ADDENDUM NO. 5
TO
CONTRACT DOCUMENTS AND SPECIFICATIONS
FOR
ROCKY RIVER INTERCEPTOR REHABILITATION PROJECT
CONTRACT NO. SRP-W-ARP-0053.3 - WSACC

Issued: March 6th, 2026

To: All Official Plan Holders

The following revisions, additions, and clarifications are hereby made part of the Contract Documents for the above-referenced project and shall be taken into account in the preparation of all Bids and the execution of all Work. All items in conflict with the Addenda are hereby deleted. This addendum is made part of the Contract Documents and shall be acknowledged on Page 2 of the Bid Form.

I. CONTRACT DOCUMENTS

Ad-5-1. Section 00300 – Bid Form, **REPLACE** in its entirety with attached, Bid Form, revised. Added Lump Sum Line Items for Mobilization, Temporary Bypass Pumping, and Site Access for each specified rehabilitation area. Line Items include manhole and mainline rehabilitations.

II. TECHNICAL SPECIFICATIONS

Ad-5-2. Section 33 01 36 – Manhole Rehabilitation. **REPLACE** in its entirety with attached, Manhole Rehabilitation, revised. Removed Temporary Bypass Pumping from included items for Comprehensive, Standard, and Minor manhole rehabilitations. Removed requirement for manhole vacuum testing for manholes receiving full cementitious lining.

Ad-5-3. Section 01 22 00 – Measurement and Payment. **REPLACE** in its entirety with attached, Measurement and Payment, revised. Added Lump Sum Line Items for Mobilization, Temporary Bypass Pumping, and Site Access for each specified rehabilitation area. Removed Temporary Bypass Pumping from included items for Comprehensive, Standard and Minor manhole rehabilitations. Removed requirement for manhole vacuum testing for manholes receiving full cementitious lining.

III. PROJECT PERMITS

Ad-5-4. None.

IV. QUESTIONS / RESPONSES

Ad-5-5. Q1: Can temporary bypass pumping operations discharge to parallel sanitary sewer systems?

A1: The hydraulic model for the Rocky River Sewer Interceptor did not indicate any locations of pipe surcharging when dry-weather flow from the existing 30-inch line was diverted to the existing 48-inch line in both the northern and the southern parallel sections. This analysis assumed flow from the incoming Kings Grant Easement was also bypassed to the existing 48-inch line. However, the hydraulic model for the interceptor did indicate several locations of pipe surcharging when dry-weather flow from the 48-inch was bypassed to the 30-inch in both the northern and the southern parallel sections of the interceptor. Any rehabilitations requiring temporary bypass pumping on the 48-inch line must be bypassed to downstream 48-inch or larger pipe segments. Any rehabilitations on the 30-inch line can be performed with flow bypassed to the 48-inch line at the contractor's discretion.

Respectfully submitted,

HDR Engineering, Inc. of the Carolinas

Channin H. Bennett, PE
Project Manager

Digitally signed by Bennett, Channin Hyde
DN: E=Channin.Bennett@hdrinc.com, CN="Bennett, Channin Hyde", OU=Users, OU=Winston-Salem-100 North Main Street, OU=North Carolina, OU=United States, OU=Offices, DC=intranet, DC=hdr
Date: 2026.03.06 14:59:54-05'00'

NORTH CAROLINA REGISTERED SEAL 026966 ENGINEER CHANNIN H. BENNETT

Attachments:

Section 00300 – Bid Form, Revised
Section 33 01 36 – Manhole Rehabilitation, Revised
Section 01 22 00 – Measurement and Payment, Revised

BID FORM

PROJECT IDENTIFICATION:

Rocky River Interceptor Rehabilitation Project

THIS BID IS SUBMITTED TO:

Water and Sewer Authority of Cabarrus County
232 Davidson Highway
Concord, NC 28027

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

2.01. Bidder accepts all of the terms and conditions of the Invitation to Bid and the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 60 days after the day of bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner. Bidder will sign and submit the Agreement with the Bonds and other documents required by the Bidding Documents within 10 days after the date of Owner's Notice of Award.

3.01. In submitting this Bid, Bidder represents that:

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

No. _____ Dated _____

No. _____ Dated _____

No. _____ Dated _____

No. _____ Dated _____

No. _____ Dated _____

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

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

D. Bidder has carefully studied all reports of explorations and tests of subsurface conditions at or contiguous to the site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site (except underground facilities) which have been identified in the Supplementary Conditions as provided in Paragraph 4.02 of the General Conditions, and reports and drawings of a hazardous environmental condition, if any, which has been identified in the Supplementary Conditions as provided in Paragraph 4.06 of the General Conditions.

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

F. Bidder does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid or performance of the Work at the price(s) bid and within the

times and in accordance with the other terms and conditions of the Bidding Documents.

G. Bidder is aware of the general nature of Work to be performed by Owner and others at the site that relates to the Work indicated in the Bidding Documents.

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

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

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

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

4.01. Bidder will complete the Work for the following unit prices, computed in accordance with Paragraph 11.03.B of the General Conditions. Bidder acknowledges that estimated quantities are not guaranteed and are solely for the purpose of comparison of Bids, and that final payment for all Unit Price Bid items will be based on actual quantities provided, determined as provided in the Contract Documents.

UNIT PRICE SCHEDULE
ROCKY RIVER INTERCEPTOR REHABILITATION PROJECT

No.	Manhole Rehab Project Area	Description	Units	Quant.	Unit Price	Item Total
1	D/S of Weddington Road to Project Limit on 014052	Comprehensive Manhole Rehab	EA	31		
2	D/S of Weddington Road to Project Limit on 014052	Standard Manhole Rehab	EA	10		
3	D/S of Weddington Road to Project Limit on 014052	Minor Manhole Rehab	EA	2		
4	D/S of Weddington Road to Project Limit on 014052	Project Area Mobilization	LS	1		
5	D/S of Weddington Road to Project Limit on 014052	Project Area Temporary Bypass Pumping	LS	1		
6	D/S of Weddington Road to Project Limit on 014052	Project Area Site Access	LS	1		
7	D/S of 011750 to Weddington Road – on 30" or 48"	Comprehensive Manhole Rehab	EA	5		
8	D/S of 011750 to Weddington Road – on 30" or 48"	Standard Manhole Rehab	EA	10		
9	D/S of 011750 to Weddington Road – on 30" or 48"	Minor Manhole Rehab	EA	3		
10	D/S of 011750 to Weddington Road – on 30" or 48"	Project Area Mobilization	LS	1		
11	D/S of 011750 to Weddington Road – on 30" or 48"	Project Area Temporary Bypass Pumping	LS	1		
12	D/S of 011750 to Weddington Road – on 30" or 48"	Project Area Site Access	LS	1		
13	D/S of PT Road to D/S of Derita Road at 011750	Comprehensive Manhole Rehab	EA	1		
14	D/S of PT Road to D/S of Derita Road at 011750	Standard Manhole Rehab	EA	26		
15	D/S of PT Road to D/S of Derita Road at 011750	Minor Manhole Rehab	EA	3		
16	D/S of PT Road to D/S of Derita Road at 011750	Project Area Mobilization	LS	1		
17	D/S of PT Road to D/S of Derita Road at 011750	Project Area Temporary Bypass Pumping	LS	1		
18	D/S of PT Road to D/S of Derita Road at 011750	Project Area Site Access	LS	1		
19	D/S of NC-73 to Poplar Tent Road	Standard Manhole Rehab	EA	27		

