BALTIMORE COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
DIVISION OF CONSTRUCTION CONTRACTS ADMINISTRATION
111 WEST CHESAPEAKE AVENUE
TOWSON, MARYLAND 21204

Contract No. 19007 SX0
Patapsco Sewershed Task D Structural Rehabilitation
Job Order No. 231-201-0077-7207
Workday No. 010777207
Catonsville, Arbutus, Lansdowne, & Security – District 1c1, 13c1

ADDENDUM NO. 2

DATE: 5/6/2025

Contact: Barb Wentworth, 410-887-3531, bwentworth@baltimorecountymd.gov

To All Bidders

This addendum is hereby made a part of the Proposal and the Special Provisions, and is hereby incorporated into the Contract. Should this addendum conflict with any portion of the Special Provisions, the Proposal, or any prior addenda, this addendum shall supersede and control.

Please note the attached changes, corrections, and/or information in connection with the contract and submit bids and be otherwise governed accordingly.

For Your Information

Attached are questions and answers received from contractors along with a revised list of attendees from the Pre-Bid meeting that was held on Wednesday, April 23, 2025 @ 10:00 A.M. EST. via WebEx.

In the Specifications

Revised and attached to be inserted:

- ***Remove*** Old Pages 20 through 36, Section SP-01025 – Measurement and Payment and ***Replace*** with Revised Pages 20 through 36, Section SP-01025 – Measurement and Payment.
- ***Add*** New Pages 160 A through 160 O, Section 2733 – Pipe Rehabilitation by Pulled-In-Place Glass Reinforced Plastic (GRP) CIPP Method (Per ASTM F2019).

In the Proposal

Revised and attached to be inserted: On the Description of Items & Schedule of Prices

- Page 770, **DELETE** Item #2 entirely.
- Page 771, Item 28, Air Test and Chemically Grout Service House Connections and First Joint Sections, ***change*** Unit of Measure ***to*** Gallon (GAL) ***from*** Each (EA) and the Estimated Quantity ***to*** 1850 ***from*** 306.
- Page 771, **DELETE** Item #30, Item #31 entirely.
- Page 772, **DELETE** Item #32 and Item #33 entirely.

In the Drawings

On Drawing 2017-0696: ***DELETE*** the last two sentences from Note 3 of the Sewer House Connection Rehabilitation Notes: “All SHCS shall be Air Tested per the contract documents. Any SHCS that fail the Air Testing, per the Rehabilitation Specification Section 2738 shall be grouted to prevent infiltration.”

Attachments – 34

Please sign below acknowledging receipt of this addendum and return with your bid.

_____ _____

Company Name **Signature**

Q1. Can alternative liner, UV Cured Glass Reinforced Pipe (GRP)/ASTM F2019, be used as a substitute lining system for the above solicitation?

If UV Cured Glass Reinforced Pipe (GRP)/ASTM 2019 can be used, what is the required structural wall thickness designed need to be.

A1. Glass reinforced plastic (GRP) CIPP can be used on the project. In addition to Section 2731 – Pipe Rehabilitation – General Requirements, submittals, materials, and construction shall be in accordance with Section 2733 - Pipe Rehabilitation By Pulled-In-Place Glass Reinforced Plastic (GRP) CIPP Method (Per ASTM F2019).

Design thickness is to be calculated as described in Section 2733.

Specifications

Add: Section 2733 PIPE REHABILITATION BY PULLED-IN-PLACE GLASS REINFORCED PLASTIC (GRP) CIPP METHOD (PER ASTM F2019)

Revise: Section SP-1025 by replacing Bid Items 9 thru 21:
ITEM 9 - CURED-IN PLACE PIPE LINING, 8 INCH
ITEM 10 - CURED-IN PLACE PIPE LINING, 10 INCH
ITEM 11 - CURED-IN PLACE PIPE LINING, 12 INCH
ITEM 12 - CURED-IN PLACE PIPE LINING, 15 INCH
ITEM 13 - CURED-IN PLACE PIPE LINING, 16 INCH
ITEM 14 - CURED-IN PLACE PIPE LINING, 18 INCH
ITEM 15 - CURED-IN PLACE PIPE LINING, 20 INCH
ITEM 16 - CURED-IN PLACE PIPE LINING, 21 INCH
ITEM 17 - CURED-IN PLACE PIPE LINING, 22 INCH
ITEM 18 - CURED-IN PLACE PIPE LINING, 24 INCH
ITEM 19 - CURED-IN PLACE PIPE LINING, 27 INCH
ITEM 20 - CURED-IN PLACE PIPE LINING, 30 INCH
ITEM 21 - CURED-IN PLACE PIPE LINING, 33 INCH

1. This item of work shall consist of all labor, materials and equipment required to complete the installation of cured in place pipe lining from manhole to manhole in mainline sewers as shown on the CONTRACT DRAWINGS, in accordance with Section 2732 and/or 2733 of the REHABILITATION SPECIFICATIONS and as directed by the Engineer.

2. Measurement and payment per actual linear foot of liner under this item will be made in accordance with Section 2732.04.01 and/or 2733.04.01 of the REHABILITATION SPECIFICATIONS.

3. Any modifications to the manhole openings for installation of the liners is to be considered incidental and included in the CIPP cost.

4. A combination of lining materials can be used throughout the project at the price bid per LF.

Q2. Can you confirm it is at the contractor's discretion to install access roads as needed? Will all required roads be paid under the respective pay item by SY?

A2. Per the details on ES-45, timber mats are for wetlands and wetland buffers. These locations have been shown on the drawings. These are part of erosion and sediment control and are considered incidental.

Mulch access paths are discretionary when crossing sensitive areas like private property. They have not been shown on the drawings. The 500 SY is intended to pay for mulch access roads, if they are required. As stated in SP-01025 Paragraph 1.03, the quantity is for bidding purposes actual quantities will vary.

Q3. What type of access roads shall be included in the pay item? The plans show details for both mulch roads and timber mat roads, these will have very different cost structures. Will the owner consider having separate pay items for each type of road?

A3. See the response to Q2.

Q4. Is it at the contractor's discretion which access road shall be used? If not can you clarify which road should be used in which locations?

A4. See the response to Q2.

Q5. Can you clarify how the bid quantity of 500 SY for access roads was determined? That seems very light based on the amount of easement/clearing work shown on the plans.

A4. See the response to Q2.

Q6. There are various plan sheets with rehabilitation called out, but then crossed out and marked as completed by others. Can you confirm that these sections are not apart of the scope of this contract? Can you confirm whether these quantities are included in the total bid quantities on the bid form? If so can this be revised?

A6. Confirmed. The crossed out items are not included in the quantities on the bid form.

Q7. What will be the determination for how the contingent lateral grouting item will be used? Will the owner review CCTV and select laterals based on this review?

A7. Laterals should be visually inspected and evaluated for repair if roots, infiltration, cracks, etc. are present during the pre-CCTV. Contractor shall identify these locations, and discuss repair options (grouting, replacement, or lining) with the County's inspector for approval. Locations of grouting have not been shown on the drawings. The quantity for grouting is estimated based on the observations made during designs.

Air testing of every SHC is not required. Air testing is only required if and after grouting is implemented.

Please note that taps must be fulling inspected by providing a full 360 degree view. Taps are to be free of roots and debris for acceptance. Please review the specifications carefully, especially Sections 2741 and 2742 for this matter.

Drawings

Drawing 2017-0696:

Delete the last two sentences from Note 3 of the SEWER HOUSE CONNECTION REHABILITATION NOTES: "ALL SHCS SHALL BE AIR TESTED PER THE CONTRACT DOCUMENTS. ANY SHCS THAT FAIL THE AIR TESTING, PER THE REHABILITATION SPECIFICATION SECTION 2738 SHALL BE GROUTED TO PREVENT INFILTRATION."

Specifications

Revise: Section SP-1025, page 26, Bid Item 28, such that the unit of measurement is changed from EACH to GALLONS:

ITEM 28 - AIR TEST AND CHEMICALLY GROUT SERVICE CONNECTIONS AND FIRST JOINT SECTIONS

1. This item of work shall consist of all labor, materials and equipment required to complete the chemical grouting of service connections and first joint sections and air testing of such repairs as directed, in accordance with Section 2738 of the of the REHABILITATION SPECIFICATIONS and as directed by the Engineer.

2. Measurement and payment shall be made bid per gallon of grout pumped for each service connection, including the first joint section, under this item and will be made in accordance with Section 2738.04.03 of the REHABILITATION SPECIFICATIONS.

3. Locations to be evaluated and determined at the time of pre-CCTV. Additional work maybe identified and required post liner installation.

Bid Form

Revise: Page 771, Bid Item 28, such that the unit of measurement is changed from EACH to GALLONS and the quantity is changed from 306 to 1850 gallons.

Q8. Can you confirm the total amount of Construction Entrances on this project? The bid quantity shows 4 and the E&S plans show a much higher quantity than that. Please clarify.

A8. Per Section SP-1025, Section 1.04 erosion and sediment control device will not be paid for separately. It is intended that they are to be included in the price bid for rehabilitation items. Bid Items will be revised.

Q9. Are all temporary bridges shown on the plans required to be installed? Shall all of these be prefabricated bridges per the detail in the plans?

A9. Temporary bridges are required across stream crossings to avoid waterway impacts. Bridges as shown on the drawings. Permitting was issued based on the plans provided. Temporary bridge details and construction specifications are provided on ES-45.

Q10. Will access roads need to be installed for all locations showing an LOD in an easement? Will all access roads be paid for under the pay item?

