



ADDENDUM NO. 1

Greater New Haven Water Pollution Control Authority

**Sanitary Sewer Collection System On-Call Repairs
Project No. SSR 2022-02**

TO: ALL PLAN HOLDERS
DATE: May 24, 2022

This addendum shall be attached to the Request for Proposals Documents of Project No. **SSR 2022-02**. Each bidder shall acknowledge receipt of this Addendum by entering the Addendum number and date received in the space provided in the attached Addendum Acknowledgement Form.

The Specifications and Bid Documents are hereby modified as follows:

1. Modification of Technical Specifications, Item 524 – Sanitary Sewer Manhole Rehabilitation

Replace existing specification with the enclosed Item 524M – Sanitary Sewer Manhole Rehabilitation specification, revised on October, 2018.

2. Modification of Technical Specifications, Item 522 – Sanitary Sewer Television Inspection

Replace existing specification with the enclosed Item 522M – Sanitary Sewer Television Inspection specification, revised on May, 2022.

- END OF ADDENDUM No. 1 -

**ADDENDUM No. 1 ISSUED BY:
GREATER NEW HAVEN WATER POLLUTION CONTROL AUTHORITY**

FOR Thomas V. Sgroi, PE
Director of Engineering

GABRIEL VARCA
DIRECTOR OF FINANCE AND ADMINISTRATION.

**Greater New Haven Water Pollution Control Authority
Addendum Acknowledgement Form**

**Sanitary Sewer Collection System On-Call Repairs
Project No. SSR 2022-02**

Bidder acknowledges receipt of the Addenda listed below and further acknowledges that the provisions of each Addendum have been included in the preparation of this RFP.

Addendum No.	Date Received	Addendum No.	Date Received
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

COMPANY NAME (BIDDER): _____

Address of Bidder: _____

Phone Number: Area Code (_____) _____

I hereby sign this document acting within my authority as a duly authorized representative of the named Bidder. By signing below, I certify, acknowledge, and affirm that the information set forth in this document is true, accurate and complete to the best of my knowledge and belief.

Signature of Bidder: _____ **Dated:** _____

Name and Addresses of Members of the Firm:

ITEM 524M SANITARY SEWER MANHOLE REHABILITATION

DESCRIPTION:

The Contactor shall be responsible for furnishing all labor, supervision, products, materials, equipment, and incidentals required to complete all manhole rehabilitation work and testing in accordance with this Specification.

Work under this Item consists of sanitary sewer manhole rehabilitation necessary to provide a system that stops infiltration, exfiltration, restores structural integrity, and provides protection for structures subject to hydrogen sulfide corrosion.

All structures scheduled for rehabilitation shall be cleaned, prepared, repaired, patched and/or sealed as required prior to the application of a hybrid epoxy system or polyurethane coating system or fiber reinforced geopolymer or epoxy lining system.

MATERIALS:

A. GENERAL

1. Handling, formulation, and storage of the products and grouts shall be in strict conformance with the manufacturer's recommendations. The uncured compound and grouts shall be delivered to the site in unopened containers, with the date of manufacture clearly indicated.
2. Mixing and handling of the compounds and grouts and the constituents producing it, which may be toxic on contact or inhalation, shall be as recommended by the manufacturer and Contractor shall minimize hazard to personnel. The Contractor is responsible for providing appropriate protective measures to ensure that the components and the chemicals produced in mixing are under the control of the Contractor at all times and are not available to unauthorized personnel or others. Excess material resulting from rehabilitation operations shall be disposed of in a safe manner. All equipment and material shall be subject to the review of the Engineer.
3. All chemical materials used shall meet the following minimum application requirements:
 - a. All component materials shall be easily transportable by common carriers.
 - b. Packing of component materials shall be compatible with field storage requirements.
 - c. Components shall be packed in such a fashion as to provide for maximum worker safety when handling the materials and minimize spillage when preparing for use.

- d. Residual sealing materials shall be removed from the sewer after injection to ensure no flow reductions, restrictions or blockages of sewer flows.