20	D/S of NC-73 to Poplar Tent Road	Project Area Mobilization	LS	1		
21	D/S of NC-73 to Poplar Tent Road	Project Area Temporary Bypass Pumping	LS	1		
22	D/S of NC-73 to Poplar Tent Road	Project Area Site Access	LS	1		
23	Upper Rocky River - U/S of NC 73	Comprehensive Manhole Rehab	EA	3		
24	Upper Rocky River - U/S of NC 73	Standard Manhole Rehab	EA	17		
25	Upper Rocky River - U/S of NC 73	Project Area Mobilization	LS	1		
26	Upper Rocky River - U/S of NC 73	Project Area Temporary Bypass Pumping	LS	1		
27	Upper Rocky River - U/S of NC 73	Project Area Site Access	LS	1		
28	Anywhere on Project Plans	Add. Frame & Cover Replace	EA	10		
29	Anywhere on Project Plans	Add. Frame & Seal Replace	EA	10		
30	Anywhere on Project Plans	Add. Cementitious Manhole Lining	VF	100		
31	Anywhere on Project Plans	Add. Pipe Connection Grouting	EA	10		
32	Anywhere on Project Plans	Add. Manhole Wall Grouting	GAL	10		
33	Anywhere on Project Plans	Add. Manhole Bench Rehab	EA	10		
34	Anywhere on Project Plans	Add. Manhole Vent Pipe Replace	EA	10		
35	Anywhere on Project Plans	Epoxy Manhole Lining	VF	100		
				Total Manhole Rehabilitation Bid		

No.	Pipe Rehab Project Area	Description	Units	Quant.	Unit Price	Item Total
36	D/S of Weddington Road to Project Limit on 014052 (USMH 014074 - DSMH 012254)	6 LF CIPP Patch (30-inch PVC)	LF	6		

37	D/S of Weddington Road to Project Limit on 014052 (USMH 014074 - DSMH 012254)	430 LF CIPP After Patch (30-inch PVC)	LF	430		
38	D/S of Weddington Road to Project Limit on 014052 (USMH 014068 - DSMH 014067)	6 LF CIPP Patch (48-inch PVC)	LF	6		
39	D/S of Weddington Road to Project Limit on 014052 (USMH 014065 - DSMH 014064)	6 LF CIPP Patch (48-inch PVC)	LF	6		
40	D/S of Weddington Road to Project Limit on 014052 (USMH 014060 - DSMH 014059)	6 LF CIPP Patch (54-inch PVC)	LF	6		
41	D/S of Weddington Road to Project Limit on 014052 (USMH 014082 - DSMH 014081)	460 LF CIPP (48-inch PVC)	LF	460		
42	D/S of 011750 to Weddington Road-on 30" or 48" (USMH 011750 - DSMH 014103)	6 LF CIPP Patch (48-inch RCP)	LF	6		
43	D/S of PT Road to D/S of Derita Road at 011750 (USMH 011765 - DSMH 011764)	265 LF of CIPP (36-inch PVC)	LF	265		
44	D/S of PT Road to D/S of Derita Road at 011750 (USMH 011768 - DSMH 011767)	497 LF of Clean & CCTV (36-inch PVC)	LF	497		
45	D/S of PT Road to D/S of Derita Road at 011750 (USMH 011762 - DSMH 011761)	6 LF CIPP Patch (36-inch PVC)	LF	6		
46	D/S of PT Road to D/S of Derita Road at 011750 (USMH 011781 - DSMH 011780)	140 LF of Clean & CCTV (36-inch PVC)	LF	140		
47	D/S of PT Road to D/S of Derita Road at 011750 (USMH 011754B - DSMH 011752)	499 LF of CIPP (48-inch RCP)	LF	499		
48	D/S of PT Road to D/S of Derita Road at 011750 (USMH 011754A - DSMH 011754B)	32 LF of CIPP (48-inch RCP)	LF	32		

49	D/S of PT Road to D/S of Derita Road at 011750 (USMH 011761 - DSMH 011760)	272 LF of Clean & CCTV (48-inch DIP)	LF	272		
50	D/S of PT Road to D/S of Derita Road at 011750 (USMH 011756 - DSMH 011755)	221 LF of CIPP (48-inch RCP)	LF	221		
51	D/S of NC-73 to Poplar Tent Road (USMH 011794 - DSMH 011841)	144 LF of CIPP (36-inch PVC)	LF	144		

Total Pipe Rehabilitation Bid _____

Total Manhole + Pipe Rehabilitation Bid _____

Total Project Bid _____

5.01. Bidder agrees that all excavation is unclassified.

5.02. Bidder agrees that the Work will be substantially completed within 200 days, and completed and ready for final payment in accordance with Paragraph 14.07.B of the General Conditions within 230 days, after the commencement of Contract Times as defined in the General Conditions.

5.03. Bidder accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work within the times specified above.

6.01. Communications concerning this Bid shall be sent to Bidder at the following address:

HDR Engineering, Inc. of the Carolinas
555 Fayetteville Street Suite 900
Raleigh, NC 27601
C/O Susan Faith (phone: 919-900-1632 email: susan.faith@hdrinc.com)

7.01. The terms used in this Bid have the meanings indicated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

SIGNATURE OF BIDDER

Contractor's License Number _____

License Expiration Date _____

If an Individual

By _____
(signature of individual)

doing business as _____

Business address _____

_____

Phone No. _____

Date _____, 20_____

ATTEST _____ TITLE _____

If a Partnership

By _____
(firm name)

_____
(signature of general partner)

Business address _____

_____

Phone No. _____

Date _____, 20_____

ATTEST _____ TITLE _____

If a Corporation

By _____
(corporation name)

By _____
(signature of authorized person)

_____
(title)

Business address _____

_____

Phone No. _____

Date _____, 20_____

ATTEST _____ TITLE _____

(SEAL)

If a Joint Venture (Other party must sign below.)

Contractor's License Number _____

License Expiration Date _____

If an Individual

By _____
(signature of individual)

doing business as _____

Business address _____

_____

Phone No. _____

Date _____, 20_____

ATTEST _____ TITLE _____

If a Partnership

By_____
(firm name)

_____
(signature of general partner)

Business address _____

_____

Phone No. _____

Date _____, 20_____

ATTEST _____ TITLE _____

If a Corporation

By_____
(corporation name)

By_____
(signature of authorized person)

_____
(title)

Business address _____

_____

Phone No. _____

Date _____, 20_____

ATTEST _____ TITLE _____

(SEAL)

SECTION 33 01 36
MANHOLE REHABILITATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Requirements for rehabilitating existing manholes, including inspection of manholes, structure cleaning, infiltration control, manhole lining, bench and invert rehabilitation, resetting manhole frames and covers, and replacing manhole frames and/or covers.

B. Related Specification Sections include but are not necessarily limited to:

1. Division 00 - Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 - General Requirements.
3. Section 01 22 00 – Measurement and Payment (Reference for “Comprehensive”, “Standard”, and “Minor” descriptions of manhole rehabilitation materials, methods, and / or component installations).
4. Section 33 01 32 - Sewer Pipe and Structure Cleaning.