A10. See the response to Q2.

Q11. Will you consider postponing the bid date until there is more clarity given in regards to the easement/access work? This is a large and challenging portion of the project and it is currently unclear how to proceed with this work until more information is given.

A11. *At the discretion of the County.*

Specifications

Replace Section SP – 1025 Measurement and Payment

Replace the Bid Form.

The following items will be **Deleted** entirely.

- Item 2 - Clearing and Grubbing
- Item 30 – Mountable Berm
- Item 31 – Stabilized Construction Entrance
- Item 32 – Temporary Access Bridge
- Item 33 – Sand Bag Diversion

ATTENDANCE SHEET PLEASE PRINT REVISED

Project Name: Patapsco Sewershed Task D Structural Rehabilitation
Contract Number: 19007 SX0
Work Day Number: 010777207
Job Order Number: 231-201-0077-7207
Date Held: Wednesday, April 23, 2025 at 10:00 a.m. EST

Present	Name	Representing	Phone #	Email Address
√	Matt Leone	BC-DPWT-DCCA	410-887-3531	mleone@baltimorecountymd.gov
√	Kenny Green	BC-DPWT-DCCA	410-887-3531	krgreen@baltimorecountymd.gov
√	Andre Bivins	BC-DPWT-DCCA	410-887-3531	abivins@baltimorecountymd.gov
√	Timothy Byrd	BC-DPWT-DCCA	410-887-3531	tbyrd1@baltimorecountymd.gov
√	Barb Wentworth	BC-DPWT-DCCA	410-887-3531	bwentworth@baltimorecountymd.gov
√	Dave Bayer	BC-DPWT-Sewer Design Section	410-887-3781	dbayer@baltimorecountymd.gov
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SECTION SP-01025

MEASUREMENT AND PAYMENT

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SECTION SP-01025

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

Measurement and payment shall be according to the provisions of the STANDARD SPECIFICATIONS and STANDARD REHABILITATION SPECIFICATIONS, except as modified herein.

1.02 DESCRIPTION

A. Payment for the work completed under this Contract will be made at the lump sum and unit prices. These prices shall include the furnishing of all labor, tools, equipment and materials, and the performing of all work necessary to complete the project as shown and specified, in strict accordance with all the requirements of the CONTRACT DOCUMENTS and to the entire satisfaction of the Engineer.

B. When the term "as directed by the Engineer" is used in describing the method of measurement or basis of payment for an item of the Contract, it shall be understood that the order from the Engineer to the Contractor will be either: 1) a written direction, or 2) a verbal directive to be followed by written confirmation of it from both the Contractor to the Engineer and from the Engineer to the Contractor to minimize the possibility of a misunderstanding between the two.

1.03 CONTINGENT ITEMS

A. Contingent Items and quantities are established for the purpose of obtaining bids on one or more pay items that may be incorporated into the project. The Engineer shall have sole discretion in determining whether and to what extent such items will be incorporated into the project. The Engineer may order incorporation of such items at any location within the Contract and at any time during the work. These items may not be located on the Plans. The estimated quantities set out in the Invitation for Bids for such items are presented solely for the purpose of obtaining a representative bid price. The actual quantities employed may be only a fraction of, or many times the estimated quantity. Neither party shall make claims for additional compensation because of any increase, decrease or elimination of such items.

B. The Contractor in submitting the Proposal agrees to accept as full compensation the unit prices stipulated for the fixed price contingent items that are incorporated into the work as indicated. The fixed price contingent items shall be in accordance with Section 109, as amended by these SPECIAL PROVISIONS, of the STANDARD SPECIFICATIONS.

1.04 PAYMENT ITEMS

All labor, materials and equipment required for maintenance of traffic, on County and State roads; clearing and grubbing; forest, stream, and wetland protection; erosion and sediment control; and all site restoration, temporary and permanent, required to complete the work as shown on CONTRACTS DRAWINGS or as directed by the Engineer will be included in the prices bid for items in the proposal as defined in the specifications.

ITEM 1 - MOBILIZATION

1. This item of work consists of providing all material, labor, and equipment necessary to complete the mobilizing of all necessary equipment and supplies in accordance with Section 108 of the STANDARD SPECIFICATIONS and as directed by the Engineer.

2. Measurement and payment shall be paid per lump sum of the Contract bid price in accordance with Section 108.04 of the STANDARD SPECIFICATIONS.

~~ITEM 2 - CLEARING AND GRUBBING~~ **DELETED**

~~1. This item of work consists of providing all material, labor, and equipment necessary to complete the clearing and grubbing of all necessary vegetation in accordance with Section 101 of the STANDARD SPECIFICATIONS and as directed by the Engineer.~~

~~2. Work performed under this item will not be measured for payment but will be paid for at the Contract lump sum price in accordance with Section 101.04 of the STANDARD SPECIFICATIONS.~~

ITEM 3 - EXCAVATED POINT REPAIRS, 8-INCH
ITEM 4 - EXCAVATED POINT REPAIRS, 10-INCH
ITEM 5 - EXCAVATED POINT REPAIRS, 18-INCH

1. This item of work shall consist of all labor, materials and equipment required to complete excavated point repairs in the sewer mainline as shown on the CONTRACT DRAWINGS, in accordance with Plates G-6, G-6A, G-7, S-7 and R-38 of the STANDARD DETAILS,

Sections SP-01900, SP-02200, and SP-02600 of these SPECIAL PROVISIONS, Section 1007 of the Standard Specifications, Section 2744 of the REHABILITATION SPECIFICATIONS, and as directed by the Engineer.

2. Measurement and payment per actual linear foot of pipe installed for the repair of the sewer mainline as measured horizontally along the centerline of the trench for the length of the repair, including fittings, under this item will be made in accordance with Section 2744.04.01 of the REHABILITATION SPECIFICATIONS. Pricing shall include fittings to connect to the existing system (flexible couplings, fittings for manhole connections, etc.) and reconnection of drop connection at the manhole.

3. The amount of pipe to be replaced for each point repair shown on the CONTRACT DRAWINGS was estimated from CCTV inspection that may have been performed several years ago. Therefore, once the pipe is uncovered the Engineer may require the Contractor to replace more pipe than shown on the CONTRACT DRAWINGS.

ITEM 6 - REPLACEMENT OF HOUSE CONNECTION AND LATERAL TO REHABILITATED MAIN LINES

1. This item of work shall consist of all labor, materials and equipment required to complete sewer house connection excavated point repairs as shown on the CONTRACT DRAWINGS, in accordance with Plate R-38 of the STANDARD DETAILS, Sections SP-01900, SP-02200, and SP-02600 of these SPECIAL PROVISIONS, Section 1007 of the Standard Specifications, Section 2751 of the REHABILITATION SPECIFICATIONS, and as directed by the Engineer.

2. Measurement and payment per actual linear foot of pipe installed for the replacement of sewer house connections and laterals to rehabilitated main lines shall be based on the unit price per linear foot of lateral replaced, measured horizontally along the centerline of the trench from the wye (or tee) branch on the main sewer through the upstream replaced fittings and/or cap, including the fittings and/or cap, complete-in-place, under this item will be made in accordance with Section 2751.04.02 of the REHABILITATION SPECIFICATIONS.

ITEM 7 - SEWER HOUSE CONNECTION LATERAL SEALS (SHCLS)

1. This item of work shall consist of all labor, materials and equipment required to complete the installation of sewer house connection lateral seals in accordance with Section 2752 of the STANDARD

REHABILITATION SPECIFICATIONS and as directed by the Engineer.

2. Measurement and payment per each lateral seal installed complete in place under this item will be made in accordance with Section 2752.06.01 of the REHABILITATION SPECIFICATIONS, except as modified herein.

ITEM 8 - REMOVAL OF PROTRUDING SERVICE CONNECTIONS

1. This item of work shall consist of all labor, materials and equipment required to complete the removal of protruding sewer connections more than ½-inch into the main pipeline as shown on the CONTRACT DRAWINGS, in accordance with Section 2731 of the REHABILITATION SPECIFICATIONS, and as directed by the Engineer.

2. Measurement and payment per each intruding connection removed under this item will be made in accordance with Section 2731.04.01 of the REHABILITATION SPECIFICATIONS.

ITEM 9 - CURED-IN-PLACE PIPE LINING, 8-INCH
ITEM 10 - CURED-IN-PLACE PIPE LINING, 10-INCH
ITEM 11 - CURED-IN-PLACE PIPE LINING, 12-INCH
ITEM 12 - CURED-IN-PLACE PIPE LINING, 15-INCH
ITEM 13 - CURED-IN-PLACE PIPE LINING, 16-INCH
ITEM 14 - CURED-IN-PLACE PIPE LINING, 18-INCH
ITEM 15 - CURED-IN-PLACE PIPE LINING, 20-INCH
ITEM 16 - CURED-IN-PLACE PIPE LINING, 21-INCH
ITEM 17 - CURED-IN-PLACE PIPE LINING, 22-INCH
ITEM 18 - CURED-IN-PLACE PIPE LINING, 24-INCH
ITEM 19 - CURED-IN-PLACE PIPE LINING, 27-INCH
ITEM 20 - CURED-IN-PLACE PIPE LINING, 30-INCH
ITEM 21 - CURED-IN-PLACE PIPE LINING, 33-INCH

1. This item of work shall consist of all labor, materials and equipment required to complete the installation of cured-in-place pipe lining from manhole to manhole in mainline sewers as shown on the CONTRACT DRAWINGS, in accordance with Section 2732 and/or 2733 of the REHABILITATION SPECIFICATIONS and as directed by the Engineer.