B. EPOXY LINING SYSTEM

To complete a sanitary sewer manhole rehabilitation using an epoxy lining system, the Contractor shall apply a combination of a cementitious liner first, followed by an epoxy coating.

1. Cementitious liner

Approved products with required one-inch thick application:

- a. AP/M Permaform CR-9000;
- b. Strong-Seal MS-2C;
- c. Raven 755.

2. Epoxy coating

Approved products with specified thickness application:

- a. Raven 405: Required thickness – 125 mils;
- b. AP/M Permaform COR+GARD: Required Thickness – 125 mils.

C. HYBRID EPOXY SYSTEM

To complete a sanitary sewer manhole rehabilitation using a hybrid epoxy lining system, the Contractor shall apply CladLiner, a product of CladLiner, with a required thickness of 500 mils.

D. POLYURETHANE COATING SYSTEM

To complete a sanitary sewer manhole rehabilitation using a polyurethane coating system, the Contractor shall apply SprayWall Structural Polyurethane, a product of Sprayroq, with a required thickness of 500 mils.

E. FIBER REINFORCED GEOPOLYMER

To complete a sanitary sewer manhole rehabilitation using a fiber reinforced geopolymer system, the Contractor shall apply GeoKrete Geopolymer, a product of Quadex, with a required thickness of one-inch.

F. ACTIVE LEAK CONTROL

Active leak control materials are to be utilized to stop running water, infiltration, and other water stop needs. All active leak control materials must be compatible with the repair and lining materials proposed by the Contractor.

Approved materials include CladStop, Avanti AV-100, Strong-Plug, Strong-Seal Grout, or equal injection hydrophobic polyurethane products. Repair work shall follow manufacturer's recommended installation methods.

G. PATCHING, REPOINTING, FILLING AND REPAIRING NON-LEAKING HOLES, CRACKS AND SPALLS

Approved patching materials include CladRestore, Strong-Seal QSR, or equal. Patching materials must be compatible with the active leak control and lining materials proposed by the Contractor. Repair work shall follow manufacturer's recommended installation methods.

H. INVERT REPAIR

Invert repair shall be performed on all inverts with visible damage or where infiltration is present or when vacuum testing is specified. All invert repair materials must be compatible with the active leak control and lining materials proposed by the Contractor.

Acceptable products are CladRestore, Strong-Seal QSR, or approved equal.

I. MANHOLE FRAME CHIMNEY SEAL MATERIAL

Manhole frame chimney seals shall be applied of a corrosion resistant aromatic flexible urethane resin coating fully compatible with the manhole rehabilitation liner. The coating shall include a primer and a final coat. Frame chimney seals shall be Flex-Seal Utility Sealant as manufactured by Sealing Systems, Inc., Loretto, MN or equal.

CONSTRUCTION DETAILS:

A. REFERENCES:

The latest codes and standards referenced herein and belonging to the following organizations shall be followed:

1. American Society for Testing and Materials (ASTM)
2. National Association of Corrosion Engineers, NACE International (NACE)
3. The Society for Protective Coatings (SSPC)

4. Occupational Safety and Health Administration (OSHA)
5. Resource Conservation and Recovery Act (RCRA)
6. International Concrete Repair Institute (ICRI)
7. National Association of Sewer Service Companies (NASSCO)

B. SUBMITTALS:

1. The Contractor shall submit manufacturer's technical data, details, and specifications showing complete information on surface preparation and application procedures, material composition, physical properties and installation equipment.

The Contractor shall submit the testing procedure to ensure the liner system is of required thickness, strength and water-tightness. Provide a site-specific testing plan. Test records shall include GNHWPCA manhole identification, test used, location of each defect tested, and a statement indicating test results.

