

February 5, 2021

TOWN OF CARMEL

PUTNAM COUNTY, NEW YORK

CARMEL WATER DISTRICT NO. 2 WATER MAIN LINING PROJECT

CONTRACT C265

ADDENDUM No. 4

TO ALL PROSPECTIVE BIDDERS:

This addendum is issued this day in conformance with Article 7 of the Instruction to Bidders, included in the Contract Documents. The information contained in this addendum is intended to clarify, supersede, replace, or supplement the Contract Documents as specified herewith, and shall be made an integral part of the Contract. This Addendum must be attached to each bidders Contract Documents and submitted along with his bid. This addendum has been prepared to modify information contained in the Contract Documents.

Town of Carmel
Carmel Water District No. 2 Water Main Lining Project
Contract C265
Contact Person: John E. Folchetti, P.E.

1. Contract Document Modifications

Prospective bidders are advised that the following shall be removed from the Contract Document Bid set and replaced with the attached documents:

- **Bid Form**
- **Section 1C Measurement and Payment**
- **Section 15B4 Cleaning and Lining Watermains**
- **Section 15B5 Temporary Water Mains**
- **Sheet 6R Everett Road Complex Lining Phase 2 St. Michaels Terrace**

2. Prospective Bidders are advised that the time for submittal of questions has been extended to 12:00 PM on Monday February 8, 2021.

**Bid Form
and Forms to Accompany Bid**

(THIS BID FORM SHALL NOT BE DETACHED FROM THE PROJECT MANUAL. THE ENTIRE PROJECT MANUAL SHALL BE RETURNED WITH THE EXECUTED BID).

BID FORM

BID FOR:

The Town of Carmel, Putnam County, New York
Carmel Water District No. 2 Water Main Lining Project
Contract C265

BID TO:

Town of Carmel
60 McAlpin Avenue
Mahopac, New York 10541

BID FROM: _____

(Print or Type Name of Bidder)
(/A Corporation/A Partnership/An Individual/A Joint Venture/
[Bidder to strike out inapplicable terms.]

Gentlemen:

The undersigned Bidder offers and agrees, if this Bid is accepted, to enter into an Agreement with OWNER in the form included in the Contract Documents to complete all Work as specified or indicated in the Contract Documents for the Contract Price and within the Contract Time indicated in this Bid and in accordance with the Contract Documents.

Bidder declares that no person or persons other than those named herein are interested in this Bid; that this Bid is made without collusion with any other person, firm or corporation; and that no person or persons acting in any official capacity for the OWNER are directly or indirectly interested in this Bid, or in any portion of the profit thereof.

In submitting this Bid, Bidder represents, as more fully set forth in the Agreement, that he has examined the Instructions to Bidders, all of the other Bidding Documents and all of the Contract Documents; that he has examined the actual site and locality where the Work is to be performed; that he has familiarized himself with the legal requirements (federal, state and local laws, ordinances, rules and regulations); that he has made such independent investigations as he deems necessary; and that he has satisfied himself as to all conditions affecting cost, progress or performance of the Work.

Bidder further agrees as follows: 1) that this Bid shall remain open and may not be withdrawn for the time period set forth in the Instructions to Bidders (Instructions); 2) that Bidder accepts

all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of bid security; and that, 3) upon acceptance of this Bid, Bidder will execute the Agreement and will furnish the required contract securities and insurance certificates within the time period(s) set forth in the Instructions to Bidders, which Instructions are incorporated herein by reference for full meaning and import.

The approximate quantities of Work to be performed under the proposed Agreement are set forth in the Bid Form. These quantities are to be considered as approximate only and are given solely for the comparison of Bids. The OWNER does not expressly or by implication agree that the actual amounts will correspond therewith, but reserves the right to increase or decrease the amount of any item or portion of the Work as may be deemed necessary by the ENGINEER. The CONTRACTOR shall at no time make claim for anticipated profit or loss of profits because of any difference between the quantities of Work actually done, or of material actually furnished, and the estimated quantities. The CONTRACTOR will be paid only for the actual quantities of Work performed at the Contract bid prices.

AMOUNTS TO BE SHOWN IN BOTH WORDS AND NUMERALS. IN CASE OF DISCREPANCY, AMOUNTS SHOWN IN WORDS WILL GOVERN.

In accordance with the above understandings and agreements, Bidder will complete the Work for the following sums:

PAYMENT ITEM NO.	PAYMENT ITEM DESCRIPTION & UNIT PRICE (IN WORDS)	ESTIMATED QUANTITY UNIT	UNIT PRICE (IN FIGURES)	TOTAL AMOUNT
1A	CEMENTITIOUS LINING			
1A1	6" DIA. CEMENTITIOUS LINING DOLLARS AND CENTS	11,000 LF		
1A2	8" DIA. CEMENTITIOUS LINING DOLLARS AND CENTS	10,700 LF		
1A3	8" DIA. CEMENTITIOUS LINING FROM EVERETT TANK TO OLD ROUTE 6 DOLLARS AND CENTS	2,100 LF		
1B	BURIED PIPING			
1B1	6" DR 14 PVC WATERMAIN DOLLARS AND CENTS	700 LF		
1B2	8" DR 14 PVC WATERMAIN DOLLARS AND CENTS	1000 LF		
1B3	12" HDPE STORMWATER PIPE DOLLARS AND CENTS	200 LF		
1B4	15" HDPE STORMWATER PIPE DOLLARS AND CENTS	200 LF		
1C	VALVES AND FITTINGS			
1C1	6" GATE VALVE PRE-LINING INSTALLATION DOLLARS AND CENTS	16 EA		
1C2	8" GATE VALVE PRE-LINING INSTALLATION DOLLARS AND CENTS	12 EA		
1C3	6" GATE VALVE POST-LINING INSTALLATION DOLLARS AND CENTS	10 EA		

PAYMENT ITEM NO.	PAYMENT ITEM DESCRIPTION & UNIT PRICE (IN WORDS)	ESTIMATED QUANTITY UNIT	UNIT PRICE (IN FIGURES)	TOTAL AMOUNT
1C4	8" GATE VALVE POST-LINING INSTALLATION DOLLARS AND CENTS	10 EA		
1C5	6" BENDS DOLLARS AND CENTS	24 EA		
1C6	8" BENDS DOLLARS AND CENTS	24 EA		
1C7	3/4" CURB STOP REPLACEMENT DOLLARS AND CENTS	40 EA		
1D	TEMPORARY WATER SUPPLY			
1D1	TEMPORARY 4" DIA. WATERMAIN DOLLARS AND CENTS	49,000 LF		
1D2	TEMPORARY 3/4" DIA. WATER SERVICE DOLLARS AND CENTS	280 EA		
1E	PIPE CLEANING DOLLARS AND CENTS	24,000 LF		
1F1	PRE-LINING CCTV PIPELINE INSPECTION DOLLARS AND CENTS	24,000 LF		
1F2	POST-LINING CCTV PIPELINE INSPECTION DOLLARS AND CENTS	24,000 LF		
2	LOCATION OF EXISTING UTILITIES DOLLARS AND CENTS	LS		
3	TEST PITS DOLLARS AND CENTS	75 EA		

TOWN OF CARMEL
 CARMEL WATER DISTRICT NO. 2
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PAYMENT ITEM NO.	PAYMENT ITEM DESCRIPTION & UNIT PRICE (IN WORDS)	ESTIMATED QUANTITY UNIT	UNIT PRICE (IN FIGURES)	TOTAL AMOUNT
4	CAST-IN-PLACE CONCRETE			
4A	CLASS "B" CONCRETE DOLLARS AND CENTS	100 CY		
4B	CONCRETE SIDEWALKS DOLLARS AND CENTS	50 SF		
4C	CONCRETE CURBS DOLLARS AND CENTS	100 LF		
4D	K-CRETE BACKFILL DOLLARS AND CENTS	50 CY		
5	ASPHALT PAVEMENT			
5A	4" ASPHALT BINDER COURSE DOLLARS AND CENTS	500 SY		
5B	2" ASPHALT TOP COURSE DOLLARS AND CENTS	500 SY		
5C	ASPHALT CONCRETE CURB DOLLARS AND CENTS	500 LF		
6	MAINTENANCE AND PROTECTION OF TRAFFIC DOLLARS AND CENTS	L.S.		
7	INSTALLATION AND MAINTENANCE OF TEMPORARY EROSION AND SEDIMENT CONTROL PRACTICES DOLLARS AND CENTS	LS		
8	VEGETATED SURFACE RESTORATION DOLLARS AND CENTS	50 SY		

TOWN OF CARMEL
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PAYMENT ITEM NO.	PAYMENT ITEM DESCRIPTION & UNIT PRICE (IN WORDS)	ESTIMATED QUANTITY UNIT	UNIT PRICE (IN FIGURES)	TOTAL AMOUNT
	EXTRA ITEMS			
9	EXTRA EARTH EXCAVATION DOLLARS AND _____ CENTS	50 CY		
10	EXTRA FOUNDATION STONE DOLLARS AND _____ CENTS	100 CY		
11	EXTRA SELECT BACKFILL DOLLARS AND _____ CENTS	100 CY		
12	EXTRA TRACKING PAD DOLLARS AND _____ CENTS	100 SY		
	BASE BID TOTAL			
	ALTERNATE			
13	8" FLEXIBLE MULTI-LAYER PRESSURE LINER FROM EVERETT TANK TO OLD ROUTE 6 DOLLARS AND _____ CENTS	2100 LF		
	TOTAL AMOUNT BID			

The following listed documents are to be submitted with and made a condition of this Bid.