2. Measurement and payment per actual linear foot of liner under this item will be made in accordance with Section 2732.04.01 and/or 2733.04.01 of the REHABILITATION SPECIFICATIONS.

3. Any modifications to the manhole openings for installation of the liners is to be considered incidental and included in the CIPP cost.

4. A combination of lining materials can be used throughout the project at the price bid per LF.

ITEM 22 - MANHOLE REHABILITATION - CEMENTITIOUS INTERIOR COATING, 48-INCH DIAMETER

ITEM 23 - MANHOLE REHABILITATION - CEMENTITIOUS INTERIOR COATING, 60-INCH DIAMETER

1. This item of work shall consist of all labor, materials and equipment required to complete the installation of cementitious liner in circular manholes of the size indicated as shown on the CONTRACT DRAWINGS, in accordance with Section 2737 of the REHABILITATION SPECIFICATIONS and as directed by the Engineer.

2. Measurement and payment per actual vertical linear foot of manhole, rehabilitation, of each size, under this item will be made in accordance with Section 2737.04.01 of the REHABILITATION SPECIFICATIONS.

ITEM 24 - MANHOLE REHABILITATION - CEMENTITIOUS INTERIOR COATING, NON-CIRCULAR

1. This item of work shall consist of all labor, materials and equipment required to complete the installation of cementitious liner in non-circular standard sized manholes as shown on the CONTRACT DRAWINGS, in accordance with Section 2737 of the REHABILITATION SPECIFICATIONS and as directed by the Engineer.

2. Measurement and payment per square foot of manhole rehabilitation under this item will be made in accordance with Section 2737.04.01 of the STANDARD REHABILITATION SPECIFICATIONS.

ITEM 25 - MANHOLE REHABILITATION – EPOXY INTERIOR COATING, 48-INCH DIAMETER

1. This item of work shall consist of all labor, materials and equipment required to complete the installation of epoxy liner as shown on the

CONTRACT DRAWINGS, in accordance with Section 2737 of the REHABILITATION SPECIFICATIONS and as directed by the Engineer.

2. Measurement and payment per actual vertical linear foot of manhole rehabilitation under this item will be made in accordance with Section 2737.04.01 of the REHABILITATION SPECIFICATIONS.

ITEM 26 - REBUILD BENCH AND CHANNEL

1. This item of work shall consist of all labor, materials and equipment required to complete the work required to rebuild the bench and channels as shown on the CONTRACT DRAWINGS, in accordance with Plate G-15 of the STANDARD DETAILS, Sections 2737 of the of the REHABILITATION SPECIFICATIONS and as directed by the Engineer.

2. Measurement and payment per each manhole bench and channel rebuilt under this item will be made in accordance with Section 2737.04.02 of the REHABILITATION SPECIFICATIONS.

ITEM 27 - REPAIR PIPE SEAL

1. This item of work shall consist of all labor, materials and equipment required to complete the pipe seal repairs for 8 to 33-inch pipes as shown on the CONTRACT DRAWINGS, in accordance with Plate G-13 of the STANDARD DETAILS, Sections 2737 of the of the REHABILITATION SPECIFICATIONS and as directed by the Engineer.

2. Measurement and payment per each pipe seal repair completed shall be paid for at the Contract unit price.

3. The unit price shall include, but is not limited to, furnishing all labor, materials and equipment necessary to complete the repair of cracked or broken pipe seals including all work necessary to stop leaks at the connection and between the penetration of the pipe through the manhole wall.

ITEM 28 - AIR TEST AND CHEMICALLY GROUT SERVICE CONNECTIONS AND FIRST JOINT SECTIONS

1. This item of work shall consist of all labor, materials and equipment required to complete the chemical grouting of service connections and first joint sections and air testing of such repairs as directed, in

accordance with Section 2738 of the of the REHABILITATION SPECIFICATIONS and as directed by the Engineer.

2. Measurement and payment shall be made per gallon of grout pumped for each service connection, including the first joint section, under this item and will be made in accordance with Section 2738.04.03 of the REHABILITATION SPECIFICATIONS.

3. Locations to be evaluated and determined at the time of pre-CCTV. Additional work may be identified and required post liner installation.

ITEM 29 - BLAZE ORANGE HIGH VISIBILITY FENCE

1. This item of work shall consist of all labor, materials and equipment required to complete the furnishing and placing of blaze orange high visibility fence shown on the CONTRACT DRAWINGS and in accordance with Section SP-02901 of these SPECIAL PROVISIONS.

2. Work performed under this item shall be measured for payment and shall be paid for at the Contract unit price per linear foot of blaze orange high visibility fence installed.

3. The unit price shall include, but not limited to, furnishing all labor, materials, and equipment necessary to complete the work required and all related work as shown, specified and as directed by the Engineer.

~~ITEM 30 - MOUNTABLE BERM~~ **DELETED**

~~1. This item of work shall consist of all labor, materials and equipment required to complete a mountable berm as shown on the CONTRACT DRAWINGS and as directed by the Engineer.~~

~~2. Measurement and payment shall be paid at the Contract unit price per each linear foot of mountable berm.~~

~~3. The unit price per linear foot of mountable berm actually installed shall include and cover furnishing all labor, materials and equipment necessary to complete the work required; to include, but not limited to, furnishing, installing, maintaining, and removing the aggregate, geotextile and drain pipe required for the mountable berm, and all related work as shown, specified or directed.~~

~~ITEM 31 - STABILIZED CONSTRUCTION ENTRANCE~~ **DELETED**

1. This item of work shall consist of all labor, materials and equipment required to complete the stabilized construction entrances as shown on the CONTRACT DRAWINGS, in accordance with Section 308 of the STANDARD SPECIFICATIONS and as directed by the Engineer.

2. Measurement and payment shall be paid at the Contract unit price per each for stabilized construction entrance.

3. The unit price per each of stabilized construction entrances actually installed shall include and cover furnishing all labor, materials and equipment necessary to complete the work required; to include, but not limited to, furnishing, installing, maintaining, and removing the aggregate, geotextile and drain pipe required for the stabilized construction entrance, and all related work as shown, specified or directed.

ITEM 32 - TEMPORARY ACCESS BRIDGE **DELETED**

1. These items of work shall consist of all labor, materials and equipment required to complete each temporary access bridge across Patapsco River tributaries as shown on the CONTRACT DRAWINGS and as directed by the Engineer.

2. Measurement and payment shall be paid at the Contract unit price per each temporary access bridge installed.

3. The unit price per each temporary access bridge installed shall include the installation and removal of the temporary access bridge, abutment and structures as required, protection and stabilization of disturbed stream beds and cover furnishing all labor, materials and equipment necessary to complete the work required.

ITEM 33 - SAND BAG DIVERSION **DELETED**

1. These items of work shall consist of all labor, materials and equipment required to complete a sand bag diversion as shown on the CONTRACT DRAWINGS and as directed by the Engineer.

2. Measurement and payment shall be paid at the Contract unit price per each linear foot of sand bag diversion installed.

3. ~~The unit price per each linear foot of sand bag diversion installed shall include the installation, protection and stabilization of the sand bag diversion and cover furnishing all labor, materials and equipment necessary to complete the work required.~~

ITEM 34 - CONTINGENT ADJUSTING AND REPLACING FENCES, SHRUBS, TREES, HEDGES, ETC.

1. This item of work consists of providing all material, labor, and equipment necessary to complete the adjustments and/or replacements of all existing fencing, shrubs, trees, etc. in accordance with Section 110 of the STANDARD SPECIFICATIONS and as directed by the Engineer.

2. Work performed under this item will not be measured for payment but will be paid for at the Contract lump sum price in accordance with Section 110.04 of the STANDARD SPECIFICATIONS.

ITEM 35 - CONTINGENT STANDARD SANITARY PRE-CAST MANHOLE, 48-INCH DIAMETER

1. This item of work shall consist of all labor, materials and equipment required to complete the replacement of existing cleanouts with new 48-inch manholes as directed by the Engineer and in accordance with Plate S-4 of the STANDARD DEATILS, Sections SP-01900, SP-02200, and SP-02605 of these SPECIAL PROVISIONS and Section 362 of the STANDARD SPECIFICATIONS.

2. Measurement and payment per vertical foot under this item will be made in accordance with Section 362.04.01 of the STANDARD SPECIFICATIONS.

3. The unit price per vertical foot of 48-inch diameter pre-cast sanitary sewer manholes actually installed under this item shall include and cover furnishing all labor, materials, and equipment necessary to complete the work required in accordance with Section 362 of the STANDARD SPECIFICATIONS, also including, but not limited to; removal and proper disposal of existing cleanout; exterior joint sealer; manhole steps; pre-cast concrete grade rings; A-Lok pipe connections, excavation and backfill, by-pass pumping if required, stone bedding, bracing, acceptance testing and dewatering including proper disposal of water and all incidentals and related work as shown, specified or directed.

ITEM 36 - CONTINGENT STANDARD SANITARY HEAVY TRAFFIC MANHOLE FRAME AND COVER, 24-INCH DIAMETER

1. This item of work consists of providing all material, labor, and equipment necessary to complete furnishing all 24-inch diameter standard sanitary heavy traffic manhole frames and covers on new manholes in accordance with Plates G-3 and S-8 of the STANDARD DETAILS, Section SP-02605 of these SPECIAL PROVISIONS and Section 362 of the STANDARD SPECIFICATIONS and as directed by the Engineer.

2. Measurement and payment per each unit installed under this item shall be made in accordance with 362.04.02 of the STANDARD SPECIFICATIONS and as directed by the engineer.