C. Manhole Rehabilitation Category Descriptions:

1. Comprehensive Manhole Rehabilitation: Full compensation for all labor, equipment, and materials required for or incidental to the work, including manhole inspection and cleaning, all measures to control infiltration or repair defective areas of manhole (patching and plugging), manhole lining including manhole invert, inside drop structure removal and replacement, frame and cover removal and replacement, frame / chimney seal replacement, and site restoration.
2. Standard Manhole Rehabilitation: Full compensation for all labor, equipment, and materials required for or incidental to the work, including manhole inspection and cleaning, all measures to control infiltration or repair defective areas of manhole (patching and plugging), manhole lining to top of manhole bench only unless otherwise noted on the plans, inside drop structure removal and replacement, frame / chimney seal replacement, and site restoration.
3. Minor Manhole Rehabilitation: Full compensation for all labor, equipment, and materials required for or incidental to the work, including manhole inspection and cleaning, all measures to control infiltration or repair defective areas of manhole (patching and plugging), frame / chimney seal replacement, and site restoration.

1.2 QUALITY ASSURANCE

A. Qualifications:

1. Contractor or Subcontractor to perform manhole rehabilitation and manhole lining:
    a. Prepared to complete the work.
        1) In a manner:
            a) Timely.
            b) Satisfactory.
        2) Fully:

a) Qualified.

b) Experienced.

c) Equipped.

2. Applicator/subcontractor:

a. For each product:

1) Licensed, certified and/or approved.

a) In writing.

b) By Manufacturer.

b. Minimum experience:

1) Successfully installed and completed:

a) Five projects:

(1) In last five years

(2) With similar scope and products.

b) 500 manholes:

(1) With proposed manhole rehabilitation system.

c. Capable of providing crews as needed.

1) To complete work without undue delay.

B. Referenced Standards:

1. ASTM International (ASTM), latest revision of each:

a. C109 – Compressive Strength of Hydraulic Cement Mortars.

b. C150 – Portland Cement.

c. C177 – Thermal Conductivity.

d. C191 – Time of Setting of Hydraulic Cement by Vicat Needle.

e. C234 – Comparing Concrete on the Basis of the Bond Developed with Reinforcing Steel.

f. C267 – Chemical Resistance of Mortars, Grouts, and Monolithic Surfacings and Polymer Concretes.

g. C293 – Flexural Strength of Concrete.

h. C309 – Liquid Membrane Forming Compounds for Curing Concrete.

i. C321 – Bond Strength of Chemical-Resistant Mortars.

j. C457 – Microscopical Determination of Parameters of the Air-Void System in Hardened Concrete.

k. C496 – Splitting Tensile Strength of Cylindrical Concrete Specimens.

l. C596 – Drying Shrinkage of Mortar Containing Portland Cement.

m. C579B – Compressive Strength of Chemical-Resistant Mortars, Grouts and Monolithic Surfacing.

n. C642 – Density, Absorption, and Voids in Hardened Concrete.

o. C666 – Resistance of Concrete to Rapid Freezing and Thawing.

p. C882 – Bond Strength of Epoxy-Resin Systems Used with Concrete by Shear Slant.

q. C900 – Pullout Strength of Hardened Concrete.

r. C1072 – Measurement of Masonry Flexural Bond Strength.

s. C1244 – Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill.

t. D368 – Tensile Properties of Plastics.

u. D412 – Vulcanized Rubbers and Thermoplastic Elastomers-Tension.

v. D638 – Tensile Properties of Plastics.

w. D790 – Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

x. D903 – Peel or Stripping Strength of Adhesive Bonds.

y. D1004 – Tear Resistance (Graves Tear) or Plastic Film and Sheeting.

z. D1737 – Flexibility.

aa. D2240 – Rubber Property – Durometer Hardness.

bb. D4060 – Abrasion Resistance.

cc. D4414 – Plain and Steel-Laminated Elastomeric Bearings for Bridges.

dd. D4541 – Adhesion.

ee. D4787 – Continuity Verification of Liquid or Sheet Lining Applied to Concrete Substrates.

ff. E96 – Permeability.

gg. F1869 – Measuring Moisture Vapor Emission Rate of Concrete.

hh. F2414-04 – Sealing Sewer Manholes Using Chemical Grouting.

ii. G14 – Impact.

C. Occupational Safety and Health Administration (OSHA).

1.3 SUBMITTALS

A. Shop Drawings:

1. See Section 01 33 00 – Submittals.

B. Existing manhole condition:

1. Photographs and/or videos.
    a. Digital.
2. After cleaning.
3. After final product installation.

C. Product technical data:

1. Acknowledgement that products submitted meet requirements of standards referenced.
2. Manufacturer’s installation instructions.
3. Complete characteristics:
    a. Physical.
    b. Chemical.
4. Chemical resistance information.

5. Manufacturer's recommendations for:
    a. Coating.
    b. Adhesives.
    c. Primer.
    d. Grout.
    e. Patch material.
    f. Crack fillers.
    g. Thinners.
6. Warranty documentation.

D. Applicator's qualifications.

E. References:

1. Document experience required in paragraph 1.2A.2.b above.
2. Include:
    a. Type of installation.
    b. Square footage of material installed.
    c. Client contact:
        1) Name.
        2) Telephone number.

1.4 MATERIAL SUBSTITUTION

A. Materials specified are for specific service indicated.

B. Substitute products or manufacturers will be accepted if:

1. They are standard manhole or collection system products.
2. Engineer is satisfied that they are equal:
    a. In:
        1) Composition.
        2) Durability.
        3) Usefulness.
        4) Convenience.
    b. For intended purpose.
3. The following minimum conditions are met:
    a. Proposed coating system:
        1) Has dry film thickness equal to or greater than that of specified system.
        2) Employs a multi-coat system equal to number of coats specified.
        3) Employ coating of same generic type.
        4) Has been used in at least ten (10) similar projects:
            a) All at least three (3) years old.
            b) Where coating has been applied to similar:

(1) Exposure.

(2) Application.

b. Request for substitution includes:

1) Full information from manufacturer for application:

a) Descriptive literature.

b) Directions.

c) Copy of warranty.

2) Complete information:

a) Generic type.

b) Non-volatile content by volume.

c. If above data appears to be in order:

1) Engineer may require Contractor to provide certified laboratory data sheets showing test results:

a) Complete:

(1) Spectrographic.

(2) Durability.

b) Performed:

(1) On proposed substitute.

(2) By testing laboratory:

(a) Independent.

(b) Approved by Engineer.

c) All testing costs borne by Contractor.

d. Engineer shall be sole and final judge of any proposed substitution's acceptability.

C. Requests for substitution must be approved in writing.

1.5 WARRANTY

A. For cementitious liner and epoxy liner:

1. Provide three-year warranty:

a. For defects in:

1) Material.

2) Installation.

b. From:

1) Coating Manufacturer, and

2) Applicator.

2. Warrant product from:

a. Delaminating from substrate.

b. Degradation of finish.

c. Cracking.

d. Spalling.

e. Corrosion of substrate due to defects in finish.