2. The technical data, with quantitative and qualitative values based on ASTM testing results, and/or other 3rd party testing methods shall demonstrate performance conformity with these specifications. If submitting an alternative product, please follow procedures set forth below.
3. The Contractor shall submit manufacturer's certification of applicator's successful completion of training in use of the application equipment, rehabilitation products, and rehabilitation procedures.
4. The Contractor shall submit warranty information.
5. In order to be considered as an equal product, said product will have to meet the minimum physical and performance properties of the products described herein as measured by the applicable ASTM standards referenced or other 3rd party referenced testing methods. Testing results must be performed and presented in the form of technical data sheets. Equal products' technical specifications/data and material safety data must be submitted to the Engineer a minimum of ten (10) days prior to bid date. Written product pre-approval is required to determine if the prospective product may be bid and utilized on this project(s). A product will be rejected as unacceptable should submittal to the Engineer not be received by the deadline and should the bid package not have enclosed a written approval from the Authority.

C. QUALITY ASSURANCE:

1. Product Manufacturer Qualifications – The manufacturers shall have a minimum

of 5 years' experience manufacturing the liner products.

2. Contractor Qualifications – The Contractor shall have at least 3-years' experience applying manhole lining systems. The Contractor shall have installed the lining system proposed for this project in a minimum of 200 manholes.
3. Single Source Responsibility - All products used with the lining system, including but not limited to, materials for infiltration control, invert repair and patching shall be approved by and supplied through the lining system manufacturer.
4. Quality Control of Application Conditions - The Owner reserves the right to cancel manhole rehabilitation work due to concerns with weather conditions. Provide continuous ventilation and, if necessary, cooling and heating facilities to maintain surface and ambient temperatures before, during, and following application of finishes, within temperature range and for duration as directed by the Manufacturer.
5. All work must be supervised by a foreman responsible for rehabilitating a minimum of 50 manholes using the proposed manufacturer's manhole lining system.

D. GUARANTEE:

1. Materials and labor shall be warranted by the Contractor of applied material systems for a minimum period of ten (10) years from the date of final acceptance of the project, once correctly applied by an approved applicator and inspected.
2. Failure will be deemed to have occurred if the protective system fails to (a) prevent the internal damage or corrosion of the underlying structure due to bacteriological, chemical, gaseous attack in the form of hydrogen sulfide (H₂S) found in sanitary sewer collection systems, (b) seal and protect the substrate and environment from contamination by effluent, (c) seal and protect from influent. It does not include excessive atypical non-wastewater induced chemical abuse, structural deficiencies, or atypical acts of God which cause hybrid damage.
3. Contractor shall, within a reasonable time after receipt of written notice thereof, repair defects in materials or workmanship which may develop during said warranty period, and any damage to other work caused by such defects or the repairing of same, at his own expense and without cost to the Authority.

E. LEGAL, SAFETY AND HEALTH REQUIREMENTS

The Contractor shall observe all federal, state and local laws, ordinances, policies, practices and regulations. In addition, the Contractor agrees to promptly procure all necessary approvals, licenses and permits, pay all charges and fees, and give all notices necessary and incident to the due and lawful prosecution of the work.

The Contractor shall conduct the work at all times in such a manner as to insure the least possible obstruction to traffic. The convenience of the general public and of the residents along and adjacent to the roadway shall be provided for in an adequate and satisfactory manner as the Engineer may direct.

All equipment and Materials shall be placed or stored in such locations so as not to be or to create the danger of becoming a hazard to the traveling public. No section of road shall be closed to the public except by permission of the municipality and Authority.

The safety provisions of applicable laws, building, construction and fire safety codes and the latest edition of the "Construction Safety Code, State of Connecticut, Labor Department", approved by the State Labor Commissioner, shall be complied with at all times.

The Contractor shall perform operations in strict accordance with OSHA and manufacturers' safety requirements. Particular attention is drawn to safety requirements involving entering confined spaces.

Damage incurred to the manhole or pipe segments due to methods and equipment employed by the Contractor is the responsibility of the Contractor. Damage to public and private property from sewer surcharging that results from material or equipment left in the manhole or sewer or from any flow blockage is the responsibility of the Contractor. The cost to repair the manhole or pipe segments and expenses incurred by the Authority as a result of the damage shall be the responsibility of the Contractor.