ITEM 37 - CONTINGENT WATERTIGHT SANITARY MANHOLE FRAME AND COVER, 24-INCH DIAMETER

1. This item of work shall consist of all labor, materials and equipment required to complete the replacement of manhole frames and covers on existing manholes with watertight frame and covers when directed by the Engineer in accordance with Plate S-13 of the STANDARD DETAILS, Section 2737 of the of the REHABILITATION SPECIFICATIONS and as directed by the Engineer.

2. Measurement and payment per each manhole frame and cover replaced under this item will be made in accordance with Section 2737.04.08 of the REHABILITATION SPECIFICATIONS.

ITEM 38 - CONTINGENT ACCESS ROADS

1. This item of work shall consist of all labor, materials and equipment required to install appropriate access roads as shown on the as directed by the Engineer, accordance with Section 2731.03.02 of the of the REHABILITATION SPECIFICATIONS and as directed by the Engineer.

2. Measurement and payment shall be made per square yard access road installed under this item and will be made in accordance with Section 2731.04.04 of the REHABILITATION SPECIFICATIONS.

ITEM 39 - CONTINGENT EXCAVATED POINT REPAIRS IN ROAD RIGHT-OF-WAY, 8- TO 16-INCH

1. This item of work shall consist of all labor, materials and equipment required to complete excavated point repairs in 8- through 16-inch sewer located within the road right-of-way as required to complete the lining, up to 18 feet of cover. Work shall be completed in accordance with Plates G-6, G-6A, G-7, S-7 and R-38 of the STANDARD DETAILS, Sections SP-01900, SP-02200, and SP-02600 of these SPECIAL PROVISIONS, Section 361 of the STANDARD SPECIFICATIONS, Section 2744 of the REHABILITATION SPECIFICATIONS, and as directed by the Engineer.

2. Measurement and payment per actual linear foot of pipe installed for the repair of 8- to 16-inch sewer as measured horizontally along the centerline of the trench for the length of the repair, including fittings, under this item will be made in accordance with Section 2744.04 of the REHABILITATION SPECIFICATIONS.

ITEM 40 - CONTINGENT EXCAVATED POINT REPAIRS OUTSIDE OF ROAD RIGHT-OF-WAY, 8- TO 16-INCH

1. This item of work shall consist of all labor, materials and equipment required to complete excavated point repairs in 8- through 16-inch sewer located outside the road right-of-way as required to complete the lining, up to 18 feet of cover. Work shall be completed in accordance with Plates G-6, G-6A, and S-7 of the STANDARD DETAILS, Sections SP-01900, SP-02200, and SP-02600 of these SPECIAL PROVISIONS, Section 361 of the Standard Specifications, Section 2744 of the REHABILITATION SPECIFICATIONS, and as directed by the Engineer.

2. Measurement and payment per actual linear foot of pipe installed for the repair of 8- through 16-inch sewer as measured horizontally along the centerline of the trench for the length of the repair, including fittings, under this item will be made in accordance with Section 2744.04 of the REHABILITATION SPECIFICATIONS.

ITEM 41 - CONTINGENT AIR TESTING DEFECTS, 8- TO 16-INCH

1. This item of work shall consist of all labor, materials and equipment required to complete air testing of defects in 8- through 16-inch pipe in accordance with Section 2738 of the of the REHABILITATION SPECIFICATIONS and as directed by the Engineer.

2. Measurement and payment shall be made per each defect tested under this item and will be made in accordance with Section 2738.04.01 of the REHABILITATION SPECIFICATIONS.

ITEM 42 - CONTINGENT AIR TESTING DEFECTS, 18- TO 33-INCH

1. This item of work shall consist of all labor, materials and equipment required to complete air testing of defects in 18- through 33-inch pipe in accordance with Section 2738 of the of the REHABILITATION SPECIFICATIONS and as directed by the Engineer.

2. Measurement and payment shall be made per each defect tested under this item and will be made in accordance with Section 2738.04.01 of the REHABILITATION SPECIFICATIONS.

ITEM 43 - CONTINGENT AIR TEST AND CHEMICALLY GROUT DEFECTS, 8- TO 16-INCH

1. This item of work shall consist of all labor, materials and equipment required to complete the chemical grouting of defects in 8- through 16-inch pipe and air testing of such repairs in accordance with Section 2738 of the of the REHABILITATION SPECIFICATIONS and as directed by the Engineer.

2. Measurement and payment shall be made per gallons of grout pumped at each defect under this item will be made in accordance with Section 2738.04.02 of the REHABILITATION SPECIFICATIONS.

ITEM 44 - CONTINGENT AIR TEST AND CHEMICALLY GROUT DEFECTS, 18- TO 33-INCH

1. This item of work shall consist of all labor, materials and equipment required to complete the chemical grouting of defects in 18- through 33-inch pipe and air testing of such repairs in accordance with Section 2738 of the of the REHABILITATION SPECIFICATIONS and as directed by the Engineer.

2. Measurement and payment shall be made per gallons of grout pumped at each defect under this item will be made in accordance with Section 2738.04.02 of the REHABILITATION SPECIFICATIONS.

ITEM 45 - CONTINGENT SUPPLEMENTAL HEAVY CLEANING OF MAIN LINES, 8- to 16-INCH

1. This item of work shall consist of all labor, materials and equipment required to complete supplemental heavy cleaning, including root, obstruction, and grease removal in 8- through 16-sewer pipe in

accordance with Section 2741 of the REHABILITATION SPECIFICATIONS and as directed by the Engineer.

2. Measurement and payment per actual linear foot of pipe cleaned for 8- through 16-inch sewer as measured from centerline of manhole to centerline of manhole horizontally along the center line of the cleaned pipes including all labor, will be made in accordance with Section 2741.04.03 of the REHABILITATION SPECIFICATIONS.

ITEM 46 - CONTINGENT SUPPLEMENTAL HEAVY CLEANING OF MAIN LINES, 18- to 33-INCH

1. This item of work shall consist of all labor, materials and equipment required to complete supplemental heavy cleaning, including root, obstruction, and grease removal in 18- through 33-sewer pipe in accordance with Section 2741 of the REHABILITATION SPECIFICATIONS and as directed by the Engineer.

2. Measurement and payment per actual linear foot of pipe cleaned for 18- through 33-inch sewer as measured from centerline of manhole to centerline of manhole horizontally along the center line of the cleaned pipes including all labor, will be made in accordance with Section 2741.04.03 of the REHABILITATION SPECIFICATIONS.

ITEM 47 - CONTINGENT SUPPLEMENTAL HEAVY CLEANING OF LATERALS

1. This item of work shall consist of all labor, materials and equipment required to complete supplemental heavy cleaning, including root, obstruction, and grease removal from 4 and 6-inch laterals in accordance with Section 2741 of the REHABILITATION SPECIFICATIONS and as directed by the Engineer.

2. Measurement and payment will be paid at the prices bid per linear foot as measured from the centerline of the mainline service connection to the centerline of the upstream access structure (i.e. cleanout) horizontally along the center line of the cleaned laterals for cleaning of laterals 4 to 6 inches and shall be in accordance with Section 2741.04.04 of the REHABILITATION SPECIFICATIONS.

ITEM 48 - CONTINGENT MIX NO. 2 CONCRETE

1. This item of work shall consist of all labor, materials and equipment to furnish and place Mix No. 2 concrete for restoration of miscellaneous structures including but not limited to roads, curbs, gutters, footways,

etc. when directed by the Engineer in accordance with Sections 305, 609, 610 and 902 of the STANDARD SPECIFICATIONS.

2. Measurement and payment shall be per cubic yard of the actual quantity of Mix No. 2 concrete placed when directed by the Engineer.

3. Payment is not made for restoration of items within the limits shown on the drawings. Payment is never made for replacement of damaged structures when the damage is due, in any way, to the Contractor's fault or negligence.

ITEM 49 - CONTINGENT 6–INCH UTILITY UNDERDRAINS

1. This item of work shall consist of all labor, materials and equipment required to complete the utility underdrains when directed by the Engineer in accordance with Section 306 of the STANDARD SPECIFICATIONS, and Standard Detail Plate R-22 for County roads or the MDSHA Standards MD 387.01 through 378.21-01, as applicable.

2. Measurement and payment per linear foot installed under this item shall be in accordance with Section 306.04 of the STANDARD SPECIFICATIONS when directed by the engineer.

ITEM 50 - CONTINGENT GEOTEXTILE

1. This item of work shall consist of all labor, materials and equipment required to complete the furnishing and placing of geotextile for trench subgrade stabilization when directed by the Engineer in accordance with Section SP-02200 of these SPECIAL PROVISIONS.

2. Measurement and payment shall be per square yard of the actual quantity of geotextile furnished and placed when directed by the Engineer.

ITEM 51 - FIXED PRICE CONTINGENT TEST PIT EXCAVATION/ CONVENTIONAL EXCAVATION METHODS

1. This item of work shall consist of all labor, materials and equipment required to complete the excavation of test pits when directed by the Engineer and in accordance with Sections 109, as amended by these special provisions, and 205 of the STANDARD SPECIFICATIONS. Work does not include test pits associated with locating any existing utilities shown on the CONTRACT DRAWINGS.

2. Measurement and payment per cubic yard under this item shall be at the fixed Contract unit price per cubic yard. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work. Tamped backfill will not be measured but the cost will be incidental to the Contract unit price per each Test Pit excavated. The excavation will be allowed to be left open and plated for up to five (5) days where it is deemed safe by the engineer. Any restoration or pavement to be replaced will not be measured but the cost will be incidental to the Contract unit price per each Test Pit excavated.