3. During warranty period, either:
   a. Repair all lining defects.
      1) In manner satisfactory to Engineer.
   b. Re-apply lining
      1) At no cost to Owner.
4. Two years following substantial completion of manhole rehabilitation work:
   a. Owner/Engineer will inspect work to ensure proper performance.
   b. If any deficiencies are found:
      1) Repair at no additional cost to Owner.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Avoid damaging materials:

1. Including:
   a. Chemical grouts.
   b. Cementitious materials.
   c. Any other manhole rehabilitation products.
2. During:
   a. Shipping.
   b. Handling.
   c. Placement.

B. Store materials:

1. In manner recommended by Manufacturer.

C. Damaged materials:

1. Any materials that:
   a. Show deterioration, or
   b. Have been exposed to any adverse storage condition that may have caused damage.
      1) Even though no such damage can be seen.
2. Shall be:
   a. Marked as rejected
   b. Removed at once from the work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with Contract Documents, the following manufacturers are acceptable:

1. Hydrophilic polyurethane chemical grout:
   a. Avanti.

b. Approved equal.

2. Cementitious liner:
   a. Quadex Aluminaliner, by Quadex, Inc.
   b. SewperCoat, by LaFarge Aluminates.
   c. High Performance Mix, by StrongSeal Systems.
   d. Cemtec Silatec CAM, by A.W. Cook Cement, Inc.
   e. Permaform, by AP/M.
   f. Approved equal.
3. Epoxy liner:
   a. Raven 405, by Raven Lining Systems.
   b. SprayRoq.
   c. Approved equal.
4. Frame/Cone seal:
   a. Flex Seal Utility Sealant, by Sealing Systems, Inc.
   b. Approved equal.

B. Submit request for substitution in accordance with Section 01 25 13.

2.2 MATERIALS

A. Infiltration Control Material (Chemical Grout)
1. Stop active leaks and infiltration by injecting:
   a. Chemical grout.
   b. Through source.
   c. To outside of manhole.
2. Grout material:
   a. Shall be one of the following gels:
      1) Acrylamide
         a) Acrylamide base gel chemical sealing materials shall have the following characteristics:
            (1) A minimum of 10% acrylamide base material by weight in the total sealant mix. A higher concentration (%) of acrylamide base material may be used to increase strength or offset dilution injection.
            (2) The ability to tolerate some dilution and react in moving water during injection.
            (3) A viscosity of approximately 2 centipoise, which can be increased with additives.
            (4) A constant viscosity during the reaction period.
            (5) A controllable reaction time from 10 seconds to 1 hour.
            (6) The ability to increase mix viscosity, density, gel strength and resistance to shrinkage by the use of additives to the water.
      2) Acrylic

a) Acrylic base gel chemical sealing material shall have the following characteristics:

(1) A minimum of 10% acrylic base material by weight in the total sealant mix. A higher concentration (%) of acrylic base material may be used to increase strength of offset dilution during injection.

(2) The ability to tolerate some dilution and react in moving water during injection.

(3) A viscosity of approximately 2 centipoise, which can be increased with additives.

(4) A constant viscosity during the reaction period.

(5) A controllable reaction time from 5 seconds to 6 hours.

(6) The ability to increase the mix viscosity, density, and gel strength by the use of additives.

3) Urethane

a) Urethane gel chemical sealing material shall have the following characteristics:

(1) One part urethane prepolymer thoroughly mixed with between 5 and 10 parts of water weight. The recommended mix ratio is one part urethane prepolymer to 8 parts of water (11% prepolymer).

(2) A liquid prepolymer having a solids content of 77% to 83%, specific gravity of 1.04 (8.65 lbs./gal.) and a flash point of 20 degrees F.

(3) A liquid prepolymer having a viscosity of 600 to 1,200 centipoise at 70 degrees F that can be pumped through 500 feet of 1/2 -inch hose with a 1,000-psi head at a flow rate of 1 ounce per second.

(4) Water used to react the prepolymer shall have a pH between 5 and 9.

(5) A cure time of 80 seconds at 40 degrees F, 55 seconds at 60 degrees F, and 30 seconds at 80 degrees F, when 1 part prepolymer is reacted with 8 parts of water only. Cure time shall be adjustable by the use of additives.

(6) A relatively rapid viscosity to increase of the prepolymer / water mix. Viscosity shall increase from about 10 to 60 centipoise in the first minute for a 1 to 8 prepolymer / water ratio at 50 degrees F.

(7) The ability to increase mix viscosity, density, gel strength and resistance to shrinkage by the use of additives to the water.

b. Chemical additives:

1) Grouts injected into near-surface and chimney-corbel areas may require the addition of shrink control agents, gel reinforcing agents and accelerators as listed below:

a) Acrylamide Gel – Suggested Additive: Ethylene Glycol

b) Acrylic Gel - Suggested Additive: Ethylene Glycol

c) Urethane Gel - Suggested Additive: Gel Reinforcing Agent

2) Additives shall be included in the chemical mixes in accordance with the manufacturer's recommendations.

c. Required properties:

1) Volume stable.

2) Minimum compressive strength:

a) One-day: 50 psi.

b) 28-day: 250 psi.

d. Suitable for specific application:

1) Per Manufacturer's recommendation.

2) Formula suitable for frost exposure.

a) If applicable for regional climate.

3) Use hydrophilic polyurethane chemical grout for:

a) Drilling and injection method.

b) Exterior chemical curtain grouting method.

B. Patching Material:

1. The materials used shall be designed, manufactured, and intended for sewer manhole rehabilitation and the specific application in which they are used. The materials shall have a proven history of performance in sewer manhole rehabilitation. The materials shall be delivered to the job site in original unopened packages and clearly labeled with the manufacturer's identification and printed instructions. All material shall be stored and handled in accordance with recommendations of the manufacturer and the American Concrete Institute.

2. Cement plugging materials (for stopping active leaks in concrete and masonry manholes)

a. The plugging material shall be premixed fast-setting, volume-stable waterproof cement consisting of hydraulic cement, graded silica aggregates, and special plasticizing and accelerating agents. It shall not contain chlorides, gypsums, plasters, iron particles, aluminum power or gas-forming agents, or promote the corrosion of steel it may come in contact with. Set time shall be approximately 1 minute. Ten-minute compressive strength shall be approximately 500 psi and the 28-day compressive strength shall be a minimum of 5,000 psi when tested in accordance with ASTM C109.

3. Cement patching, repointing, filling, and repairing materials (for nonleaking holes, cracks, and spalls in concrete and masonry manholes)

a. The patching material shall be premixed nonshrink cement-based material consisting of hydraulic cement, graded silica aggregates, and special plasticizing and accelerating agents, which has been formulated for vertical or overhead use. It shall not contain chlorides, gypsums, plasters, iron particles, aluminum powder, or gas-forming agents or promote corrosion of steel it may come into contact with. Set time shall be less than 30 minutes, when tested in accordance with ASTM C191. One-hour compressive strength shall be a minimum of 200 psi and the 28-day compressive strength shall be a minimum of 5,000 psi, when tested in accordance with ASTM C109. Bond strength when tested in accordance with ASTM C882, shall be a minimum of 1,700 psi.

C. Cementitious Liner:

1. Calcium aluminate mortar.

2. Designed to:

a. Stop infiltration.

b. Restore structural integrity.

c. Protect against microbiologically-induced corrosion.