- *A. Bid Security.
- *B. Certificate of Surety.
- *C. Certified Copy of Resolution of Board of Directors (if corporation).
- *D. Bidder's Qualification Statement.
- *E. Non-Collusive Bidding Certification.
- *F. Certificate Pursuant to New York State General Municipal Law § 103-g.
- *G. Certification By Bidder Regarding Equal Employment Opportunity.
- *H. Certification of Nonsegregated Facilities.
- *I. Site Visitation Statement.

*Forms included in Project Manual

Communications concerning this Bid shall be addressed to the Bidder at the following address:

The terms used in this Bid, which are defined in the General and Supplementary Conditions, have the meanings assigned to them in the General and Supplementary Conditions.

Respectfully submitted on _____, 20__.

If BIDDER is:

An Individual

By _____
(Individual's Signature)

(Printed or Typed Name of Individual)

Doing business as _____

Business Address: _____

Phone No: _____

A Partnership

By _____
(Firm's Name)

(Partner's Signature)

(Printed or Typed Name of Partner)

Business Address: _____

Phone No: _____

A Corporation

By _____
(Corporation's Name)

(State of Incorporation)

By _____
(Signature of Officer Authorized to Sign)

(Printed or Typed Name and Title of Officer Authorized to Sign)

(CORPORATE SEAL)

Attest _____
(Secretary)

Business Address: _____

Phone No: _____

A Limited Liability Company

By _____
(Limited Liability Company's Name)

(State of Limited Liability Company)

By _____
(Signature of Officer Authorized to Sign)

(Printed or Typed Name and Title of Officer Authorized to Sign)

(LIMITED LIABILITY COMPANY SEAL)

Attest _____
(Secretary)

Business Address: _____

Phone No: _____

A Limited Liability Partnership

By _____
(Limited Liability Partnership's Name)

(State of Limited Liability Partnership)

By _____
(Signature of Officer Authorized to Sign)

(Printed or Typed Name and Title of Officer Authorized to Sign)

(LIMITED LIABILITY PARTNERSHIP SEAL)

Attest _____
(Secretary)

Business Address: _____

Phone No: _____

A Joint Venture

By _____
(Signature)

(Printed or Typed Name)

(Address)

By _____
(Signature)

(Printed or Typed Name)

(Address)

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

++END OF SECTION++

SECTION 1C

MEASUREMENT AND PAYMENT

1.1 DESCRIPTION

- A. The items listed below beginning with Article 1.4, refer to and are the same pay items listed in the Bid Form. They constitute all of the pay items for the completion of the Work. No direct or separate payment will be made for providing: miscellaneous temporary or accessory work, service, CONTRACTOR's or ENGINEER's field offices, layout surveys, job signs, testing, safety devices, approval and record drawings, water supplies, power, heat, removal of waste, watchmen, taxes, bonds, insurance, mobilization and demobilization, photographs, and all other requirements of the General Conditions, Supplementary Conditions, General Requirements, and all other sections of the Project Manual. Compensation for all such services, things and materials shall be included in the prices stipulated for the lump sum and unit price pay items listed herein.
- B. Each lump sum and unit bid price will be deemed to include an amount considered by the CONTRACTOR to be adequate to cover CONTRACTOR's overhead and profit for each separately identified item.
- C. Where a payment item number has different types of materials or work included, the item number will be followed by a letter. The payment item number may be further defined by adding a number after the letter to indicate a particular work category such as depth or size of materials.

1.2 ENGINEER'S ESTIMATE OF QUANTITIES

- A. The ENGINEER's estimated quantities for unit bid prices, as listed in the Bid Form are approximate only and are included solely for the purpose of comparison of Bids. The OWNER does not expressly or by implication agree that the nature of the materials encountered below the surface of the ground or the actual quantities of material encountered or required will correspond therewith, and reserves the right to increase or decrease any quantity or to eliminate any quantity as deemed necessary. The CONTRACTOR will not be entitled to any adjustment in a unit bid price as a result of any elimination or any change in an estimated quantity and agrees to accept the aforesaid unit bid prices as complete and total compensation for any additions or deductions as a result of more accurate measurement, changes or alteration in the Work ordered by the OWNER, or any other reason, and for use in the computation of the value of the Work performed for progress payment.

1.3 RELATED PROVISIONS SPECIFIED ELSEWHERE

- A. Payments to CONTRACTOR: Refer to the General Conditions, Supplementary Conditions and the Contract Agreement.
- B. Changes in Contract Price: Refer to the General Conditions.
- C. All sections of the Contract Manual.

1.4 WATERMAIN LINING PROJECT - CONTRACT C265

- A. Payment Item 1A – Cementitious Lining:
 - 1. Work Included. Payment Item 1A includes all subdivisions of Item 1A shown on the Bid Form including Items 1A1 through 1A3. Item 1A shall include all the requirements for furnishing and installing all cementitious lining, all cleaning and disinfection, proper disposal of highly chlorinated water, service lateral restoration, other necessary appurtenances, excavation and backfill, temporary pavement restoration, labor, materials and equipment necessary to install liner as specified and as contained in the following divisions and sections of the Contract Documents:
 - a. Division 1, General Requirements, all Sections except the following:
1G13, Maintenance and Protection of Traffic
 - b. Division 2, Sitework, all Sections except the following:
2I2, Restoration of Paved Surfaces
2K, Vegetative Surface Restoration
2P, Environmental Protection and Erosion and Sediment Control
 - c. Division 15, Piping:
All Division 15 piping work required for furnishing and installing cementitious lining not specifically included under other payment items of this Contract.
 - d. In addition to the criteria defined above in paragraphs 1 and 1a-d, Payment Item 1A3 shall include all clearing, grubbing, chipping, removal, storage and and replacement of chain link fencing, access road construction, access road removal, erosion and sediment control, vegetative surface restoration, timber disposal, and all other equipment, labor, materials and appurtenances necessary to install Payment Item 1A3 as shown and specified.
 - 2. Measurement:
 - a. The quantity of cementitious lining which will be included under Item 1A will be the actual number of linear feet of cementitious lining furnished and installed.
 - b. The lengths of cementitious lining indicated by the stationing shown on the Drawings are approximate. The CONTRACTOR shall provide the lengths of pipe necessary to make the required

- connections at the inverts shown.
 - c. The length shall be measured along the horizontal projection of the centerline of the pipe as installed from the point of beginning to the point of ending.
 - 3. Payment: The unit prices contained in the Bid for Item 1A will be full compensation for furnishing and installing all cementitious lining complete as shown and specified and not specifically included for payment under other items.
- B. Payment Item 1B - Buried Piping:
 - 1. Work Included. Payment Item 1B includes all subdivisions of Item 1B shown on the Bid Form including Items 1B1 through 1B4. Item 1B shall include all the requirements for furnishing, installing, and backfilling all buried piping, fittings, valves and appurtenances, and for abandonment, removal, and disposal of existing system components contained in the following divisions and sections of the Contract Documents.
 - a. Division 1, General Requirements, all Sections except the following:
 - 1G13, Maintenance and Protection of Traffic
 - b. Division 2, Site Work required for the installation of buried piping, including the following:
 - Section 2B, Clearing
 - Section 2C, Abandonments, Demolitions and Removal
 - Section 2D1, Excavation, Trenching and Backfill
 - c. Division 3, Concrete:
 - All Division 3 Concrete work required for the installation of buried piping not specifically included in other Payment Items of this Contract.
 - d. Division 15, Piping:
 - All Division 15 piping work required for furnishing and installing buried piping not specifically included under other payment items of this Contract.
 - 2. Measurement:
 - a. The quantity of underground piping which will be included under Item 1B will be the actual number of linear feet of buried piping furnished and installed.
 - b. The lengths of pipe indicated by the stationing shown on the Drawings are approximate. The CONTRACTOR shall provide the lengths of pipe necessary to make the required connections at the penetrations made for all lining work as shown.
 - c. The length shall be measured along the horizontal projection of the centerline of the pipe as installed from the point of beginning to the point of ending.
 - 3. Payment: The unit prices contained in the Bid for Item 1B will be full compensation for furnishing and installing all Buried Piping, and appurtenances, complete as shown and specified and not specifically

included for payment under other items.