ITEM 52 - FIXED PRICE CONTINGENT BORROW FOR BACKFILLING TRENCHES WITH PROPER DISPOSAL OF UNSUITABLE MATERIAL

1. This item of work shall consist of all labor, materials and equipment required to complete the furnishing and placing of material when directed by the Engineer in accordance with Sections 109, as amended by these special provisions, and 203 of the STANDARD SPECIFICATIONS.

   Measurement and payment per cubic yard under this item shall be made in accordance with Section 109.04, as amended by these special provisions, of the STANDARD SPECIFICATIONS when directed by the Engineer.

ITEM 53 - FIXED PRICE CONTINGENT CLASS 3 EXCAVATION/SELECT BACKFILL WITH PROPER DISPOSAL OF UNSUITABLE MATERIAL

1. This item of work shall consist of all labor, materials and equipment required to complete Class 3 Excavation with select backfill with proper disposal of unsuitable material when directed by the Engineer in accordance with Sections 109, as amended by these special provisions, 301, and 302 of the STANDARD SPECIFICATIONS.

2. Measurement and payment per cubic yard under this item shall be in accordance with Section 109.04, as amended by these special provisions, of the STANDARD SPECIFICATIONS when directed by the Engineer.

ITEM 54 - FIXED CONTINGENT MIX NO. 1 CONCRETE

1. This item of work shall consist of all labor, materials and equipment to provide Mix No. 1 concrete when directed by the Engineer in

accordance with Sections 109 and 902 of the STANDARD SPECIFICATIONS.

2. Measurement and payment shall be per cubic yard of the actual quantity of Mix No. 1 concrete placed when directed by the Engineer.

ITEM 55 - FIXED PRICE FINAL ACCEPTANCE TV INSPECTION, 8- TO 33-INCH

1. This item of work shall consist of all labor, materials and equipment to provide final acceptance TV Inspection in accordance with Sections 2742 of the REHABILITATION SPECIFICATIONS and as directed by the Engineer.

2. Measurement and payment per actual linear foot of CCTV footage reviewed and approved by the County under this item in accordance with Section 2742.04.03 of the REHABILITATION SPECIFICATIONS.

PART 2 - MATERIALS

Not Used

PART 3 - CONSTRUCTION

Not Used

PART 4 - MEASUREMENT AND PAYMENT

Not Used

END OF SECTION

SECTION 2733

PIPE REHABILITATION BY PULLED-IN-PLACE GLASS REINFORCED PLASTIC (GRP) CIPP METHOD (PER ASTM F2019)

2733.01 DESCRIPTION

2733.01.01 Reference. All applicable requirements of other portions of the Contract Documents apply to the Work of this Section.

2733.01.02 Description of Work. These specifications include requirements for all design, materials, transportation, equipment and labor necessary to rehabilitate deteriorated sections of sewer listed in the contract documents by means of cured-in-place thermosetting resin pipe (CIPP) liner, using the pulled in place installation of glass reinforced plastic (GRP), per ASTM F2019. This specification is intended to identify the minimum requirements of the County.

2733.01.03 Submittals After the Notice of Award. The Contractor shall have ten (10) working days after the date of award to submit the following information to the County for review and approval. Failure to do so may be grounds for termination of contract. This shall be in addition to the information required pursuant to Section 2731.

(a) Certification documentation concerning date, type of resin, mixing ratio, liner thickness, temperature, type of glass fiber, liner type, manufacturing date, and last installation date.

(b) Certification from resin manufacturer regarding approval of resin dye quantity and type.

(c) Information on the maximum allowable tensile stress for the tube, from the manufacturer.

(d) Shop drawings and product data to identify materials of construction (including resins, catalysts, fabric, etc.), tube material manufacturer, location of the manufacturing facility, location of the wet-out facility, etc. All GRP CIPP liner shall be manufactured from this designated wet-out facility throughout the entire Contract unless specifically approved otherwise by the County in writing. Multiple wet-out facilities shall not be allowed.

(e) Calculations supporting the GRP CIPP liner thicknesses for nominal interceptor pipe diameters greater than 18-inches. Calculations shall be based on ASTM F1216 assuming a "partially deteriorated" host pipe condition. The data shall include the registered Professional Engineer sealed liner thickness calculations for each installation. Upon review and approval by the County, the proposed installed thicknesses will be considered the contracted design thicknesses. The thickness test results, addressed in this Specification, will be compared against the proposed installed thickness (not minimum design thicknesses). The calculations shall be sealed by a registered Professional Engineer and an executed copy of the following form shall be provided:

Professional Engineer Certification Form

The undersigned hereby certifies that he/she is a Professional Engineer registered in the State of Maryland and that he/she is employed by:
_____(Name of Contractor)
to design the required liner segments. The undersigned further certifies that he/she has performed the design of the specified liner diameters and thicknesses in accordance with the specific installation requirements of this project and that the design is in conformance with all applicable local, state, and federal codes, rules, and regulations. It is further certified that the signature and Professional Engineer stamp will be affixed to all calculations and drawings used in, and resulting from the design.

The undersigned hereby agrees to make all original design drawings and calculations available to the Owner within seven (7) days following the Owner's request.

Professional Engineer Stamp _____

*By*_____

(f) A complete description of the proposed wet-out procedure for the proposed technology.

(g) Provide data on the maximum allowable stresses and elongation of the tube during installation and the means in which the Contractor will monitor stress and elongation.

(h) Description of monitoring system for proposed curing method.

2733.01.04 **Submittals After Notice to Proceed.** The Contractor shall submit the information listed below, after the Notice to Proceed, for review and approval. This shall be in addition to the information required pursuant to Section 2731.

(a) If requested, wet-out forms with detailed information including, but not limited to, roller gap settings, type of resin, volume and mixing ratios, type of glass fibers, wet out start times and dates, wet out locations, finish times, gel times, resin injection locations, and any other pertinent data documenting the wet-out for each section of GRP CIPP liner manufactured.

(b) GRP CIPP liner curing reports documenting the liner installation for all sewer segments. The GRP CIPP liner reports shall document all details of liner installation, including manhole numbers, street names/sewer location, project

number, date, time, temperature, curing temperature, curing time, GRP CIPP liner thickness, etc. A sample report shall be submitted to the County for approval prior to the installation of any GRP CIPP lining.

(c) A full protocol for time, rate of travel of the ultraviolet assembly, pressures, and amount of lamps in operation shall be maintained and recorded automatically from the beginning of inflation of the liner until the end of the curing. This information shall include project name, address, section, and date to clearly identify the rehabilitated section.

(d) Product Warranty and Certification Form: To insure that all products and materials proposed for use on this project are of the highest quality and specifically designed and manufactured for the intended installation or use, a Product Warranty and Certification Form shall be completed by the rehabilitative product manufacturer(s), manufacturer's representative or vendor as well as the Cured-In-Place Pipe (CIPP) liner installer certifying that the product(s) they are proposing to use is specifically designed for the intended application, installation and/or function. Failure to complete this form may prevent the product(s) from being used on this project.

PRODUCT WARRANTY AND CERTIFICATION FORM

REFERENCE (PROJECT NAME AND CONTRACT NUMBER):_____

THE UNDERSIGNED HEREBY ATTESTS THAT HE HAS EXAMINED ALL THE REFERENCED PROJECT INFORMATION, PROJECT INSTALLATION REQUIREMENTS AND THE CONTRACT SPECIFICATIONS AND HEREBY WARRANTS AND CERTIFIES THAT THE REHABILITATION PRODUCTS THAT THEY PROPOSE TO FURNISH, DELIVER AND INSTALL FOR THIS PROJECT MEETS OR EXCEEDS THE REQUIREMENTS OF THESE CONTRACT SPECIFICATIONS, IS SUITABLE FOR THE INTENDED PURPOSE AND INSTALLATION, AND WILL SATISFACTORILY PERFORM TO THE CRITERIA SPECIFIED. THIS WARRANTY SHALL BE IN ADDITION TO, AND NOT IN LIEU OF, ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED.

PRODUCT:_____

MANUFACTURER:_____

Address:

By:_____
(Typed Name and Title) (SEAL)

_____ /s/ _____
(Signature) (Date)

The Product Warranty and Certification must be signed by a Principal Person (President, Vice-President, etc.) of the Product's Manufacturer. In the event the manufacturer is not the Supplier then a Principal Person of the Supplier must also sign this form.

MANUFACTURER'S REPRESENTATIVE/VENDOR:_____

Address:

By:_____
(Typed Name and Title) (SEAL)

_____ /s/ _____
(Signature) (Date)

The Product Warranty and Certification must be signed by a Principal Person (President, Vice-President, etc.) of the Installation Contractor. In the event the manufacturer is not the Installation Contractor then a Principal Person of the Installation Contractor must also sign this form.

INSTALLATION CONTRACTOR:_____

Address:

By:_____
(Typed Name and Title) (SEAL)

_____ /s/ _____
(Signature) (Date)

2733.02 MATERIALS

2733.02.01 **The Liner.** The liner shall generally consist of a corrosion resistant seamless fiberglass fabric tube impregnated with thermosetting (cross-linked) resin and filler material, if applicable. The fabric tubing material shall consist of at least two separate tubes made of corrosion resistant (E-CR or equivalent) glass fibers and external foils in accordance with ASTM D578. The liner system shall meet the requirements of ASTM F2019 and ASTM D5813 and shall be constructed to withstand a pulling force at least equal to the weight of the liner, tolerate circumferential changes in the pipe, withstand curing temperatures, and have sufficient strength to bridge missing pipe. The liner shall fit tightly to the internal circumference of the existing pipe and, once cured, the liner shall have a chemically inert internal flow surface. The liner shall be fabricated with an under measurement of at least 1% of the host pipe's nominal diameter. The liner shall also have the ability to over-expand by at least 1% of the host pipe's diameter to insure that when the liner is installed, it will neatly fit the internal circumference of the pipe to be lined. All GRP CIPP linings shall be from a single manufacturer. The cured liner shall have a 50-year life span.