3. Spray applied to:

a. Form a structurally-enhanced monolithic liner.

b. Cover all interior substrate surfaces.

4. Minimum requirements:

Compressive Strength	ASTM C109	>3,000 psi (28 days)
Tensile Strength	ASTM C900	>800 psi
Flexural Strength	ASTM C293	>1,200 psi (28 days)
Shrinkage @ 90% R.H.	ASTM C596	<0.08% (28 days)
Freeze/Thaw	ASTM C666	No damage after 300 cycles
Air Void Content	ASTM C457	2-4% (7 days)
Specific Gravity/Absorption Test	ASTM C642	3-5% (7 days)
Bond Strength	ASTM C882	>1,600 psi (28 days)

D. Epoxy Liner:

1. Two-component epoxy resin system.
   a. 100% solids.
   b. Solvent-free.
   c. With select fillers to:
      1) Minimize permeability
      2) Provide sag resistance.
2. Minimum requirements:

Hardness, Shore D	ASTM D2240	88
Tensile Strength	ASTM D638	>7,000 psi
Flexural Strength	ASTM D790	>10,000 psi

E. Frame/Cone Seal:

1. Applied seals
   a. Achieved by applying a urethane resin compound:
      1) To internal surface between:
         a) Manhole frame.
         b) Cone section.
      2) To stop inflow under manhole frame.
   b. Seal to remain flexible.
      1) Allow for repeated frame movements:
         a) Vertical or horizontal.
         b) Due to:
            (1) Frost lift.
            (2) Ground movement.
            (3) Thermal movement of pavement.
   c. Minimum thickness: 120 mils.
   d. Requirements.

Hardness	ASTM D2240	75
Tensile Strength	ASTM D412	1,150 psi
Elongation	ASTM D412	800%
Adhesive Strength	ASTM D903	175 lb. l/inch
Tear Resistance	ASTM D1004	155 lb. l/ inch

F. Water:

1. All water used on project:
    a. Clean.
    b. Potable.

PART 3 - EXECUTION

3.1 GENERAL

A. Perform manhole rehabilitation after other improvements are complete.

B. Prepare surface and install liner system:

1. Per Manufacturer's recommended procedures.
2. Each manhole to be rehabilitated:
    a. Clean thoroughly.
    b. Then inspect for and repair:
        1) Loose or missing bricks.
        2) Loose mortar.
        3) Holes.
    c. Remove any protrusions or obstructions into manhole.
    d. Eliminate any observed infiltration leaks.
        1) Prior to applying manhole lining system

C. Material application:

1. Only by technicians:
    a. Factory trained.
    b. Fully qualified.

3.2 SURFACE PREPARATION

A. Clean manholes per Section 33 01 332.

1. Before and after cleaning:
    a. Visually inspect.
    b. Take digital photographs.

B. Notify Engineer immediately if:

1. Due to existing conditions, a manhole is determined not to be:
    a. Structurally sound, or
    b. Capable of coating.

C. Surface preparation work to be inspected and approved:

1. By:
    a. Engineer.
    b. Contractor.
2. Prior to installing coating.

D. Notify Engineer when manholes are ready for inspection.

1. Stop Infiltration:
    a. After surface cleaning, stop infiltration by chemical grout sealing or plugging in accordance with this Section.
2. Patching
    a. After surface cleaning, patch all holes or voids, spalled areas, and cavities caused by missing or broken brick or damaged precast concrete in accordance with this Section.
3. Remove:
    a. Completely.
    b. From inside manhole.
    c. All:
        1) Roots.
        2) Organic matter.
        3) Loose mortar and rubble of existing:
            a) Chimney (corbelling).
            b) Cone.
            c) Walls.
            d) Benches.
            e) Inverts.
    d. Remove existing manhole rungs/steps.
        1) Fill voids.
    e. Reconstruction of channels and benches
        1) Construct channels and benches of brick and concrete. The brick lined channels shall correspond in shape with the lower half of pipe.
        2) Set the top of the bench to the elevation of the crown of the highest pipe and slope 1 inch per foot to drain toward the channel.
        3) At changes in directions, lay the invert out in curves of the longest possible radii, tangent to the centerline of the sewer pipes.
        4) Construct brick surfaces exposed to surface flow with the nominal 2-inch by 8-inch face exposed (i.e. bricks on edge).
    f. Prepare all surfaces suitably:
        1) For approved coating's required bond.
        2) As recommended by Manufacturer.
    g. Allow invert and bench to cure:
        1) 30 minutes minimum.
        2) Before being subject to active flow.

3.3 INSTALLATION OF MANHOLE LINING

A. Control sewage flows per Section 33 01 33 – Temporary Bypass Pumping.

B. Ensure proper preparation and installation conditions:

1. Including:
    a. Temperature.
    b. Moisture.
2. Per ASTM F1869.
3. Apply manhole lining immediately after initial inspection.
    a. Otherwise manhole may need to be re-cleaned:
        1) Prior to lining application.
        2) To remove accumulated debris on:
            a) Benches.
            b) Walls.

C. Manhole Liner Application:

1. First Cementitious Application:
    a. Surface condition prior to spraying:
        1) Damp.
        2) Without noticeable free water.
        3) Totally saturated.
    b. Spray-apply materials.
        1) From bottom of wall to top.
        2) To a minimum uniform thickness to ensure that:
            a) All cracks, crevices, and voids are filled.
            b) A relatively smooth surface remains after light trowelling.
    c. Perform light trowelling to:
        1) Compact material into voids.
        2) Set the bond.
2. Second Cementitious Application:
    a. Apply after first application has begun to take an initial set:
        1) Disappearance of surface sheen:
            a) 15 minutes to 1 hour depending on ambient conditions.
    b. Assure a minimum total finished thickness of 1 IN.
    c. Again apply from bottom up.
    d. Finishing
        1) Finish surface with wood float, sponge float, broom or brush to produce a smooth but textured surface
3. Epoxy Liner Application:
    a. Apply Epoxy Liner in accordance with manufacturer's instructions.
    b. Apply liner as soon as possible after cementitious application.
    c. Do not allow surface contamination to the Cementitious Liner prior to Epoxy Liner application.
    d. Minimum thickness of application shall be 100 mils.

4. Curing:
    a. Minimize applied product's exposure to:
        1) Sunlight.
        2) Air movement.
    b. Set manhole cover back in place if:
        1) Second application will begin more than 15 minutes after completing first application.
        2) Finished product will be exposed to sunlight or air movement for more than 15 minutes at any time.
    c. Allow final application to cure:
        1) Before being subjected to active flow.
        2) Minimum cure time: 4 hours.
    d. Do not allow traffic over manholes:
        1) Minimum 12 hours.
        2) After application is complete.

D. Provide complete watertight seal.
    1. At connections:
        a. Pipe.
        b. Manhole wall.
    2. Submit details of how watertight connections will be made:
        a. To Engineer.
        b. For review and approval.

E. Do not install manhole lining until:
    1. All other manhole rehabilitation preparation is complete.

F. In manholes containing lines to be abandoned:
    1. Plug abandoned line with:
        a. Brick.
        b. Grout.
    2. Patch material:
        a. Minimum thickness: 6 IN.