C. Payment Item 1C - Valves and Fittings:

1. Work Included. Payment Item 1C includes all subdivisions of Item 1C shown on the Bid Form including Items 1C1 through 1C6. Item 1C shall include all the requirements for furnishing, installing, and backfilling all buried valves, fittings, and appurtenances, and for abandonment, removal, and disposal of existing system components contained in the following divisions and sections of the Contract Documents.
 - a. Division 1, General Requirements, all Sections except the following:
1G13, Maintenance and Protection of Traffic
 - b. Division 2, Site Work required for the installation of buried piping, including the following:
Section 2B, Clearing
Section 2C, Abandonments, Demolitions and Removal
Section 2D1, Excavation, Trenching and Backfill
 - c. Division 3, Concrete:
All Division 3 Concrete work required for the installation of buried piping not specifically included in other Payment Items of this Contract.
 - d. Division 15, Piping: All Division 15 piping work required for furnishing and installing valves, fittings, and appurtenances not specifically included under other payment items of this Contract.
2. Payment: The unit prices contained in the Bid for Item 1C will be full compensation for furnishing and installing all valves, fittings and appurtenances, complete as shown and specified and not specifically included for payment under other items.

D. Payment Item 1C7 – ¾" Curbstop Replacement

1. Work Included: Payment Item 1C7 includes all Work necessary to install curb valves and curb boxes as shown and specified. Item 1C7 shall include all the requirements for furnishing, excavating, installing, and backfilling all curb valves and curb boxes contained in the following divisions and sections of the Contract Documents.
 - a. Division 1, General Requirements, all Sections except the following:
1G13, Maintenance and Protection of Traffic
 - b. Division 2, Site Work required for the installation of buried piping, including the following:
Section 2C, Abandonment, Demolition and Removal
Section 2D1, Excavation, Trenching and Backfill
 - c. Division 15, Piping:
All Division 15 piping work required for furnishing and installing curb valves and curb boxes not specifically included under other payment items.

2. Payment: The unit prices contained in the Bid for Item 1C7 will be full compensation for furnishing and installing all curb valves, curb boxes, and associated piping, complete as shown and specified and not specifically included for payment under other items.
- E. Payment Item 1D - Temporary Water Supply:
1. Work Included: Payment Item 1D includes all subdivisions of Item 1D shown on the Bid Form including Items 1D1 through 1D2. Item 1D shall include all the requirements for furnishing and installing all temporary piping, fittings, valves, connections, and appurtenances to provide temporary potable water service as contained in the following divisions and sections of the Contract Documents.
 - a. Division 1, General Requirements, all Sections except the following:
1G13, Maintenance and Protection of Traffic
 - b. Division 2, Site Work required for the installation of temporary piping, including the following:
Section 2B, Clearing
Section 2C, Abandonments, Demolitions and Removal
Section 2D1, Excavation, Trenching and Backfill
 - c. Division 3, Concrete:
All Division 3 Concrete work required for the installation of temporary water supply not specifically included in other Payment Items of this Contract.
 - d. Division 15, Piping:
All Division 15 piping work required for furnishing and installing temporary water service piping not specifically included under other payment items of this Contract.
 2. Measurement:
 - a. The quantity of temporary piping will be included under Item 1D will be the actual number of linear feet of water service piping furnished and installed.
 - b. Payment Item 1D1 - Temporary 4" Dia. water main shall include furnishing and installing 4" Dia. temporary water pipe and shall include all pipe and fittings, temporary hydrants, excavation, connections to existing water mains, valves at each connection to existing water mains, above ground piping installation with restrained joints, blocking and thrust blocks to prevent movement, disinfection, maintenance of water service, removal of system at completion and all other work required to provide a complete above ground water service system where shown on the Contract Drawings or where ordered to be installed by the ENGINEER. Temporary water service system not to be installed when freezing temperatures are anticipated.
 - c. Payment Item 1D2 - Temporary 3/4" Dia. water service shall include all work to install temporary water service pipe, including

the temporary tap connection to the temporary watermain, connection to the building either at the hose bib or inside as required, any excavation and transition fittings required to connect to existing water service pipes, disinfecting, maintenance of water service, removal of system at completion, and all other work required to provide temporary water service where shown on the Contract Drawings or where ordered to be installed by the ENGINEER.

3. Payment: The unit prices contained in the Bid for Item 1D will be full compensation for furnishing and installing all Temporary Water Supply, and appurtenances, complete as shown and specified and not specifically included for payment under other items.

F. Payment Item 1E - Pipe Cleaning:

1. Work Included: Item 1E shall include all the requirements for cleaning pipes.
2. Measurement:
 - a. The quantity of pipe cleaning that will be included under Item 1E will be the actual number of linear feet of water service piping cleaned.
3. Payment: The unit prices contained in the Bid for Item 1E will be full compensation for pipe cleaning as shown and specified and not specifically included for payment under other items.

G. Payment Item 1F1 - Pre-Lining CCTV Pipeline Inspection:

1. Work Included. Payment Item 1F1 shall include all the requirements for televising and reporting on the condition of water mains before lining as shown and specified.
2. Measurement: Pre-Lining CCTV Pipeline Inspection shall be measured in actual linear feet of satisfactory visual inspection completed and reported on as shown and specified. CCTV pre-lining inspection shall be measured along the length of the centerline of the inspected sanitary sewer.
3. Payment: The unit price bid for Item 1F1 will be full compensation for providing closed circuit TV inspection pre-lining inspection reports on the results thereof.

H. Payment Item 1F2 - Post-Lining CCTV Pipeline Inspection:

1. Work Included. Payment Item 1F2 shall include all the requirements for televising and reporting on the condition of water mains after lining as shown and specified.
2. Measurement: Post-Lining CCTV Pipeline Inspection shall be measured in actual linear feet of satisfactory visual inspection completed and reported on as shown and specified. CCTV post-lining inspection shall be measured along the length of the centerline of the inspected sanitary sewer.

3. Payment: The unit price bid for Item 1F2 will be full compensation for providing closed circuit TV inspection post-lining inspection reports on the results thereof.
- I. Payment Item 2 - Location of Existing Utilities
1. Work Included: Payment Item 2 shall include for payment all labor, materials, tools, and equipment necessary to locate water mains, sewer mains, and service connections as shown and specified in accordance with Sections 1A2 and 15A1.
 - a. The CONTRACTOR is responsible for locating the existing potable water mains and sewer service lines in the Contract Area. The CONTRACTOR shall coordinate mark-out activities with the Town. Use state-of-the-art technology subsurface detection equipment, as necessary, to locate existing underground potable watermains and services. Location of existing water services shall include the locating of the existing curb stop valve and box.
 - b. CONTRACTOR shall maintain watermain mark-out locations for the duration of the Contract. Location of existing watermains and services shall be accurately indicated on the Contract As-Built Drawings.
 2. Payment: The lump sum price bid for Payment Item 2, Location of Existing Utilities will be full compensation for all labor, tools, materials and equipment used in locating all water and sewer utilities in the Contract Work area.
- J. Payment Item 3: Test Pits
1. Work Included: Payment Item 3 shall include for payment all labor, materials, tools and equipment necessary to excavate, backfill and restore test pits as shown and specified in accordance with all regulatory rules and permits.
 2. Payments: The prices bid for test pits will be full compensation for all labor, tools, materials and equipment used for excavating, backfilling and restoring test pits as shown or as ordered by ENGINEER.
- K. Payment Item 4 - Cast-In-Place Concrete:
1. Work Included: Payment Item 4 includes all subdivisions of Item 4 shown on the Bid Form including Items 4A through 4D.
 - a. Payment Item 4A - Class "B" Concrete
 1. Measurement: The quantity of Class "B" concrete, which will be included under this item, will be the volume of Class "B" concrete in cubic yards actually furnished and placed as shown and specified in the Contract Documents, and which is ordered by the ENGINEER in writing. Payment Item 4A shall also include all labor, materials and equipment to replace unreinforced masonry retaining and decorative walls. Class "B" concrete will be measured for

payment on the basis of lines and grades ordered or as the volume in place between the limits ordered by the ENGINEER. Class "B" shall meet the requirements of Section 3B.

2. Payment: The unit price bid per cubic yard for Item 4A will be full compensation for providing all Class "B" concrete complete as shown and specified in the Contract Documents, and not specifically included for payment under other items.

b. Payment Item 4B: Concrete Sidewalks

1. Work Included: Payment Item 4B shall include for payment all labor, materials, equipment, tools and incidentals required to furnish and install all cement concrete pavement, metal reinforcement and longitudinal joint ties as shown and specified and in accordance with Section 3B, except where specifically included under other items of this Contract.

a. This item shall include but not be limited to the following:

- 1) Excavation and removal of existing sidewalks including subbase material, or temporary asphalt concrete material. Include cost to sawcut existing material to produce neat, square patching. Existing material to be disposed of offsite.
- 2) Grading and compaction preparation of subbase surface.
- 3) Drilling and grouting longitudinal joint ties.
- 4) Furnishing and installing metal reinforcement.
- 5) Forming, placing, vibrating, and curing concrete.
- 6) Testing.
- 7) Installation and removal of steel protection plates.