2733.02.02 **External Foils.** The tube-shaped plastic foils shall make up the outer one or more layers of the liner. The foils shall be moisture resistant, light proof (in the case of UV cure), and impermeable to styrene (when a styrene based resin is used).

2733.02.03 **Calibration Hose.** The calibration hose is the tube shaped impermeable bladder that serves as the innermost layer of the GRP CIPP liner. During the cure of the liner, the calibration hose shall be inflated, pushing the liner firmly against the existing pipe. The calibration hose shall be a tube of either plastic foil or resin-saturated coated felt that is resistant and impermeable to moisture, styrene (when styrene based resin is used), and temperatures up to 260°F while also exposed to the installation pressure used to expand the liner. Once curing is complete, the calibration hose shall be easily removed.

2733.02.04 **Wall Thickness.** The required structural GRP CIPP wall thickness shall be designed in accordance with the guidelines in Appendix X1 of ASTM F1216. The thickness of GRP liner shall be defined as the thicknesses of all of the fiberglass layers plus the external foils. The minimum liner thickness for nominal pipe diameters of 8 to 12 inches shall be 4.0 mm. Minimum liner thickness for nominal pipe diameters of 14 to 16 inches shall be 6.0 mm. Minimum liner thickness for nominal pipe diameters of 18 inches shall be 7.0 mm. GRP CIPP wall thickness for nominal interceptor pipe diameters larger the 18 inches shall be designed by the Contractor in accordance Appendix X1 of ASTM F1216 assuming a "partially deteriorated" as specified by 2733.01.03(e). In cases where ovality exceeds 10%, or where pipes are egg or oval shaped, alternative methods of design may be considered by the Engineer. The categories of design parameters noted in Tables 2733-1, 2733-2, and 2733-3 in Section 2733, Pipe Rehabilitation by Pulled-In-Place Glass Reinforced Plastic (GRP) CIPP Method (Per ASTM F2019) shall be used, unless otherwise directed by the County. The selected thicknesses shall be uniform for each pipe diameter and shall be based on the thickest, most conservative design wall thickness calculated for each diameter.

2733.02.05 **Common Design Parameters:** Design inputs generally considered to be the same from site to site for a particular project are provided in Table 2733-1.

Table 2733-1 Common Design Parameters	
Safety Factor (1)	2.0
Soil Modulus (2)	700 psi
Soil Density (3)	120 pcf

Notes Table 2733-1:

1. The safety factor may be reduced to 1.5 at the discretion of the Engineer, normally in the case where there is accurate and detailed information known about the existing pipe and soil conditions.

2. In the absence of site-specific information, the County assumes a soil modulus of 700 psi.

3. In the absence of site-specific information, the County assumes a soil density of 120 pcf.

2733.02.06 **Site Specific Parameters:** The information listed in Table 2733-2 is specific to each manhole to manhole run of pipe. The Contractor shall use for design the information provided by the County and information the Contractor collects during site visits for each manhole to manhole run.

Table 2733-2 Site-Specific Design Parameters	
Ovality	Notes 1, 2
Ground Water Depth Above Invert	Notes 1, 3
Soil Depth Above Crown	Note 1
Live Load	Notes 1, 4
Design Condition (Fully Deteriorated)	Notes 1, 5
GRP CIPP Thickness	Notes 1, 6, 7

Notes Table 2733-2:

1. Design thicknesses and complete site-specific designs, as stated herein, in accordance with ASTM F1216 **(Appendix X1)**, shall be submitted after the Notice of Award.

2. The Contractor shall estimate the ovality by viewing the video, data and notes provided in the Contract Documents, and any other information provided by the

County. If videos are not available, and the Contract Plans do not state otherwise, the Contractor shall assume an ovality of 3%. In cases where the ovality exceeds 10%, the Contractor may consider employing alternative design methods (such as beam design methods) to determine the pipe thickness, at no additional cost to the County.

3. In the absence of accurate water table information or high water elevation observed during the site visit (stream, ponds, etc.), the Contractor shall assume a seasonal groundwater elevation variation of 0 feet below the ground surface.

4. GRP CIPP is subjected to traffic live loads as calculated by AASHTO Standard Specifications for Highway Bridges, HS20-44 Highway Loading.

5. The Contractor shall assume the pipe segments are fully deteriorated.

6. Thicknesses specified (designed by the Contractor and approved by the County) are the final, in-ground thicknesses required. Measured sample thicknesses will not include polyurethane or polyethylene coatings, any layer of the tube not fully and verifiably impregnated with resin, or any portion of the tube not deemed by the County to be a structural component of the composite.

7. The Contractor must consider any factors necessary to ensure the final, cured-in-place pipe thickness is not less than specified (designed by the Contractor and approved by the County) above. These factors include any stress applied to the material during transportation, handling, installation and cure; the host pipe's material type, condition, and configuration; weather (including ambient temperature conditions); and any other factors which are reasonably expected to be found in existing sanitary sewer systems.

2733.02.07 **Initial Structural Properties.** Once cured, the GRP CIPP liner shall have the initial structural properties shown in Table 2733-3.

TABLE 2733-3
GRP CIPP INITIAL STRUCTURAL PROPERTIES(1)

PROPERTY	TEST METHOD	MINIMUM VALUE, PSI	(MPA)
Flexural Strength	D790	6500(2)	45
Flexural Modulus	D790	725000	5000
Tensile Strength	D3039/D3039M	9000	62
	D638	9000	62

Notes Table 2733-3:

1. The values in Table 2733-3 are for test results on field specimens. The Contractor shall obtain information on the material's long-term structural properties from the manufacturer.

2. The value indicates minimum strength both in the circumferential and longitudinal direction.

2733.02.08 Resin Content.

(a) The resin system shall be compatible to the installation process. The system shall consist of one of the following:

(1) A chemically resistant polyester or vinyl ester thermoset (heat or UV light cured) resin and catalyst system.

(2) An epoxy resin and hardener.

(b) The initiating temperature for heat cured resin systems shall be less than 180°F.

(c) When using a UV light cured resin system, a photo-initiator system must be added to the resin before the liner is impregnated.

(d) Dye shall be added to resins to improve visual inspection of the cured liner. The types and quantities of dyes added shall have prior approval from resin manufacturer.

2733.02.09 Chemical Resistance: The chemical resistance of the cured inner surface of the resin/fabric matrix shall be tested in accordance with ASTM D543. The result of exposure to the chemical solutions listed in Table 2733-4 shall produce loss of not more than 20 percent of the initial physical properties when tested in accordance with ASTM D543 for a period of not less than 1 year at a temperature of 73.4 ºF plus or minus 3.6 ºF. For applications other than municipal wastewater, conduct chemical resistance tests with actual samples of the fluid to be transported in the pipe and in accordance with procedures approved by the County. The cured liner shall also be chemically and physically resistant to external exposure of soil bacteria, moisture, roots, and chemical attack that may be due to material in the surrounding ground.

TABLE 2733-4
CONCENTRATIONS OF CHEMICAL SOLUTIONS FOR CHEMICAL RESISTANCE TEST

CHEMICAL SOLUTION	CONCENTRATION, %
Tap Water (pH 6-9)	100
Nitric Acid	5
Phosphoric Acid	10
Sulfuric Acid	10
Petroleum Hydrocarbon Based Fuels (e.g. Gasoline, diesel, etc.)	100
Vegetable Oil[1]	100

Detergent[2]	0.1
Soap[2]	0.1
Domestic Sewage*	100

[1.] Cotton seed, corn, or mineral oil
[2.] As per ASTM D543
* Contractor to include a written statement that their material and resin combination has been successfully installed in the United States and is chemically resistant to domestic sanitary sewage.

2733.02.10 Manufacture Information.

(a) The Contractor shall deliver the uncured resin impregnated liner system to the site. Unless otherwise approved by the County, the liner shall not be impregnated at the site. The application of the resin to the fabric tube (wet-out) shall be conducted under factory conditions and the materials shall be fully protected against UV light, excessive heat, and contamination at all times. The equipment used to impregnate the liner with resin shall contain devices that properly distribute the resin. The liner system shall be impregnated with resin not more than 72 hours before the proposed time of installation and stored out of direct sunlight. Continuously monitor liner materials during transport and storage with a temperature recorder and data storage. If requested, the Contractor shall furnish the County with the recorder readings before installation. Material that is exposed to temperatures outside of the manufacturer's limits will be rejected. The Contractor shall provide all appropriate transport, handling and protection equipment including refrigerated, or otherwise suitably cooled, transport equipment in accordance with the manufacturer's requirements.

(1) Heat Cure: The uncured resin impregnated liner system shall be stored at a temperature within the manufacturer's acceptable range. During the transportation of the resin impregnated liner, a data logger shall continuously record the time and temperatures experienced by the liner.

(2) UV Light Cure: The impregnated liner shall be stored, transported, and installed according to the manufacturer's recommendations. During this time, the impregnated liner shall only be subjected to temperatures between 45°F and 95°F.