G. Resetting manhole frames and covers:
    1. Utilize bricks and/or precast concrete grade rings, a maximum of 12-inches thick for conical tops and flat top sections, to assure frame and cover are set to existing grade.
    2. Set manhole frames in a full mortar bed. The 28-day compressive strength of the mortar shall be 4,000 psi. The mix shall provide an entrained air content by volume of 5%.
    3. Reusing existing frame and cover shall be approved by Engineer and Owner for each manhole requested.

H. Replacing manholes frames and covers:

1. Manhole frames and covers shall be per WSACC standards and specifications, as shown in the Contract Drawings.
2. Set manhole frames in a full mortar bed. The 28-day compressive strength of the mortar shall be 4,000 psi. The mix shall provide an entrained air content by volume of 5%.
3. Manholes selected for frame and cover replacement are shown in the Contract Drawings, or as directed by Engineer and Owner.

I. Frame/Chimney Seal Installation:

1. Applied Seal:
    a. Remove from area to be coated:
        1) All:
            a) Foreign material.
            b) Bituminous coating.
            c) Rust or scale build-up.
            d) Etc.
        2) By sandblasting.
        3) Per Manufacturer's requirements.
    b. Dry area completely:
        1) After cleaning.
        2) Before applying seal material.
    c. Then apply urethane resin compound:
        1) From bottom 3 inches of frame.
        2) To top 3 inches of cone.
            a) Including grade adjustment area.
        3) Minimum thickness: 120 mils.
    d. Apply per Manufacturer's written instructions.

3.4 FIELD QUALITY CONTROL

A. Inspect the work:

1. After rehabilitation and repair has been completed:
    a. Visually.
    b. In Engineer's presence.
    c. For compliance with:
        1) These specifications.
        2) Manufacturer's recommendations.
2. During warranty period.
    a. Engineer and Owner will inspect.
3. Correct:
    a. Any:
        1) Infiltration.

2) Defects in work.

b. At no additional cost to Owner.

B. Manhole Lining:

1. Test for continuity per:
   a. ASTM D4787.
   b. Approved submittals.
2. Test spray-on liners for:
   a. Holidays.
   b. Gauge depth.
3. Photograph manholes.
4. Conduct pull test with embedded bolt or tab.
5. Repair holes and discontinuities per Manufacturer's recommendations.

C. During material application:

1. Maintain daily record of:
   a. Substrate temperature.
   b. Substrate moisture content.
   c. Ambient air temperature.
   d. Humidity.
   e. Wind conditions.
2. Daily record shall be:
   a. Authenticated by Manufacturer's authorized representative.
   b. Accessible to Engineer anytime during normal project working hours.
3. Provide certified copy of daily record:
   a. To Engineer.
   b. As part of project close-out documents.

D. Defective Work:

1. Coating will be considered defective if any of the following conditions exist in final product:
   a. Dry film thickness not met.
   b. Debris embedded in:
      1) Primer, or
      2) Coating material.
   c. Loss of adhesion.
   d. Discoloration.
   e. Surface exhibits any defect identified in application section.
2. Repair all defective primer or coating:
   a. Per Manufacturer's recommendations.
   b. At no additional cost to Owner.

END OF SECTION

SECTION 01 22 00
MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. General requirements applicable to all bid/pay items.
2. General provisions on unit prices and quantities.
3. Listing of the various bid/pay items in the Project, together with criteria for measuring Unit Price Work for payment.

B. Related Requirements: Include, but are not necessarily limited to:

1. Section 01 26 00 - Contract Modification Procedures.

1.2 REQUIREMENTS APPLICABLE TO ALL BID/PAY ITEMS

A. In this Section and elsewhere in the Contract Documents, the terms “bid item”, “pay item”, “bid/pay item”, “Item” followed by a number designation, “this item”, and the like all have the same meaning, and refer to one or more specific elements of the Contract, established for pricing and payment, as indicated in the Bid Form and in the Agreement (or exhibit to the Agreement) at the time the Contract was signed by the parties.

B. This Article applies to all bid/pay items in the Contract.

C. Prices – General:

1. The bid/pay items listed starting with Article [1.5] of this Section refer to and are the same bid items listed in the Bid Form and included in the Contract and constitute all bid/pay items for the Work at the time the Contract was signed by the parties.
2. No direct or separate payment will be made, outside of the bid/pay items in the Contract, for the following: providing miscellaneous temporary or accessory materials or equipment, temporary works, temporary construction facilities, Contractor’s project management, superintendence, and similar costs for Subcontractors or Suppliers; bonds and insurance; schedules and schedule updates; coordination with: Owner’s operations (including, but not limited to, lockout/tag-out procedures), other contractors, utility owners, owners of transportation facilities, adjacent property owners and occupants, authorities having jurisdiction, Subcontractors and Suppliers, and others with whom Contractor is to coordinate the Work; information technology systems required by the Contract Documents; Submittals; photographic documentation; Project meetings; Contractor’s hazard communication program; Contractor’s compliance with environmental procedures for Constituents of Concern (including spill control and countermeasures plans and implementation); professional services (required for Contractor’s means and methods of construction, and for delegated designs required by the Contract Documents); obtaining and complying with permits and licenses; temporary utilities (including electric power, water supply and disposal, fuel, and communications); temporary lighting; temporary fire protection; temporary enclosures and HVAC; temporary sanitary facilities; temporary first-aid facilities and services; Contractor’s field offices and sheds, Engineer’s field offices (when required elsewhere in the Contract Documents); traffic control of non-construction vehicular and pedestrian traffic; temporary controls (including temporary erosion and sediment controls, noise control, control of storm water, surface water, and groundwater, pollution controls (including solid waste control, water pollution control, and control of atmospheric pollution), dust control, pest and rodent controls, odor controls, and other temporary controls required by the Contract Documents); temporary security for the Work; temporary barriers; Project signage (when required elsewhere in the Contract Documents); delivering, handling, and storing materials and equipment to be incorporated into the Work; layouts and surveys for the Work; construction equipment, machinery, tools, and vehicles;

safety and protection; Site maintenance during construction; cleaning and removal and disposal of waste and debris; checkout and startup; testing and other quality control activities required by the Contract Documents; record documents, operation and maintenance data; warranties; spare parts and extra materials required by the Contract Documents; instruction of facility personnel as required by the Contract Documents; commissioning (when required elsewhere in the Contract Documents); Contractor's correction period, Contractor's general warranty and guarantee; Contractor's indemnification obligations; other labor, cost, or effort required by the General Conditions and Supplementary Conditions, Division 01 Specifications, and other requirements of the Contract Documents.

3. Price Escalation:
    a. Unless expressly indicated otherwise in the Contract Documents, Owner is not obligated to change the stipulated prices (including lump sums, unit prices, and allowances) that are all or part of the Contract Price because of escalation of costs when there is no corresponding change in the Contract Times.
    b. Changes in the Contract Times do not necessarily entitle Contractor to a change in Contract Price due to escalation.
    c. Should Contractor claim a change in Contract Price for one or more stipulated price pay items without a corresponding change in scope, extent, or quality in the associated Work, prior to receiving any such change in Contract Price, Contractor shall submit with Contractor's associated Change Proposal, documentation satisfactory to Engineer supporting and documenting that Contractor's costs have increased because of delays beyond Contractor's control within the associated change in Contract Times included in such Change Proposal.
4. Compensation for all services, labor, materials, and equipment shall be included in prices stipulated for the unit price bid/pay items in the Contract.
5. Each unit price in the Contract shall include an amount considered by Contractor as sufficient for all overhead and profit for each separately identified bid/pay item.