2. Measurement of in-place quantities shall be made by the ENGINEER. The CONTRACTOR may, at his own expense, verify the quantities.

a. The length of the sidewalk replacement section shall be measured along the horizontal projection of the center line of the installed sidewalk.

b. The width of the section shall be in accordance with the dimensions shown on the Contract Drawings. No additional payment shall be made for concrete

sidewalk, which is necessary to be performed, due to disturbance by the CONTRACTOR, but which is outside the payment dimensions indicated by the Contract Documents.

3. Payments: The unit price contained in the Bid per square foot will be full compensation for furnishing and installing all concrete sidewalks complete as shown and specified.

c. Payment Item 4C: Concrete Curbs

1. Work Included: This Item shall include for payment all labor, equipment, materials, tools and incidentals required to furnish and install all concrete curbs as shown and specified in accordance with the Contract Documents.

a. This Item shall include but not be limited to the following:

- 1) Demolition, excavation and removal of existing concrete curbing, including any saw cutting as necessary.
- 2) Grading and compaction preparation of subbase surface.
- 3) Rebar.
- 4) Form, place, finish, and cure concrete.
- 5) Testing.

2. Measurement of in-place quantities shall be made by the ENGINEER. The CONTRACTOR may at his own expense verify the quantities.

a. The width and height of the concrete curbs shall be in accordance with the dimensions shown on the Contract Drawings.

b. The length of the curb replacement section shall be measured along the horizontal projection of the center line of the curb.

3. Payments: The unit price contained in the Bid per linear foot will be full compensation for furnishing and installing all concrete curbs complete as shown and specified.

d. Payment Item 4D - K-Crete Backfill:

1. Measurement: The quantity of K-Crete concrete backfill, which will be included under Item 4D, will be the volume of K-Crete in cubic yards actually furnished and placed as shown in the Contract Drawings and Contract Specifications. No K-Crete placed in structures or elsewhere, which is paid for under other items, will be paid for under this Item.

2. Payment: The unit price bid per cubic yard for Item 4D will be full compensation for providing all K-Crete backfill

complete as ordered by the ENGINEER, and not specifically included for payment under other items.

L. Payment Item 5: Asphalt Pavement

1. Work included: Payment Item 5 includes all subdivisions of Item 5 shown on the Bid Form including Items 5A through 5C. Payment Item 5 shall include for payment all labor, materials, tools and incidentals required to furnish and install all hot mix asphalt concrete pavement and curbing as shown and specified and in accordance with Section 2I2, except where specifically included under other items of this Contract.
 - a. This item shall include but not be limited to the following:
 - 1) Excavation and removal of temporary pavement including K-Crete, subbase material, or temporary asphalt concrete material. Include cost to sawcut existing pavement to produce neat, square patching. Temporary asphalt concrete material to be disposed of offsite. Subbase material to be stockpiled at a location designated by the OWNER, or if the OWNER requests, disposed of offsite.
 - 2) Grading and compaction preparation of subbase surface.
 - 3) Placing and compaction binder and surface courses of hot mix, hot laid bituminous pavement.
 - 4) Forming and installation of hot mix, and hot laid asphalt curb.
 - 5) Pavement marking, as necessary, to replace the existing pavement markings.
 - 6) Testing.
2. Measurement of in-place quantities shall be made by the ENGINEER. The CONTRACTOR may, at his own expense, verify the quantities.
 - a. The length of the pavement replacement section shall be measured along the horizontal projection of the center line of the pipeline trench.
 - b. The width of the paved section shall be in accordance with the dimensions shown on the Contract Drawings. No additional payment shall be made for asphalt concrete pavement restoration, which is necessary to be performed, due to disturbance by the CONTRACTOR, but which is outside the payment dimensions indicated by the Contract Documents.
 - c. The length of the asphalt curb replacement shall be measured along the actual length of the asphalt curb installed.
3. Payment: The unit price contained in the Bid per square yard for asphalt concrete pavement will be full compensation for furnishing and installing all hot mix, hot laid asphalt concrete pavement, complete and as shown and specified and not specifically included under other items. The unit price contained in the Bid, per linear foot, will be full compensation for furnishing and installing all the asphalt curb.

- M. **Payment 6: Maintenance and Protection of Traffic**
1. **Work Included:** This item shall include for payment all labor, materials, tools and equipment necessary for the safe and adequate maintenance and protection of traffic, except those specifically included under other items of this Contract.
 - a. This item shall include furnishing, placing, moving and removing signs, barricades, lighting, drums, cones, temporary culverts and approaches, road plates, watchmen, traffic control men, temporary pavement markings, and temporary control devices as necessary.
 2. **Payment:**
 - a. The lump sum price Bid for maintenance and protection of traffic will be full compensation for furnishing, placing, moving and removing all maintenance and protection of traffic devices, in accordance with Specification Section 1G13 of this Contract and not specifically included under other items.
 - b. The CONTRACTOR is advised that failure to conform fully and strictly to each and every provision of this specification, and to the underlying Highway Work Permit, will result in a loss of one full day's payment for maintenance of traffic for each and every day of failure to comply.
 - 1) The amount of non-payment calendar days will be determined by dividing the lump sum amount Bid for this item, by the number of days between the Notice to Proceed and the contractual completion date with no consideration to any extension of Contract Time.
- N. **Payment Item 7 - Installation and Maintenance of Temporary Erosion and Sediment Control Practices**
1. **Work Included:** This item shall include for payment all labor, materials, tools, and equipment necessary to provide, maintain, and replace, as necessary or directed, all environmental protection and erosion and sediment control as shown and specified, and in accordance with all regulatory rules and permits.
 2. **Payment:** The lump sum Bid for Payment Item 7 will be full compensation for all labor, tools, materials, and equipment used for providing and maintaining temporary environmental protection and erosion and sediment control practices.
- O. **Payment Item 8: Vegetated Surface Restoration**
1. **Work included:** This item shall include for payment all labor, materials, tools and incidentals required to furnish, install and restore all vegetated surfaces as shown and specified in accordance with Section 2K and 2P except that specifically included under other items of this Contract.
 - a. Item 8 shall include but not be limited to the following:
 - 1) Furnishing topsoil from on site stock piles or from offsite sources, spreading topsoil, preparation of seedbed, seeding

and planting of lawn, grassed, and ground covered areas, mulching, and maintaining of all restored vegetated surfaces.

- 2) Furnishing, installing and maintaining jute matting as shown on the Contract Drawings and as ordered by the ENGINEER.
2. Measurement of in place quantities shall be made by the ENGINEER. The CONTRACTOR may at his own expense verify the quantities.
 - a. The length of the replacement section shall be measured along the horizontal projection of the center line of the pipeline trench.
 - b. The width of the restored section shall be measured at right angles to the center line of the pipe and shall be limited in width by the edge of the right of way or permanent plus temporary easement as applicable, or the width shall be measured 12½ feet on either side of the center line of pipes for a total not to exceed 25 feet in width.
 3. Payment: The unit price contained in the Bid per square yard will be full compensation for furnishing, installing and maintaining all vegetated surface restoration and jute matting complete as shown and specified and not specifically included under other items.

P. Payment Item 9 - Extra Earth Excavation

1. Measurement: This item shall include extra excavation of all materials regardless of type, character, composition, moisture content or condition thereof. Extra earth excavation, which will be included under Item 9, will be measured for payment on the basis of the lines and grades ordered by the ENGINEER, or as the volume within the limits described below, whichever is applicable. Extra earth excavation shall be for access pits in excess of seven (7) feet to top of pipe, for Work in addition to that shown on the Drawings or included in the Contract Documents or which is ordered by the ENGINEER in writing. Extra earth excavation shall include the applicable requirements of Section 2B-Clearing, Section 2C-Abandonment, Demolition and Removal, Section 2D1-Excavation, Trenching and Backfill including: site preparation; excavating; storage of materials; installation and removal of all necessary bracing, shoring, and sheeting; drainage and dewatering; satisfactory disposal of surplus and/or unacceptable materials; restoration of existing facilities and site; environmental protection and erosion and sediment control; installation and removal of temporary fencing; and all miscellaneous and appurtenant Work. The cost of installing all unclassified backfill material to replace the extra excavated material including refurbishing of all unclassified backfill is included in Item 11.
 - a. For extra excavation for pipes, the volume of the trench which will be paid for will be that contained in a prism with sides as shown in the Contract Drawings with widths measured from the outside diameter of the pipe laid therein, exclusive of bells, branches, hubs, spurs or concrete cradles, and a depth from the surface of the

ground, at the centerline of pipe, to the bottom of the excavation. Enlargements of the trench, authorized by the ENGINEER where necessary to facilitate the support of existing structures, or for other reasons, will be measured for payment to the limits excavated in accordance with orders. The length shall be equal to the laid length of pipe, measured horizontally along the centerline.

