:

1.53 ENGINEER. Galveston County Engineer or his authorized representatives. If a representative is authorized to function as the ENGINEER'S representative with respect to certain ENGINEER'S activities that representative's responsibilities and obligations shall be limited as provided in Article 1.148.

Article 1.64, "INSPECTOR," is revised to read in its entirety as follows:

1.64 INSPECTOR. The representative of the ENGINEER assigned and authorized to observe or inspect any or all parts of the work and the material to be used therein. A representative is authorized to function as the ENGINEER'S representative with respect to certain activities, and that representative's responsibilities and obligations shall be limited as provided in Article 1.148.

Special Provisions to Item 1

"DEFINITION OF TERMS"

ADDITIONAL ARTICLES ARE ADDED AS FOLLOWS:

1.148 CONSULTING ENGINEER. Independent engineering firms contracting with Galveston County for the providing of professional engineering services. The engineering firms are the representatives of Galveston County only to the extent provided in the Contract documents and in such special instances where they are specifically authorized by Galveston County so to act. All powers and rights assigned by Galveston County to the engineering firms with respect to the work are solely and exclusively for the benefit of Galveston County and not for the CONTRACTOR. In carrying out of its powers and rights assigned by Galveston County the engineering firms shall function as a representative of Galveston County and shall act by and for Galveston County. Irrespective of what authority may be assigned by Galveston County to the engineering firms, CONTRACTOR remains fully and solely responsible and liable for its obligations to perform the work in accordance with the requirements of the plans and specifications; to insure against failures in safety precautions; to carry out his work pursuant to safe methods of construction; to select and fulfill the proper manner, means, and methods in performing the work in order to meet the plans and specifications; and to complete the work in accordance with the contract documents.

SPECIAL PROVISION TO ITEM 2
INSTRUCTIONS TO BIDDERS

For this project, Item 2 of the Texas Standard Specifications is hereby deleted in its entirety.
The Instructions to Bidders is included elsewhere in the Contract Documents.

SPECIAL PROVISION TO ITEM 3
AWARD AND EXECUTION OF CONTRACT

For this project, Item 3 of the Texas Standard Specifications is hereby deleted in its entirety.
The Award and Execution of Contract is included elsewhere in the Contract Documents.

SPECIAL PROVISION TO ITEM 4

SCOPE OF WORK

For this project, Item 4 of the Texas Standard Specifications is hereby amended with respect to the clauses cited below and no other clauses or requirements of this Item are waived or changed hereby.

ARTICLE 4.2 "CHANGES IN WORK;" ARTICLE 4.3 "DIFFERING SITE CONDITIONS" and ARTICLE 4.4 "REQUESTS AND CLAIMS FOR ADDITIONAL COMPENSATION" are deleted in their entirety and replaced by Article 41 "CHANGES and ALTERATIONS" and ARTICLE 42 "EXTRA WORK" of "Special Provisions for Construction".

SPECIAL PROVISION TO ITEM 5

CONTROL OF THE WORK

For this project, Item 5 of the Texas Standard Specifications is hereby amended with respect to the clauses cited below and no other clauses or requirements of this Item are waived or changed hereby.

ARTICLE 5.2 "PLANS AND WORKING DRAWINGS." The first sentence of the first paragraph is hereby revised to read as follows:

When required, the Contractor shall provide working drawings to supplement the plans with all necessary details not included on the Contract plans.

ARTICLE 5.5 "COOPERATION OF CONTRACTOR." The last sentence of the first paragraph is hereby revised to read as follows:

The Contractor will be supplied with three (3) copies of the plans, specifications and special provisions and he shall have one (1) copy of each available on the project at all times.

ARTICLE 5.6 "CONSTRUCTION SURVEYING," is hereby deleted in its entirety.

ARTICLE 5.7 "INSPECTION." The sixth sentence of the second paragraph is hereby revised to read as follows:

If the uncovered work is acceptable, the costs to uncover, remove and replace or make good the parts removed will be paid for in accordance with Article 41. "Changes and Alterations" of "Special Provisions for Construction".