(b) All fabricating and Contractor testing shall be carried out under cover and no materials shall be exposed to the weather until they are ready to be inserted. All materials should be protected from the weather and exposure to ultra-violet light as practicable during the manufacture and installation process.

(c) Each liner shall be accompanied by suitable documentation indicating date, manufacturer, trade name, time and date of manufacture, liner thickness, number of layers, diameter, length of liner, resin type, resin volume, mixing ratio, temperature, type of glass fiber, liner type, catalyst, relevant batch numbers, storage limitations – with the last allowable installation date accompanying the

impregnated tube - and requirements, etc. and this information shall be submitted to the County.

2733.03 CONSTRUCTION REQUIREMENTS

2733.03.01 Lining Procedures.

(a) The Contractor will not be compensated for liners ordered without confirmation of length and field conditions.

(b) The liner shall be installed in accordance with ASTM F2019.

(c) The Contractor shall conduct operations in accordance with applicable OSHA standards, including those safety requirements involving work on an elevated platform and entry into a confined space. Take suitable precautions to eliminate hazards to personnel near construction activities when pressurized air is being used.

(d) All service locations shall be measured for location prior to liner installation. All service connection measurements and the clockwise position of the openings shall be recorded in a log to aid in the reinstatement of service connections after lining. The approximate locations of identified active service taps are shown on the Contract Drawings; however, the Contractor shall determine the exact location and number of service connections by the dye test method or other methods approved by the County. The Contractor shall accurately field locate existing service connections, whether in service or not. For rehabilitated lines, the Contractor shall use existing service locations to reconnect service lines to new liner, unless otherwise specified on the Contract Drawings or directed by the County. During the line preparation and work operation, inactive sewer house connections shall not be cut but shall be left lined over, unless directed by the County.

(e) Thermocure

(1) Temperature monitoring systems are required for all 18” or larger sewer, any sized sewer in locations with significant known groundwater infiltration, or if the pipe is within 50 feet of stream, river or lake. This system shall be installed at the invert of the pipe and be installed per the manufacturers recommended procedures. The temperature sensors shall be placed at intervals as recommended by the sensor manufacturer. Additional sensors shall be placed where significant heat sinks are likely or anticipated. The sensors, if installed, shall be monitored by a computer using a tamper proof data base that is capable of recording temperatures at the interface of the liner and the host pipe. Temperature monitoring systems shall be Zia Systems, Vericure by Pipeline Renewal Technologies, or approved equal.

(f) In the event of insertion being delayed after impregnation by unexpected site conditions but prior to the start of the insertion process, the Contractor shall store, at their own cost, the liner, for a further period of at most 72 hours, for use when conditions allow.

(g) Installation through Manholes. The invert shall be continous and smooth through all manholes. If a liner is installed through a manhole, the bottom portion of the liner shall remain and the bench of the manhole shall be grouted and shaped as necessary to support the liner. If the liner terminates on either side of a manhole, the invert shall be built up to remove any flow restrictions and to form a continuous invert through the manhole. The cost of this work shall be included in the unit price bid for the liner.

(h) The finished pipelining shall be continuous over the entire length of an insertion run between two manholes or structures and be as free as commercially practicable from visual defects such dry spots, lifts, and delamination. The lining shall be impervious and free of leakage from the pipe to the surrounding ground or from the ground to the inside of the lined pipe. Defects that will impede flow or maintenance equipment will not be permissible. Pinholes and leaking patches will not be allowed. If found they must be repaired, per the manufacturer's recommendations, at the Contractor's expense.

(i) The inner surface shall be free of cracks and crazing with smooth finish and with an average of not over two pits per 12 inch square, providing the pits are less than 0.12 inch in diameter and not over 0.04 inch deep and are covered with sufficient resin to avoid exposure of the inner fabric. Some minor waviness, that in the County's opinion will not appreciably decrease the flow characteristics or be the cause of a possible blockage, shall be permissible.

2733.03.02 Installation.

(a) A power winch shall be used to pull the wet-out liner through an exiting manhole into place within the pipe. The Contractor shall use one of the following installation methods:

(1) Sliding Foil and Winch Cable: Once the pipe is properly cleaned according to Section 2741, Sewer Line, Lateral, and Manhole Cleaning, a sliding foil and winch cable shall be pulled through the line. The sliding foil shall cover up to half of the circumference of the pipe and it shall be held in place by the plug used to block the flow in the manhole.

(2) Pulling Head or Pulling Manifold and Invert Roller: The liner shall be connected to the winch cable by either a pulling head or pulling manifold. The addition of a swivel connection to the pulling cable can be used to prevent the liner from twisting. An invert guide roller in the winch manhole shall be used to bring the pulling head or manifold into the manhole during the pulling operation.

i. A pulling head can be created by making the end of the liner into a loop. Once the pulling operation is complete, the pulling head shall be dismantled.

ii. If a pulling manifold is used, care shall be taken when it is attached to the end of the liner and the Contractor shall assure that the strength of the connection can adequately transfer the pulling force. The manifold shall be mounted airtight into the calibration hose.

(b) The liner shall be pulled at the speed recommended by the manufacturer.

(c) The liner shall be pulled carefully into place. Care shall be taken when pulling the liner through any obstacles or friction within the pipe. The liner shall not be damaged as a result of the pulling operation.

(d) Elongation of the tube liner shall be less than 2% of the overall length after the pulling operation is complete.

(e) The liner shall extend 1 to 2 ft into the access point and an inlet manifold shall be mounted to it.

(f) Temperature sensors shall be located on the outside of the liner about 1 ft from the access and termination points.

(g) For a steam cure, there shall be manifolds connected at both the inlet and outlet air/steam hoses. Temperature and pressure sensors shall be located on the inlet manifold.

2733.03.03 Curing Methods. The liner shall be cured using one of the following methods:

(a) Steam Cure

(1) The installation equipment shall include an inlet air/steam hose, air compressor, acceptable steam source, and monitoring and control equipment in accordance with the manufacturer's recommendations. There shall also be an outlet air/steam hose mounted to a gauge station that has a pressure adjustment valve, temperature gauge, and pressure gauge.

(2) The liner shall be inflated with adequate pressure to hold the liner tightly against the pipe wall. Once the correct pressure is reached, the outlet valve shall be used to maintain this pressure.

(3) Once the liner is inflated, the temperature shall be adjusted according to the manufacturer's recommendations. The temperature shall be monitored by the sensors that are attached to the liner until the recommended temperature is reached. Time, temperatures, and pressures shall be recorded continuously throughout the curing process and submitted to the County at the end of the installation. This log will insure that the proper curing of the liner was carried out.

(4) If recommended by the manufacturer, a post curing steam shall be conducted in order to fully develop the chemical resistance and resin strength of the liner.

(5) The Contractor shall gradually cool the liner down by replacing the steam in the line with air and water, if necessary. The temperature, measured by the sensors attached to the liner, shall be lowered to 90°F or as recommended by the manufacturer.

(6) Once the cure is complete, the manifolds and then the calibration hose shall be detached and removed from the line.

(b) Ultraviolet Light Cure

(1) The installation equipment shall include an inlet air hose, air compressor, and a multi-lamp ultraviolet curing assembly in accordance with the manufacturer's recommendations.

(2) A camera must be located on the UV light assembly to enable the video inspection of the liner and to insure that the liner has been properly inflated and any liner problems can be identified before curing begins.

(3) The liner shall be expanded under pressure until tightly pressed against the wall of the pipe.

(4) The multi-lamp ultraviolet curing assembly shall be tuned or optimized to the resin's photo initiator system or the photo initiator system with the curing system.

(5) Once the ultraviolet curing assembly and the resin's photo initiator system are in tune, the ultraviolet curing lights shall be drawn through the pipe. Sufficient pressure shall be applied to continuously keep the liner tight against the pipe wall during the curing process. The speed at which the ultraviolet curing assembly travels through the pipe shall be the calculated speed required for cross-linking/polymerization of the resin.

(6) Time, rate of travel of the ultraviolet assembly, pressures, and amount of lamps in operation shall be recorded continuously from the beginning of inflation until the curing is complete and submitted to the County at the end of the installation. The log shall include project name, address, section, and date. This log will insure that the proper curing of the liner was carried out.

2733.03.04 Testing.

(a) The Contractor shall collect representative coupon samples/specimens as described below. At a minimum, a coupon shall be collected for each pipe diameter that is lined and each liner thickness, unless otherwise specified in writing by the County. For every 1,000 linear feet of GRP CIPP liner installed for the first 10,000 linear feet, the Contractor shall perform sampling and testing at their expense and shall supply results to the County. The frequency of testing may be reduced as approved by the County after sufficient tests are performed to verify the GRP CIPP liner design, production, and installation procedures. Likewise, the frequency of testing may be increased by the County and performed by the Contractor at no additional cost to the County when the required tests show that the installed GRP CIPP liner does not meet the specifications. After the 10,000 feet of acceptable test results are received, the test sample frequency can be reduced to one sample every 2,000 feet as long as samples continue to meet all minimum standards and sampling results are received in a timely manner. If a test is not passed, the lining will not be accepted. The Contractor shall stamp or mark

the test pieces with the date of manufacture and batch number. These samples shall be paid for under the Pay Item for sanitary sewer rehabilitation, for the respective diameter sizes.

(b) Testing shall be performed by an ASTM-certified independent testing laboratory. The Contractor shall submit to the County the name and location of the independent testing laboratory, a certified statement from the laboratory indicating that they are independent from and not associated with the Contractor in any way, and the ASTM certification for the independent testing laboratory.