- b. All extra excavation for structures or facilities other than pipe will be measured for payment from the subgrade directed for such excavation and, unless otherwise shown or directed, to vertical planes one foot outside the foundation limits of the structure to be built therein.
 - c. Measurement of the actual quantities of materials will be made by the ENGINEER. The CONTRACTOR may, at his expense, verify the quantities.
2. Payment: The unit price per cubic yard for Item 9, Extra Excavation will be full compensation for providing all extra earth excavation complete as shown and specified and as ordered in writing by the ENGINEER, and not specifically included under other items or Contracts.

Q. Payment Item 10 - Extra Foundation Stone

1. Measurement: The quantity of extra foundation stone, which will be included under this item, will be the computed number of cubic yards placed in addition to that shown or included in the Contract Documents, and which are ordered by the ENGINEER. No payment will be made for extra foundation stone which is used for refill when excavation is carried below the grades shown, specified or ordered, or for that used for controlling ground water. Extra foundation stone will be measured for payment as the compacted volume in place between the limits directed by the ENGINEER to replace unsuitable material, to improve pipe bedding, to increase the load carrying capacity of pipe, and to serve as foundation support for structures, less any amount credited to the OWNER where the foundation stone base is omitted. All foundation stone shall be wrapped in filter fabric as detailed in the Contract Drawings. Extra foundation stone shall include supplying, hauling from on or offsite locations, placing, grading and compacting the material, as well as supplying, placing and wrapping the stone in filter fabric. Extra foundation stone and filter fabric materials shall meet the requirements of Section 2D1.
2. Payment: The unit price bid per cubic yard for Item 10 will be full compensation for providing all extra foundation stone and filter fabric complete as ordered in writing by the ENGINEER, and not specifically included for payment under other items.

R. Payment Item 11 - Extra Select Backfill

1. Measurement: The quantity of extra select backfill, which will be included under Item 11, will be the computed number of cubic yards placed in addition to that shown or included in the Contract Documents, and which are ordered by the ENGINEER. No payment will be made for

extra select backfill which is used for refill when excavation is carried below the grades shown, specified or ordered. Extra select backfill will be measured for payment as the compacted volume in place between the limits directed by the ENGINEER less any amount credited to the OWNER where the extra select backfill is omitted. Item 11 shall include supplying, hauling, from on or offsite sources, placing, grading and compacting the material. Materials shall meet the requirements of Section 2D1.

2. Payment: The unit price bid per cubic yard for Item 11 will be full compensation for providing all extra select backfill complete as ordered in writing by the ENGINEER, and not specifically included for payment under other items.

S. Payment Item 12 - Extra Tracking Pad

1. Measurement: The quantity of extra tracking pad, which will be included under this item, will be volume of tracking pad in square yards actually furnished and placed in addition to that shown or included in the Contract Documents, and which is ordered by the ENGINEER. No tracking pad which is paid for under other items will be paid for under this item. Extra tracking pad will be measured for payment on the basis of lines and grades ordered by the ENGINEER. Extra tracking pad shall meet the requirements of Section 2D1.
2. Payment: The unit price bid per square yard for Item 12 will be full compensation for providing all extra tracking pad complete as ordered in writing by the ENGINEER, and not specifically included for payment under other items.

T. Payment Item 13 - Flexible Multi-Layer Pressure Liner (FMPL):

1. Work Included. Payment Item 13 shall include all the requirements for furnishing and installing all Flexible Multi-Layer Pressure Liner (FMPL), including, but not limited to, all cleaning and disinfection, proper disposal of highly chlorinated water, service lateral restoration, connectors, flanges, terminators, excavation and backfill, temporary pavement restoration, labor, materials and equipment, and all other appurtenant materials and equipment necessary to install liner as specified and as contained in the following divisions and sections of the Contract Documents:
 - a. Division 1, General Requirements, all Sections except the following:
1G13, Maintenance and Protection of Traffic
 - b. Division 15, Piping:
All Division 15 piping work required for furnishing and installing Flexible Multi-Layer Pressure Liner (FMPL) not specifically included under other payment items of this Contract.
2. Measurement:
 - a. The quantity of Flexible Multi-Layer Pressure Liner (FMPL) which will be included under Item 13 will be the actual number of

- linear feet of Flexible Multi-Layer Pressure Liner (FMPL):
furnished and installed.
- b. The lengths of Flexible Multi-Layer Pressure Liner (FMPL) indicated by the stationing shown on the Drawings are approximate. The CONTRACTOR shall provide the lengths of pipe necessary to make the required connections at the inverts shown.
 - c. The length shall be measured along the horizontal projection of the centerline of the pipe as installed from the point of beginning to the point of ending.
3. Payment: The unit prices contained in the Bid for Item 13 will be full compensation for furnishing and installing all Flexible Multi-Layer Pressure Liner (FMPL) complete as shown and specified and not specifically included for payment under other items.

++END OF SECTION++

SECTION 15B4

CLEANING AND LINING WATERMAINS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Scope:
1. CONTRACTOR shall provide all labor, materials, tools, equipment and incidentals required to clean, install lining, restore services, test, and disinfect all watermains as shown, specified and required to complete the Work.
 2. Cleaning and lining of watermains includes the following activities described under other Sections in these specifications but included under this Section unless specifically noted otherwise.
 - a. Coordinating the construction.
 - b. Cutting and patching.
 - c. Connections to existing facilities.
 - d. Transportation, storage and handling of equipment and materials.
 - e. Abandonment, demolition and removal.
 - f. Clearing.
 - g. Excavation trenching and backfill.
 - h. Disposal of excess material.
 - i. Sheeting, shoring and bracing, timber and steel.
 - j. Surface and ground water control.
 - k. Class A and Class B concrete.
 - l. All types and sizes of buried piping, unless specifically included under other Sections or contracts. These include, but are not limited to: ductile iron, copper and thermoplastic.
 - m. Supports, restraints, and thrust blocks as required for all pressure pipe.
 - n. Work on existing pipelines and structures.
 - o. Testing.
 - p. Cleaning.
 - q. Pipe anchors and encasement.
 - r. Installation of all joints, jointing and gasketing materials, specials, couplings, flexible couplings, mechanical couplings, adapters, harnessed and flanged adapters, sleeves, tie rods, closures, end caps, bulkheads, plugs, bolts, nuts, and all other Work required to complete the Work as shown or required.
 3. All valves and specials shown or specified shall be incorporated into the piping systems as shown, specified, and as required.

4. Unless otherwise shown or specified, cleaning and lining water mains includes all Work shown on the Drawings or required for the complete installation of cementitious lining, as required to include reconnection of severed mains.
 - a. The lengths of pipe indicated by the stationing shown on the Drawings are approximate. The CONTRACTOR shall line the lengths of pipe necessary to complete the Work. The CONTRACTOR shall notify the ENGINEER if the pipe cannot be lined.
 - b. The CONTRACTOR shall be paid for the actual length of pipe lined at the accepted unit prices bid by the CONTRACTOR.
 - c. The length shall be measured along the horizontal projection of the centerline of the pipe as installed from the point of beginning to the point of ending.
- B. Coordination:
1. Review installation procedures under other Sections and coordinate with the Work that is required under this Section.
- C. Related Sections:
1. Division 2, Site Work.
 2. Division 3, Concrete.
 3. Division 15, Piping.

1.2 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies:
1. Comply with applicable provisions of the following regulatory agencies:
 - a. Putnam County Department of Health
 - b. County and Town Highway Departments.
 - c. Underwriters' Laboratories, Incorporated (UL and FM).
 - d. Other authorities having jurisdiction.
- B. Cleaning and Lining:
1. Guarantee to restore cleaned and cement-mortar lined water mains to following minimum Hazen-Williams C Factor (C_{hw}) based on nominal pipe diameters with proper allowance being made for bends and fittings following accepted practice:

NOMINAL PIPE DIAMETER	GUARANTEED HAZEN-WILLIAMS C _{hw} FACTOR
3 inch and smaller	90
4 inch	90
6 inch	100
8 inch	110
10 inch	115
12 inch	120
14 inch	125
16 inch	125
20 inch	125
Above 20 inch	130

- C. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.
1. ANSI/AWWA C602-17 Cement Mortar Lining of Water Pipelines In Place - 4 in. and larger.
 2. ASTM D 2321, Recommended Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe.
 3. ASTM C 1173 Standard Specification for Flexible Transition Couplings for Underground Piping Systems.
 4. AWWA C111 (ANSI A21.11), Rubber Gasket-Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings.
 5. AWWA M 23, PVC Piping.
 6. GLUMRB, Recommended Standards for Water Works.
 7. ANSI/NSF Standard 61
 8. AWWA M28 Rehabilitation of Watermains.
 9. ASTM C39 Concrete Cylinder Compression Testing

1.3 SUBMITTALS

- A. Performance Work Statement (PWS) Submittal
1. The CONTRACTOR shall submit, to the OWNER, a Performance Work Statement (PWS) at the pre-construction meeting, which clearly defines the cementitious lining product delivery in conformance with the requirements of these Contract Documents. Unless otherwise directed by the OWNER, the PWS shall at a minimum contain the following:
 - a. Clearly indicate that the proposed lining will conform to the project requirements as outlined in the Summary of Work and as delineated in these specifications.
 - b. Where the scope of work is specifically delineated in the Contract Documents, a detailed installation plan describing all preparation Work, cleaning operations, pre-lining inspections, traffic control,

installation procedure, method of curing, service reconnection, quality control, Hazen-Williams C Factor testing to be performed, final test section procedure, warranties furnished and all else necessary and appropriate for a complete cementitious lining installation. A detailed installation schedule shall be prepared, submitted and conform to the requirements of the Contract.