ARTICLE 5.8 "FINAL ACCEPTANCE," is hereby deleted in its entirety. It is replaced by Article 6(b). "PAYMENTS TO CONTRACTOR, FINAL PAYMENT" of "Special Provisions for Construction".

SPECIAL PROVISION TO ITEM 6

CONTROL OF MATERIALS

For this project, Item 6 of the Texas Standard Specifications is hereby amended with respect to the clauses cited below and no other clauses or requirements of this Item are waived or changed hereby.

ARTICLE 6.1 "SOURCE CONTROL." Paragraph A. "Buy America" and B. "Buy Texas" are hereby deleted in their entirety.

ARTICLE 6.7 "Department-furnished Material" is hereby deleted in it's entirety.

SPECIAL PROVISION TO ITEM 7

LEGAL RELATIONS AND RESPONSIBILITIES

For this project, Item 7 of the Texas Standard Specifications is hereby amended with respect to the clauses cited below and no other clauses or requirements of this Item are waived or changed hereby.

ARTICLE 7.4 "INSURANCE AND BONDS" is hereby deleted in its entirety.

ARTICLE 7.5 "RESTORING SURFACES OPENED BY PERMISSION." The third sentence of the first paragraph is hereby revised to read as follows:

Payment for repair of surfaces opened by permission will be made in accordance with Article 41. "Changes and Alterations" of "Special Provisions for Construction".

SPECIAL PROVISION TO ITEM 8

PROSECUTION AND PROGRESS

For this project, Item 8 of the Texas Standard Specifications is hereby amended with respect to the clauses cited below and no other clauses or requirements of this Item are waived or changed hereby.

ARTICLE 8.1 "PROSECUTION OF WORK" The third sentence in the first paragraph is hereby revised to read as follows:

"The Contractor shall begin the work to be performed under the contract within ten (10) days after the date of the authorization to begin work as shown on the work order.

ARTICLE 8.2 "PROGRESS SCHEDULES", B. "CONSTRUCTION CONTRACTS" The first sentence in the first paragraph is hereby revised to read as follows:

If required by the Engineer, before starting work on a construction Contract, prepare and submit a progress schedule based on the sequence of work and traffic control plan shown in the Contract.

SPECIAL PROVISION TO ITEM 9

MEASUREMENT AND PAYMENT

For this project, Item 9 of the Texas Standard Specifications is hereby amended with respect to the clauses cited below and no other clauses or requirements of this Item are waived or changed hereby.

ARTICLE 9.2 "PLANS QUANTITY MEASUREMENT" is hereby revised to read as follows: Plans quantities may not represent the exact quantity of work performed or material moved, handled, or placed during the execution of the Contract. The estimated bid quantities are designated as final payment quantities.

ARTICLE 9.4 "PAYMENT FOR EXTRA WORK" is hereby revised to read as follows:

Extra work ordered, performed and accepted will be paid for in accordance with ARTICLE 42, "EXTRA WORK" of "Special Provisions for Construction".

ARTICLE 9.5 "FORCE ACCOUNT" is hereby deleted in its entirety.

ARTICLE 9.6 "PROGRESS PAYMENTS" is hereby deleted in its entirety and replaced by ARTICLE 36, "PROGRESS PAYMENTS AND RETAINAGE" of Section IV, "General Terms and Conditions".

ARTICLE 9.8 "FINAL PAYMENT" and ARTICLE 40, "FINAL PAYMENT" are hereby deleted in their entirety and replaced by ARTICLE 6(b), "PAYMENTS TO CONTACTOR, FINAL PAYMENT" of "Special Provisions for Construction".

SPECIAL PROVISION

ITEM 502 – BARRICADES, SIGNS, AND TRAFFIC HANDLING

Delete paragraph 3.

Add the following paragraph:

3. MEASUREMENT

Barricades, Signs, and Traffic Handling will be measured by lump sum.

Delete paragraphs 4.1.1 and 4.1.2.

END OF SPECIAL PROVISION