(c) All expenses for sampling and testing of the installed liner shall be paid for by the Contractor. The cost of all manufacturer's testing to qualify products furnished to the project site shall be the responsibility of the Contractor.

(d) Sampling shall conform to ASTM F2019 and the following requirements: The samples shall be cut from a section of cured CIPP at an intermediate manhole or at the termination point that shall be installed through a like diameter section of conduit or other tubular restraining means. The specimens shall allow circumferential (hoop) directions of the fiberglass reinforcement in the CIPP. Each specimen shall be at least 2" wide (axial direction of the liner, along the length) to test a representative amount of fibers if glass roving mats have been used. The samples are to be tested in a curved beam configuration where the minimum beam width is 2.0 inches.

(e) The Contractor shall verify that the installed thickness of the GRP CIPP is within minus 5 percent and plus 10 percent of the specified thickness. An ASTM-certified independent testing laboratory shall test the samples to determine the installed liner thickness, and shall be measured in accordance with ASTM D5813. Flexural properties shall be determined in accordance with ASTM D790. The Contractor shall label and date all samples and provide to the inspector or Owner's representative the same day of the installation for shipping to the independent testing laboratory. The County shall be copied on all transmittals to the independent testing laboratory.

(f) Should the County desire to make additional independent tests, the Contractor shall, upon request of the County, furnish any reasonable number of test pieces of raw material samples as the County may require, stamped or marked with the date of manufacture and batch number if applicable.

(g) The test specimen shall be prepared and physical properties tested in accordance with ASTM F2019. The properties shall meet or exceed the values identified in ASTM F2019.

(h) It is preferred that all samples be shipped to the independent laboratory the same day as installation. At the Contractor's discretion, samples may be sent in batches but in no case later than 30 days after installation. The results of the measurements for each sample shall be submitted to the County within 30 days of the sample's ship date to the laboratory. The costs for testing shall be included in the bid price for rehabilitation including the cost of all manufacturer's testing to qualify products furnished to the project site.

(i) Any GRP CIPP lining that does not meet the specified installed strength and/or thickness requirements, regardless of the amount below the specified requirements, shall be corrected by the Contractor in a manner approved by the County at no additional cost to the County. The County's decision on how to correct the deficient GRP CIPP liner installations shall be final. Options for correcting deficient GRP CIPP liner installations that will be considered by the County include the following: removal of the existing GRP CIPP liner and re-lining the sewer, open-cut replacement of the sewer from manhole to manhole, or re-lining the sewer with the existing GRP CIPP liner in place.

2733.04 MEASUREMENT AND PAYMENT

2733.04.01 Glass Reinforced Plastic Cured-in-Place Pipe Lining. Measurement for payment will be the actual linear footage installed, measured along the centerline of the pipe. Length will be measured from edge of manhole to edge of manhole, unless the liner extends through a manhole, in which case the distance to and from that manhole will be measured to the center of that manhole. Payment is based on the GRP CIPP thickness required for the deepest flow line of the rehabilitated segment.

(a) **Basis of Payment.** Payment shall be made at the contract unit price bid per linear foot of pipe rehabilitated. The unit price includes all labor, incidentals, materials, resident notification, flow control, preconstruction video taping, confined space entry and equipment, sediment and root removal, debris collection and disposal, removal of protruding service connections (protruding less than ½ inch into the main pipeline), re-establishing lateral service connections, dewatering, traffic control, erosion and sediment control, excavation pits, pre- and post-cleaning, pre and post-installation CCTV inspection including submission of videos and television logs, warranty inspections, sealing the liner in the manholes and at service connections, required compliance tests, initial and general backfill and compaction, borrow for backfilling, offsite disposal of unsuitable material, pavement removal and disposal, site cleanup, and all other rehabilitation work, not included under other items, necessary to complete the rehabilitation as specified. Payment for this item does not indicate final acceptance of this item; final acceptance is contingent on the receipt, review, and approval of the Final Acceptance TV Inspection described in Section 2742.

END OF SECTION

CONTRACT PROPOSAL

PATAPSCO SEWERSHED STRUCTURAL REHABILITATION - TASK D
CONTRACT NUMBER: 19007 SXO
WORKDAY NUMBER 010777207
JOB ORDER NUMBER: 201-0077-7207
CALENDAR DAYS: 850

Contract No. 19007 SX0
Addendum No. 2
Revised, May 6, 2025

CONTRACTOR: _____
ADDRESS: _____
PHONE: _____

BID ITEM	COMM. CODE		DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL AMOUNT
1	130850		MOBILIZATION	LS	1		$
2			DELETED	0	0	$0.00	$0.00
3			EXCAVATED POINT REPAIRS, 8 INCH	LF	17		$
4			EXCAVATED POINT REPAIRS, 10 INCH	LF	8		$
5			EXCAVATED POINT REPAIRS, 18 INCH	LF	167		$
6			REPLACEMENT OF HOUSE CONNECTION AND LATERAL TO REHABILITATED MAIN LINES	LF	100		$
7			SEWER HOUSE CONNECTION LATERAL SEALS (SHCLS)	EA	161		$
8			REMOVAL OF PROTRUDING SERVICE CONNECTIONS	EA	198		$
9			CURED-IN PLACE PIPE LINING, 8 INCH	LF	63,658		$
10			CURED-IN PLACE PIPE LINING, 10 INCH	LF	4,775		$
11			CURED-IN PLACE PIPE LINING, 12 INCH	LF	5,691		$
12			CURED-IN PLACE PIPE LINING, 15 INCH	LF	3,316		$

13			CURED-IN PLACE PIPE LINING, 16 INCH	LF	24		$
14			CURED-IN PLACE PIPE LINING, 18 INCH	LF	8,291		$
15			CURED-IN PLACE PIPE LINING, 20 INCH	LF	3,643		$
16			CURED-IN PLACE PIPE LINING, 21 INCH	LF	662		$
17			CURED-IN PLACE PIPE LINING, 22 INCH	LF	352		$
18			CURED-IN PLACE PIPE LINING, 24 INCH	LF	1,778		$
19			CURED-IN PLACE PIPE LINING, 27 INCH	LF	442		$
20			CURED-IN PLACE PIPE LINING, 30 INCH	LF	2,946		$
21			CURED-IN PLACE PIPE LINING, 33 INCH	LF	849		$
22			MANHOLE REHABILITATION - CEMENTITIOUS INTERIOR COATING, 48-INCH DIAMETER	VLF	7,409		$
23			MANHOLE REHABILITATION - CEMENTITIOUS INTERIOR COATING, 60-INCH DIAMETER	VLF	84		$
24			MANHOLE REHABILITATION - CEMENTITIOUS INTERIOR COATING, NON-CIRCULAR	SF	70		$
25			MANHOLE REHABILITATION - EPOXY INTERIOR COATING, 48-INCH DIAMETER	VLF	183		$
26			REBUILD BENCH AND CHANNEL	EA	6		$
27			REPAIR PIPE SEAL	EA	5		$
28			AIR TEST AND CHEMICALLY GROUT SERVICE HOUSE CONNECTIONS AND FIRST JOINT SECTIONS	GAL	1,850		$
29			BLAZE ORANGE HIGH VISIBILITY FENCE	LF	78,000		$
30			DELETED	0	0	$0.00	$0.00
31			DELETED	0	0	$0.00	$0.00

32			DELETED	0	0	$0.00	$0.00
33			DELETED	0	0	$0.00	$0.00
34		C	CONTINGENT ADJUSTING AND REPLACING FENCES, SHRUBS, TREES, HEDGES, ETC.	LS	1		$
35		C	CONTINGENT STANDARD SANITARY PRE-CAST MANHOLE, 48-INCH DIAMETER	VLF	8		$
36		C	CONTINGENT STANDARD SANITARY HEAVY TRAFFIC MANHOLE FRAME AND COVER, 24-INCH DIAMETER	EA	1		$
37		C	CONTINGENT WATERTIGHT SANITARY MANHOLE FRAME AND COVER, 24-INCH DIAMETER	EA	5		$
38		C	CONTINGENT ACCESS ROADS	SY	500		$
39		C	CONTINGENT EXCAVATED POINT REPAIRS IN ROAD RIGHT-OF-WAY, 8 TO 16-INCH	LF	13		$
40		C	CONTINGENT EXCAVATED POINT REPAIRS OUTSIDE OF ROAD RIGHT-OF-WAY, 8 TO 16-INCH	LF	37		$
41		C	CONTINGENT AIR TESTING DEFECTS, 8 TO 16-INCH	EA	150		$
42		C	CONTINGENT AIR TESTING DEFECTS, 18 TO 33-INCH	EA	95		$
43		C	CONTINGENT AIR TEST AND CHEMICALLY GROUT DEFECTS, 8 TO 16-INCH	GAL	600		$
44		C	CONTINGENT AIR TEST AND CHEMICALLY GROUT DEFECTS, 18 TO 33-INCH	GAL	570		$
45		C	CONTINGENT SUPPLEMENTAL HEAVY CLEANING OF MAIN LINES, 8 TO 16-INCH	LF	8,394		$
46		C	CONTINGENT SUPPLEMENTAL HEAVY CLEANING OF MAIN LINES, 18 TO 33-INCH	LF	1,979		$
47		C	CONTINGENT SUPPLEMENTAL HEAVY CLEANING OF LATERALS	LF	35		$
48		C	CONTINGENT MIX NO. 2 CONCRETE	CY	10		$
49	800110	C	CONTINGENT 6 - INCH UTILITY UNDERDRAINS	LF	200		$
50		C	CONTINGENT GEOTEXTILE	SY	50		$