- c. CONTRACTOR's description of the proposed lining equipment and technology, including a detailed plan for identifying all active service connections, maintaining service during mainline installation, to each home connected to the section of pipe being lined, including temporary service.
- d. A detailed Public Notification Plan shall be prepared and submitted including detailed staged notification to residences of temporary water installation, transition to and from, and Project Schedule by street and block.

B. Shop Drawings: Submit for approval the following:

- 1. Full details of pipe, fittings, specials, supports, and connections to existing pipes, equipment, and structures, including dimensions, sizes, classes, etc.
- 2. Typical joint and harnessing details.
- 3. Detailed descriptions of proposed field testing and disinfection including information and data pertaining to procedures and apparatus.
- 4. Method of covering access excavations during non-working periods.
- 5. Proposed method for disposal of debris and water used for cleaning.
- 6. Cement mortar lining mix data including dry weights of cement; sand; admixture name; type and quantity, if used; volume of water per cubic yard.
- 7. Flexible multi-layer pressure liner

C. Submit all data as may be required as conditions of any highway permits or environmental permits.

D. Test Reports: Submit copies of all test and proofing reports.

E. Certificates: Submit certificates of compliance with referenced standards.

F. Record Drawings: During progress of the Work, keep an up-to-date set of drawings showing field and Shop Drawing modifications. The drawings shall show all piping on plans and in sections, with all reference dimensions and elevations required for complete record drawings of the piping systems. All piping installed shall be shown on the record drawings. Coordinate with Section 112.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Ship cement to Contract site in full sacks and store so it is kept dry. Do not use cement from broken sacks for lining operations.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Pipe and Fittings: Follow Division 15.
- B. Temporary Water Supply: Follow Section 15B5
- C. Cleaning and Cementitious Lining: AWWA C602 except as modified herein.
 - 1. Sand: ASTM C144 and kept clean and free of foreign materials during transportation and storage on site.
 - 2. Cement: Type II, manufactured at facility certified for compliance with ANSI/NSF Standard 61, and in sacks bearing NSF approval stamp.
 - 3. Proportions of cement and sand in mortar: 1 part cement to 1 part sand.
- D. Equipment:
 - 1. Cleaning:
 - a. Drag cleaning, hydraulic jet, abrasive pig, metal scraping, or power boring type. Use of chain knocker with centering axle allowed if approved by ENGINEER.
 - 2. For placing cement mortar lining:
 - a. Applicator head that in one course centrifugally projects mortar against surface of pipe sections and long radius bends, without injurious rebound, and with sufficient velocity to cause mortar to be densely packed and to adhere in place.
 - 1. Rate of travel of machine and rate of discharge of mortar against wall of pipe shall be entirely mechanically controlled to produce smooth, uniform thickness of lining throughout interior of pipe.
 - 2. Attachment with rotating or drag steel trowels follows applicator head and trowels cement mortar lining to a smooth, hard surface of uniform thickness.
 - 3. Operation of trowels: Continuous during application of cement mortar and forward movement of applicator head.
 - 4. Machine.
 - a. Moves ahead of lining so nothing comes in contact with troweled surface until it has attained its final set.

6. Remove pipe at access points by cutting with power operated pipe cutting machines, capable of making fast, true and smooth cuts so valves or pipe sections removed may be replaced in true alignment.
 - a. Where difficulties due to obstructions make it impossible to use preceding method of cutting pipe, other methods may be used provided they meet ENGINEER's approval and same results are attained with no additional cost to the OWNER.
7. Measure outside diameter of cut pipes to properly determine class of pipe in each cut.
 - a. Class of pipe will determine proper sized sleeves or couplings to be used in reconnection.
8. Replace exposed lead or poured joints with mechanical joint fittings or couplings at ENGINEER's direction.

3.2 CLEANING AND LINING

- A. Perform cleaning and lining following AWWA C602 and as specified herein.
 1. Cleaning:
 - a. Clean interior surfaces of pipes and fittings to be lined by machine where practical and by hand where access by machine is not possible.
 - b. Remove obstructions in pipeline that prohibit passage of cleaning or lining equipment.
 - c. Remove loose scale, tuberculation, oil, grease, remains of old coating materials, and accumulations of debris.
 - d. Remove accumulations of water on bottom of interior of pipe.
 - e. Handle cleaning water in closed discharge hoses to prevent water and residue from causing damage.
 - f. Dispose of residue from cleaning and other construction operations as well as water from dewatering operations, in a manner satisfactory to ENGINEER.
 - g. Proof cleaned main with appropriate diameter pig. Provide proof results to Engineer prior to initiating lining procedure.
 - h. Ensure all curb valves are operational prior to initiating lining procedure. Replace inoperable curb valves.
 2. Lining:
 - a. Place lining with machines in 1 course as specified herein.
 - b. Thickness of cement mortar lining shall be uniform and shall follow AWWA C602.
 - c. Nominal lining thickness for all gray cast iron and ductile iron:

Pipe Diameter, in.	Lining Thickness, in.	Tolerance, in.
4-10	3/16	-1/16, +1/8
12-20	1/4	-1/16, +1/8

- d. Correct lining not within this tolerance at ENGINEER's direction.
- e. Place cement mortar lining so as not to seal or otherwise reduce effectiveness of existing air valves and blowoffs.
- f. Perform cement mortar lining of sharp bends, fittings, and areas closely adjacent to valves or other points where machine access is impossible or impractical and correct defective areas by hand.
- g. Hand mortar work: Equal to machine placed work and use same materials.
 - 1. If necessary, moisten pipe prior to placement of mortar.
 - 2. Use steel trowels except where curvature of bends prohibit their use.
 - 3. Complete handwork in section of pipeline with 24 hours after machine work in that section is complete.
 - 4. Provide smooth transition from handwork to machine-placed mortar.
- h. Remove bends, fittings and pipe that cannot be lined by hand. Provide new bends, fittings and pipe.
- i. Feather edges between newly lined areas and unlined areas.
- j. Clean and line mains up to side valves and sections of pipe removed for access.
- k. Remove cleaning debris and lining material from existing service connections on lined main.
 - 1. Clear service connections that are 2-inch or less in diameter and on pipes less than 24-inch diameter by backflushing with air or water within 2 hours of placing lining.
 - 2. On pipes 24-inch and larger, temporarily plug or cover service connections prior to lining, and remove plugs or covers after lining.
 - a. Service connections may be flushed with ENGINEER's prior approval.
 - 3. Do not damage lining when clearing service connections.
- l. Immediately after completing lining of length of pipe between access openings or at end of day's run, close that section of pipe at each end and cover access openings to prevent circulation of air to maintain moist condition.
- m. With ENGINEER's approval, 24 hours after placing lining, fill section between bulkheads or gate valves with system water for curing lining.

- n. Cure pipe lining for minimum of 48 hours before recharging and disinfecting.
- B. Disinfection:
- 1. Disinfection of potable watermains and service connections shall be in strict accordance with AWWA C651 except the tablet method which is not acceptable.
 - a. Hypochlorite shall be in accordance with AWWA B300.
 - b. Bacteriological Tests shall be in accordance with Standard Methods for the Examination of Water and Wastewater, latest edition.
 - c. Preventative measures shall be taken to keep pipe clean and dry during construction or repair.
 - d. Chlorination shall be by the continuous flow method in strict accordance with AWWA C651.
 - e. Notify the ENGINEER at least 48 hours in advance of a scheduled test so that the test may be witnessed.
 - 2. Conditions of Chlorination:
 - a. Flush piping minimum velocity 2.5 f/s.
 - b. Chlorinate water entering pipe to a free residual of no less than 25 mg/L.
 - c. Retain the chlorinated water in the main for no less than 24 hours.
 - d. At the end of the 24 hours the water in the main shall have a free residual of no less than 10mg/L.
 - e. After successful testing and the required retention period remove the chlorinated water from the pipe.
 - 3. Sampling:
 - a. Perform total coliform testing, in accordance with “Standard Methods”, on the samples collected at the points indicated in AWWA C651 sec. 7-1, 7-2, 7-3, and where directed by the ENGINEER.
 - b. Collect samples in accordance with the “Standard Methods” and take care not to contaminate the samples. Submit results of total coliform testing to the ENGINEER.
 - c. Collect samples after 24-hour disinfection period. Collect one sample per day on two consecutive days.
 - d. Samples shall be tested for total coliform and heterotrophic plant count.
 - 4. Rechlorination: In case of test failure, rechlorinate until acceptable in accordance with AWWA C651.
 - 5. Disposal of Chlorinated Water:
 - a. Neutralize heavily chlorinated water.