D. Contract Price, Payment Procedures, and Related Matters:

1. Contract Price: The Contract Price, as apportioned among bid/pay items in the Contract, is indicated in the Agreement [and any associated exhibits thereto] and may be modified by Change Order.
2. Payments to Contractor: Refer to the General Conditions (as may be modified by the Supplementary Conditions), and the Agreement (including provisions on retainage, if any), among other applicable Contract Documents.
3. Procedures for Changes in Contract Price: Refer to the General Conditions (as may be modified by the Supplementary Conditions) and Section 01 26 00 - Contract Modification Procedures.
4. Defective Work is not eligible for payment.

1.3 GENERAL PROVISIONS ON UNIT PRICES AND QUANTITIES

A. Quantities:

1. Quantities of Unit Price Work indicated in the Bid Form and in the Contract (at the time the Agreement was signed by the parties) are estimates for purposes of pricing and comparison of Bids.
2. Owner does not represent, either expressly or by implication, or agree that the nature of materials encountered below ground surface or in concealed areas, or actual quantities of Unit Price Work required, will correspond with the quantities in the Contract at the time the Agreement was signed by the parties. Owner reserves the right to increase or decrease quantities, and to eliminate quantities, as Owner may deem necessary or as may be necessary due to Site conditions encountered.
3. Adjustment of Unit Prices Due to Variation in Quantities:

a. Provisions, if any, regarding adjustment of unit prices due to variations in actual quantities (eligible for payment) from the estimated quantities in the Contract (including quantities at the time the Agreement was signed by the parties and as subsequently modified by Change Order) are in the General Conditions, as may be modified by the Supplementary Conditions.

1) Engineer's review for possible unit price adjustment, when provision for such adjustment is expressly indicated in the Contract, will be at a time Engineer deems reasonable and proper.

2) When the Supplementary Conditions establish that, to be eligible for an adjustment in the unit price, a pay item of Unit Price Work must have a total computed, extended price (at the time the Agreement was signed by the parties) equal to or greater than a specified percentage (stipulated in the Supplementary Conditions) of the total Contract Price (at the time the Agreement was signed by the parties), and the total extended price of such pay item does not exceed the stipulated percentage of the Contract Price, then the associated pay item will be paid at the unit price in the Contract without adjustment for variations in actual quantity.

4. Quantities eligible for payment will be actual quantities furnished and installed (as applicable) in accordance with the Contract Documents, within the pay limits shown or indicated, as measured by Engineer (or other entity so empowered in the Contract Documents) and recommended for payment by Engineer.
5. At Contractor's expense, Contractor may independently verify quantities measured by Engineer for payment. Should Contractor disagree with quantities measured and recommended for payment by Engineer, submit appropriate Change Proposal (appealing Engineer's measurements) indicating the specific reasons for Contractor's appeal, with detailed reasons therefor and associated calculations and estimates, in accordance with the Contract Documents.
6. Quantity Overruns:
   a. When the quantity of a pay item of Unit Price Work eligible for payment exceeds the pay item's quantity included in the Contract, Owner will pay for quantities that exceed those in the Contract only while the estimated total payments to Contractor under the Contract will not exceed the Contract Price. Otherwise, a Change Order is required to modify the associated quantity in the Contract, thus changing the Contract Price.
7. Except as may be established elsewhere in the Contract Documents, make no claim for anticipated profit, loss of profit, damages, or additional compensation arising from difference between quantities of Unit Price Work eligible for payment and the estimated quantities in the Contract.

B. Measuring for Payment:

1. At Engineer's option, Engineer may delegate to Resident Project Representative (RPR) (if any), some or all of Engineer's responsibilities for measuring Unit Price Work eligible for payment.
2. Unless expressly indicated otherwise in the Contract Documents, measurements will be in United States standard measurements.
3. Unless indicated otherwise elsewhere in the Contract Documents, quantities of Unit Price Work eligible for payment will be rounded to the nearest whole number.
4. Assistance with Measurements:
   a. Assist Engineer and Resident Project Representative (RPR) (if any), by providing measuring equipment, labor, and survey personnel necessary to measure quantities eligible for payment.
5. Quantities eligible for payment can be adjusted by Engineer to correct quantities included in Contractor's prior payment requests, and for incomplete or defective Unit Price Work. Such corrections are at Engineer's sole discretion.

1.4 GENERAL PROVISIONS ON LUMP SUM ITEMS – (NOT USED)

1.5 BID/PAY ITEMS - GENERAL CONTRACT

A. Items 1, 7, 13, 23 – Comprehensive Manhole Rehabilitation:

1. Measurement: Measurement for Comprehensive Manhole Rehabilitation performed on existing manholes shall be a count of the number of manholes rehabilitated described in the Contract Documents and approved by the Engineer.
2. Payment: Payment of the bid price for each manhole rehabilitation shall be full compensation for all labor, equipment, and materials required for or incidental to the work, including manhole inspection and cleaning, all measures to control infiltration or repair defective areas of manhole (patching and plugging), manhole lining including manhole invert, inside drop structure removal and replacement, frame and cover removal and replacement, frame / chimney seal replacement, and site restoration.

B. Items 2, 8, 14, 19, 24 – Standard Manhole Rehabilitation:

1. Measurement: Measurement for Standard Manhole Rehabilitation performed on existing manholes shall be a count of the number of manholes rehabilitated described in the Contract Documents and approved by the Engineer.
2. Payment: Payment of the bid price for each manhole rehabilitation shall be full compensation for all labor, equipment, and materials required for or incidental to the work, including manhole inspection and cleaning, all measures to control infiltration or repair defective areas of manhole (patching and plugging), manhole lining to top of manhole bench only unless otherwise noted on the plans, inside drop structure removal and replacement, frame / chimney seal replacement, and site restoration.

C. Items 3, 9, 15 – Minor Manhole Rehabilitation:

1. Measurement: Measurement for Minor Manhole Rehabilitation performed on existing manholes shall be a count of the number of manholes rehabilitated described in the Contract Documents and approved by the Engineer.
2. Payment: Payment of the bid price for each manhole rehabilitation shall be full compensation for all labor, equipment, and materials required for or incidental to the work, including manhole inspection and cleaning, all measures to control infiltration or repair defective areas of manhole (patching and plugging), frame / chimney seal replacement, and site restoration.

D. Items 4, 10, 16, 20, 25 – Project Area Mobilization:

1. Measurement: Measurement for Project Area Mobilization performed shall be by lump sum per specific project area noted, as described in the Contract Documents and approved by the Engineer.
2. Payment: Payment of the lump sum amount shall be full compensation for the work consisting of moving personnel, equipment, and materials to each specific project area, establishing staging areas and any other temporary facilities, and all other preparatory work required to begin construction operations. Project Area Mobilization will include all mobilization required for manhole and pipe rehabilitations. No separate payment will be made for project area demobilization.