- b. Dispose of the spent water in accordance with Federal, State and local regulations.
 - c. Do not discharge so as to cause damage to the environment. Refer to Section 2P.
- C. Returning Lined Main to Service.
- 1. When disinfection is completed and line is approved for service, ENGINEER will notify CONTRACTOR to restore line to service.
 - a. Remove corporation stops used for disinfection and install plugs.
 - b. Coat plug assemblies.
 - c. After pipe access openings are closed and before backfill, fully recharge main and eliminate visible leakage.
 - 2. After approval of ENGINEER.
 - a. Backfill excavated areas.
 - b. Reactivate house connections and remove temporary bypass piping system.
 - 3. After permanent service is restored and temporary bypass piping is removed, restore disturbed areas.
 - a. Seed and sod following Section 2P.
 - b. Restore pavement following Section 2I2.
 - c. Dispose of valves and fire hydrants removed from lined section of watermain and not reused.
- D. Field Quality Control
- 1. Inspection
 - a. Provide CCTV inspection of completed lining sections to ENGINEER.
 - b. Use equipment approved for use in potable water system.
 - c. Correct defective lining at ENGINEER's approval.
 - 2. Cement Mortar Lining.
 - a. Test cement mortar tests samples in accordance with ASTM C39.
 - b. Samples shall attain a 28 day compressive strength of 4500 psi.
 - c. Lining that fails to meet compressive strength requirements shall be rejected.
 - 3. Removal of Test Section
 - a. At ENGINEER's direction, excavate, cut and remove test section of pipe 3 feet long for applied cement lining thickness verification and inspections.
 - b. Provide one test section for every 2,000 feet (or part thereof) of pipe lined.
 - c. If thickness is not within specified requirements herein, proceed as follows:

1. Remove additional test sections within that 2000 foot run, As directed by ENGINEER, to determine the limits of non-compliant lining.
 2. Correct lining thickness or re-line as directed by ENGINEER.
 - d. After inspection, reinstall removed pipe section utilizing sleeves.
 - e. Backfill excavation and repair paving as required.
4. Testing
- a. Test completed sections to determine Hazen-Williams C Factor.
 - b. Tests shall be taken as follows:
 1. 2 Tests in the Everett Road Complex
 2. 2 Tests in the Fair Street Complex
 3. 2 Tests in the Lakeview Road Complex
 4. 1 Test each in Vink/Waring Road, Old Route 6, and in the Everett Tank to Old Route 6.
 - c. If Hazen-Williams C Factor (C_{hw}) determined by test is less than guaranteed minimum values herein, remand to ENGINEER for resolution.

++END OF SECTION++

SECTION 15B5

TEMPORARY WATER MAINS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. CONTRACTOR shall provide all labor, materials, tools, equipment and incidentals required to furnish, install, test, disinfect, operate, maintain and remove all temporary water mains as shown, specified and required to complete the Work. In general, a temporary water system shall be provided for consumers on all streets in which water mains are to be lined and where directed by the OWNER for the course of this Work. At no time during this project shall any municipal structures, residences or buildings served by the water district be deprived of water service or endure a service disruption of greater than four (4) hours as a result of the project. Temporary hydrants shall be installed at the same locations where hydrants are taken out of service during construction.
2. Temporary water mains includes the following activities described under other Sections in these specifications but included under this Section unless specifically noted otherwise.
 - a. Coordinating the construction.
 - b. Cutting and patching.
 - c. Connections to existing facilities.
 - d. Transportation, storage and handling of equipment and materials.
 - e. Abandonment, demolition and removal.
 - f. Clearing.
 - g. Excavation trenching and backfill.
 - h. Disposal of excess material.
 - i. Surface and ground water control.
 - j. Class A and Class B concrete.
 - k. All types and sizes of temporary piping, unless specifically included under other Sections or contracts. These include, but are not limited to: ductile iron, reinforced concrete and thermoplastic.
 - l. Supports, restraints, and thrust blocks as required for all pressure pipe.
 - m. Work on existing pipelines and structures.
 - n. Testing.
 - o. Cleaning.
 - p. Pipe anchors and encasement.

- q. Installation of all joints, jointing and gasketing materials, specials, couplings, flexible couplings, mechanical couplings, adapters, harnessed and flanged adapters, sleeves, tie rods, closures, end caps, bulkheads, plugs, bolts, nuts, and all other Work required to complete the Work as shown or required.
 - r. Temporary and permanent pavement restoration.
 - 3. All valves and specials shown or specified shall be incorporated into the piping systems as shown, specified, and as required.
 - 4. Unless otherwise shown or specified, temporary water mains includes all Work shown on the Drawings or required for the complete installation of temporary water mains as required to include removal of temporary mains.
 - a. The lengths of pipe indicated by the stationing shown on the Drawings are approximate. The CONTRACTOR shall install the lengths of pipe necessary to complete the Work. The CONTRACTOR shall notify the ENGINEER if the pipe cannot be installed.
 - b. The CONTRACTOR shall be paid for the actual length of pipe installed at the accepted unit prices bid by the CONTRACTOR.
 - c. The length shall be measured along the horizontal projection of the centerline of the pipe as installed from the point of beginning to the point of ending.
- B. Coordination:
 - 1. Review installation procedures under other Sections and coordinate with the Work that is required under this Section.
- C. Related Sections:
 - 1. Division 2, Site Work.
 - 2. Division 3, Concrete.
 - 3. Division 15, Piping.

1.2 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies:
 - 1. Comply with applicable provisions of the following regulatory agencies:
 - a. State, County and Town Highway Departments.
 - b. State and local building codes and ordinances.
 - c. Underwriters' Laboratories, Incorporated (UL and FM).
 - d. Other authorities having jurisdiction.
- B. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified:

1. GLUMRB Recommended Standards for Water Works
2. ASTM D 2774, Underground Installation of Thermoplastic Pressure Piping.
3. ASTM D 2241, Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)
4. ASTM D 1784 Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
5. ASTM D3139 Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
6. ASTM F 477 Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
7. NSF/ANSI 61-2019 – Drinking Water Components Health Effects
8. AWWA C605, Recommended Practice for the Installation of PVC Pressure Pipe.

1.3 SUBMITTALS

- A. General: Submit shop drawings and products in accordance with Section 1E4, Shop Drawing Submittal and Correspondence Procedure.
- B. Emergency Availability: The CONTRACTOR shall submit to the OWNER a list of CONTRACTOR employees that can be contacted during non-work hours (work hours are noted in the General Conditions) along with their respective telephone numbers. Listed employees shall be available to the site within 20 minutes notice, and shall be capable of making and supervising emergency repairs and restoring service. The CONTRACTOR shall update this list as necessary throughout the project.
- C. A detailed Public Notification Plan shall be prepared and submitted including detailed staged notification to residences of temporary water installation, transition to and from, and project schedule by street and block.

PART 2 PRODUCTS

2.1 GENERAL

- A. Temporary Water Pipe:
 1. PVC Pressure Pipe;
 - a. PVC pressure pipe and fittings shall be as shown on the Contract Drawings. PVC material to meet requirements of ASTM D1784.
 - b. Elastomer gaskets shall be of the non-permanent type and shall conform to ASTM D3139.

- c. PVC pressure pipe shall be Yelomine PVC pipe (NSF 61 approved), as manufactured by NAPCO, of Houston TX, or equal.
- d. Temporary water mains shall be two (2) inches or larger for house service lines and four (4) inches or larger for fire protection lines.
- 2. Restraint Systems for C900 PVC Pressure Pipe:
 - a. All couplings and fittings shall be restrained. Provide gasketed non-permanent Certa-Lok couplings and fittings with splines as manufactured by NAPCO, of Houston TX, or equal.
- 3. House service lines connected to the bypass pipe shall be three quarter (3/4) inch and be rated for 200 PSI.
- 4. Temporary hydrants shall consist of a tee with a butterfly valve connected to the tee with a nut to control the valve.