E. Items 5, 11, 17, 21, 26 – Project Area Temporary Bypass Pumping:

1. Measurement for Project Area Temporary Bypass Pumping performed shall be by lump sum per specific project area noted, as described in the Contract Documents and approved by the Engineer.
2. Payment: Payment of the lump sum amount shall be full compensation for the work consisting of furnishing, installing, operating, maintaining, and removing temporary bypass pumping systems as required to maintain continuous wastewater flow during construction. Work includes all labor, equipment, materials, controls, fuel, power, piping, monitoring, alarms, standby systems, emergency response, flow management, and all incidental work necessary to provide uninterrupted sewer service. Measures to protect the bypass pumping

system from project area flooding shall be included for bypass pumping components in operation for more than (5) five consecutive days. No separate payment will be made for downtime, pump failures, corrective work, or emergency operations. Project Area Temporary Bypass Pumping will include all bypass pumping required for manhole and pipe rehabilitations.

F. Items 6, 12, 18, 22, 27 – Project Area Site Access

1. Measurement for Project Area Site Access shall be by lump sum per specific project area noted, as described in the Contract Documents and approved by the Engineer.
2. Payment: Payment of the lump sum amount shall be full compensation for all work required to establish, maintain, and restore access routes necessary for all construction activities. This work shall include, but is not limited to, clearing, grubbing, incidental minor grading, traffic control, temporary entrances, providing and maintaining drivable surfaces suitable for project vehicles, coordination with property owners for right-of-entries, temporary drainage / stream crossings, matting, stone surfaces, or geotextiles, repair of damage to public or private property caused by construction access, and restoration of access routes to equal or better condition after use. Project Area Site Access will include all site access required for manhole and pipe rehabilitations.

G. Item 28 – Additional Frame and Cover Replacement:

1. Measurement: Measurement for Additional Frame and Cover Replacement performed on existing manholes shall be a count of the number of frames and covers replaced not previously described in the Contract Documents within the manhole rehabilitation categories and approved by the Engineer.
2. Payment: Payment of the bid price for each manhole frame and cover replacement shall be full compensation for all labor, equipment, and materials required for or incidental to the work, including removal of existing frames and covers, installation of new manhole frames and covers, and site restoration.

H. Item 29 – Additional Frame and Seal Replacement:

1. Measurement: Measurement for Additional Frame and Seal Replacement performed on existing manholes shall be a count of the number of frames and seals replaced not previously described in the Contract Documents within the manhole rehabilitation categories and approved by the Engineer.
2. Payment: Payment of the bid price for each manhole frame and seal replacement shall be full compensation for all labor, equipment, and materials required for or incidental to the work, including resetting of existing frames and covers, seal replacement and site restoration.

I. Item 30 – Additional Manhole Lining:

1. Measurement: Measurement for Additional Manhole Lining performed on existing manholes shall be on a vertical foot basis made from the top of the manhole rim to the lowest pipe invert for manholes rehabilitated not previously described in the Contract Documents within the manhole rehabilitation categories and approved by the Engineer.
2. Payment: Payment of the bid price for each vertical foot shall be full compensation for lining of each manhole, including furnishing and mixing chemicals, injecting grout sealant, invert sealing, grout patching and plugging, manhole lining, and furnishing of all labor, tools, equipment and materials required for or incidental to the work.

J. Item 31 – Additional Pipe Connection Grouting:

1. Measurement: Measurement for Additional Pipe Connection Grouting performed on existing manholes shall be a count of the number of pipe connections grouted not previously described in the Contract Documents within the manhole rehabilitation categories and approved by the Engineer.

2. Payment: Payment of the bid price for each pipe connection grouting including furnishing and mixing chemicals, injecting grout sealant, grout patching or plugging, and furnishing of all labor, tools, equipment and materials required for or incidental to the work.

K. Item 32 – Additional Manhole Wall Grouting:

1. Measurement: Measurement for Additional Manhole Wall Grouting performed on existing manholes shall be per gallon of grout required for manholes rehabilitated not previously described in the Contract Documents within the manhole rehabilitation categories and approved by the Engineer.
2. Payment: Payment of the bid price for each manhole wall grouting shall be full compensation for manhole wall grouting including furnishing and mixing chemicals, injecting grout sealant, grout patching or plugging, and furnishing of all labor, tools, equipment and materials required for or incidental to the work.

L. Item 33 – Additional Manhole Bench Rehabilitation:

1. Measurement: Measurement for Additional Manhole Bench Rehabilitation performed on existing manholes shall be a count of the number of manhole benches rehabilitated not previously described in the Contract Documents within the manhole rehabilitation categories and approved by the Engineer.
2. Payment: Payment of the bid price for each manhole bench rehabilitation shall be full compensation for manhole bench rehabilitation including furnishing of all labor, tools, equipment and materials required for or incidental to the work.

M. Item 34 – Additional Manhole Vent Pipe Replacement:

1. Measurement: Measurement for Additional Manhole Vent Pipe Replacement performed on existing manholes shall be a count of the number of manhole vent pipes replaced not previously described in the Contract Documents within the manhole rehabilitation categories and approved by the Engineer.
2. Payment: Payment of the bid price for each manhole vent pipe replacement shall be full compensation for manhole vent pipe replacement including furnishing of all labor, tools, equipment and materials required for or incidental to the work.

N. Item 35 – Epoxy Manhole Lining:

1. Measurement: Measurement for Additional Manhole Epoxy Lining performed on existing manholes shall be on a vertical foot basis made from the top of the manhole rim to the lowest pipe invert for manholes rehabilitated not previously described in the Contract Documents within the manhole rehabilitation categories and approved by the Engineer.
2. Payment: Payment of the bid price for each vertical foot shall be full compensation for epoxy lining of each manhole post cementitious manhole lining applications, testing, and furnishing of all labor, tools, equipment and materials required for or incidental to the work.

O. Items 36, 38, 39, 40, 42, 45 – Cured In Place Pipe Patching:

1. Measurement: Measurement for Cured In Place Pipe Patching shall be on a linear foot basis and shall be along the ground surface above and parallel to the pipeline. Cleaning and inspection of the sewer segments within the project area before and after pipe lining shall be included as part of the pipe patching cost.
2. Payment: Payment of the bid price for mainline pipe patching shall be full compensation for cleaning, inspections, and all labor, equipment, and materials required for or incidental to the work.

P. Items 37, 41, 43, 47, 48, 50, 51 – Cured In Place Pipe Lining:

1. Measurement: Measurement for Cured In Place Pipe Lining shall be on a linear foot basis and shall be along the ground surface above and parallel to the pipeline from and to the inside face of structures. No deductions will be made for the length of fittings. Cleaning and inspection of the sewer segments within the project area before and after pipe lining shall be included as part of the pipe lining cost.

2. Payment: Payment of the bid price for mainline pipe lining shall be full compensation for cleaning, providing and testing of the lining, inspections, and all labor, equipment, and materials required for or incidental to the work.

Q. Items 44, 46, 49 – Pipe Cleaning and CCTV Inspection:

1. Measurement: Measurement for Pipe Cleaning and CCTV Inspection shall be on a linear foot basis and shall be along the ground surface above and parallel to the pipeline from and to the inside face of structures.
2. Payment: Payment of the bid price for mainline pipe cleaning and inspection shall be full compensation for any required preparatory light or heavy cleaning of the mainline, inspection, and video recording of the pipelines, and all labor, equipment and materials required for or incidental to the work.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION - (NOT USED)

END OF SECTION