PART 3 EXECUTION

3.1 GENERAL

- A. The temporary water system shall not be put into service prior to the approval of the OWNER. The existing water main shall not be shut off prior to the approval by the OWNER. Once approved, the temporary system shall remain in service until the relined water main is approved by the OWNER. The OWNER reserves the right to disconnect the temporary bypass water system at any time.
- B. The temporary system shall be connected as shown and specified. Connections will be via a fire hydrant or by tapping into the mainline where a hydrant is unavailable. Hydrants shall be properly flushed prior to bypass line connection.

3.2 PIPE LAYOUT

- A. Piping shall be laid out so as to ensure continuous service throughout its life on the Project. Pipe shall be placed so as not to be a hazard to pedestrian and vehicular traffic. Mains shall be installed along side of the curb where possible and shall be contoured along the curb line. All pipe, services, and fire hose connections shall be protected by delineators and cones.
- B. When pipe crosses a roadway, it shall be laid in a trench that is two (2) inches deeper than the pipe size. The trench shall be backfilled with approved imported granular fill to one inch (1") below the existing pavement and backfilled to grade with Type 3 binder.
- C. Pipes located in driveways, gutters or other areas subject to vehicular traffic shall be adequately protected with the use of rubber or plastic ramps over the pipe. Mounding of asphalt pavement or Item 4 over the pipe will not be accepted.

- D. Bypass piping shall be removed during winter shutdown periods.

3.3 HOUSE CONNECTIONS

- A. Temporary service connections to residential or commercial buildings shall be made at the exterior sill cock.
- B. The actual connecting of the temporary service connections including pressure regulating devices to the meter or other appurtenances will be done by the CONTRACTOR unless otherwise directed by the OWNER. Water service lines will be shut off or opened at the curb by an employee of the Water Department, unless otherwise directed by the OWNER.
- C. The CONTRACTOR shall notify the consumers at the following intervals in advance of commencement of temporary water supply:
 - 1. 14 days
 - 2. 7 days
 - 3. Forty-eight (48) hours

3.4 DISINFECTION AND BACTERIOLOGICAL TEST

- A. General: All temporary potable water piping and appurtenances shall be disinfected with chlorine after completion and testing of the piping, and before restoration of water service from the water main and subsequent removal of temporary water service.
- B. Disinfection of potable watermains and service connections shall be in strict accordance with AWWA C651 except the tablet method which is not acceptable.
- C. Disposal of Chlorinated Water shall be in accordance with Section 15B4.

3.5 HYDRANT PRESSURES

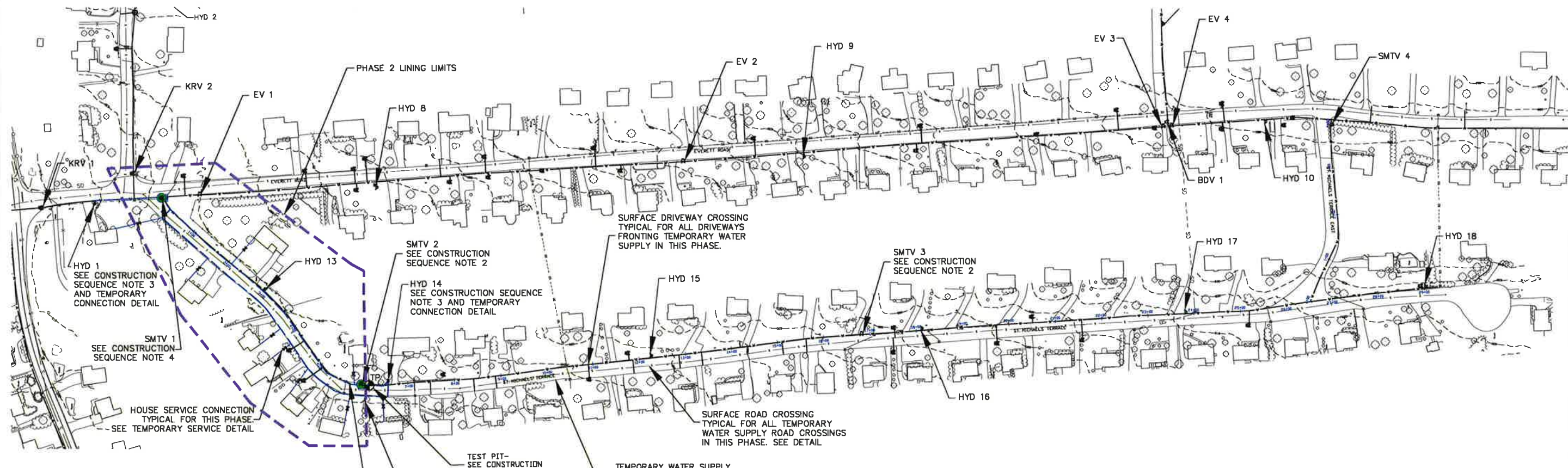
- A. The CONTRACTOR shall coordinate with the OWNER to obtain existing hydrant pressures where needed to properly implement temporary water mains. Pressure reducing valves shall be incorporated into the temporary water main system to protect the plumbing systems in all local facilities, structures, and private residences.
- B. If hydrant pressure data is not available for all of the hydrants affected, the CONTRACTOR shall provide all equipment and labor required to obtain such data at no cost to the OWNER.

- C. The CONTRACTOR shall conduct flow tests on the temporary hydrants where directed by the OWNER at no additional cost to the OWNER.

3.7 IDENTIFICATION BADGES

- A. CONTRACTOR's employees shall have on their persons, at all times, displayed in a conspicuous manner, picture identifications. The picture I.D. shall have the CONTRACTOR's name, employee's name, title and signature. CONTRACTOR shall provide to Town of Carmel an employee list indicating employee names, identification numbers and social security numbers.

++END OF SECTION++



CONSTRUCTION SEQUENCE:

- 1). EXCAVATE TEST PITS TO CONFIRM PIPE TYPE & DIAMETER.
- 2). INSTALL NEW GATE VALVES SMTV 4, SMTV 2 AT STATION 6+00, SMTV 3 AT STATION 16+90 PRIOR TO COMMENCEMENT OF TEMPORARY WATER SERVICE AND LINING OPERATION.
- 3). CONNECT TEMPORARY SERVICE AT HYDRANTS 1 & 14. PROVIDE TEMPORARY WATER MAIN WITHIN PHASE 2 LINING LIMITS ALONG ST. MICHAEL TERRACE.
- 4). ISOLATE PHASE 2 MAINS FOR CLEANING AND LINING USING THE FOLLOWING VALVES:
 - 4.1). EXISTING VALVE IN ST. MICHAELS TERRACE ACROSS FROM HILLSIDE (SMTV 1)
 - 4.2). NEW GATE VALVE SMTV 2
- 5). CLEAN, LINE, TEST, AND DISINFECT ST. MICHAELS TERRACE, STATION 0+00 TO 6+00.

GENERAL TEMPORARY WATER NOTES:

- 1). PROVIDE 4" MAINS ON EACH SIDE OF ROAD.
- 2). PROVIDE 2" SERVICE LINES WITH VALVE TO HOSE BIB AT EACH RESIDENCE. SEE DETAIL.
- 3). PROVIDE A BACK FLOW PREVENTER AT EACH TEMPORARY SUPPLY CONNECTION TO HYDRANT, SEE DETAIL.
- 4). PROVIDE TEMPORARY HYDRANTS ADJACENT TO EXISTING HYDRANTS. SEE DETAIL.
- 5). MAINTAIN TEMPORARY SERVICE THROUGHOUT CLEANING, LINING AND TESTING PROCESS.
- 6). REMOVE TEMPORARY SERVICE AFTER OWNER AUTHORIZES PLACING RELINED MAINS BACK INTO SERVICE.

EXISTING 8" ASBESTOS CEMENT MAIN

EXISTING 8" WATER MAIN TO BE LINED. SEE CONSTRUCTION SEQUENCE NOTES 1 & 5



ISSUED FOR BID

WARNING- IT IS A VIOLATION OF NEW YORK EDUCATION LAW, SECTION 7209.2, FOR ANY PERSON, UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER OR LAND SURVEYOR, TO ALTER THIS DOCUMENT IN ANY WAY. IF ALTERED, THE ALTERING PERSON SHALL COMPLY WITH THE REQUIREMENTS OF NEW YORK EDUCATION LAW, SECTION 7209.2

REVISIONS			
NO.	BY	DATE	REMARKS

DES.	SPH
DWG.	SPH
CHK.	JEF

J R F A

J. ROBERT FOLCHETTI & ASSOCIATES, L.L.C.

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CARMEL WATER DISTRICT 2
TOWN OF CARMEL, PUTNAM COUNTY, NEW YORK

WATER MAIN REHABILITATION PROJECT

EVERETT ROAD COMPLEX LINING PHASE 2 ST. MICHAELS TERRACE

SCALE: 1" = 100'

JRFA

DATE DECEMBER 2020

G SHEET 6R OF 25

DWG. NO. _____