F. MANHOLE CLEANING / PREPARATION

1. Clean bench/invert floor and interior walls of manholes by removing deleterious material, including dirt, grease, and other debris. Use high-pressure water, at a minimum force of 3,000 psi. If required, use approved cleaners to remove grease, oil, and other matter, which would prevent a good bond between existing manhole wall and the approved repair materials.
2. Preparation of the interior surfaces shall conform to requirements of the wall liner material manufacturer. Loose and protruding brick, mortar and concrete shall be removed using a mason's hammer and chisel and/or scrapper. No debris shall be disposed of into the sewer system.
3. Active leaks shall be stopped and all interior surfaces shall be prepared as recommended by the lining manufacturer.
4. Insert plywood mats or sheeting over the existing flow channel and bench to prevent debris from falling into the sewer and to collect debris from manhole bench.
5. Existing manhole steps shall be removed, ground smooth, and patched. Step removal shall be incidental to the manhole rehabilitation costs.

6. Drop Connections – The Contractor shall confirm whether a drop connection exists. If one is found, the Contractor shall remove any interior drop connections anchored to manhole walls prior to installing the lining system. After installation and proper curing of the liner, the Contractor shall re-install interior drop connections to their original condition prior to removal. Installation of new inside drops, if requested by the Engineer, shall follow the Authority's standard construction detail SD523-08 & SD523-09.

G. GENERAL APPLICATION

Sewer manhole rehabilitation lining shall be applied in accordance with the material manufacturer's specifications. Plugging leaks and patching surfaces shall be performed where indicated or required. Coatings and sealants shall be applied to all surfaces from the manhole base to the manhole frame. Apply lining material to the manhole bench and produce a gradual slope from the walls to the invert with the thickness at the invert to be no less than 1 inch. Round the wall/bench intersection to a uniform radius the full circumference of the intersection.

H. MANHOLE FRAME CHIMNEY SEAL

Manhole frame chimney seal installation shall be in strict accordance with the manufacturer's instructions. The Engineer shall inspect each manhole frame chimney seal after installation and before payment is made. There shall be no infiltration, inflow, or other leakage through the manhole frame chimney joint after the frame chimney seals have been installed. If leakage is evident, the manhole frame chimney seal shall be repaired as approved by the Engineer.

Contractor shall guarantee the manhole frame chimney seal for two full years from the date of acceptance by the Engineer to the extent that any defects including, but not limited to, root penetration, signs of infiltration, cracks or excess grouting material, which may appear from faulty workmanship or material furnished by the Contractor shall be repaired. No additional payment will be made for repairing manhole frame chimney seals that fail testing.

The chimney seal shall be applied from a point 2-inches above the joint between the frame and chimney to a depth as required to rehabilitate the chimney. The minimal coverage shall be 12-inches, unless otherwise directed by the Engineer.

I. INSPECTION AND TESTING

1. Quality Assurance and Acceptance:

- a. Four (4) - two-inch test cubes of the liner shall be cast each day or from every pallet of product used, and shall be properly packaged, labeled and sent for compression strength testing per ASTM C-109, to an independent testing

laboratory acceptable to the Engineer and paid for by the Contractor.

- b. After completion of manhole rehabilitation, Contractor shall verify the minimum coating thickness of the manhole liner. The Contractor shall propose a method for measuring the liner thickness. The costs associated with measuring the liner thickness shall be included in the unit bid price. If the thickness of the lining is not uniform or is less than specified, it shall be repaired or replaced at no additional cost to the Authority.
2. After the manhole rehabilitation work has been completed, the manhole shall be visually inspected by the Engineer in the presence of the Contractor and the work shall be found satisfactory to the Engineer. Any work that has been found to be defective shall be redone by the Contractor at no additional expense to the Authority.
3. Approximately 10% of manholes shall be vacuum tested to ensure a watertight installation. Manholes that will be vacuum tested will be selected by the Engineer.
 - a. Testing for water tightness shall be accomplished by vacuum testing in accordance with ASTM C 1244.
 - b. Manholes shall be vacuum tested and shall have a minimum of 8-inches of mercury applied to the manhole. Pressure drop shall not exceed 1 inch of mercury in a 1-minute test.
 - c. If the tested manhole meets the required test pressure and duration, full payment for the manhole will be made. If the time duration measured to drop 1 inch of mercury is less than the required time as noted above, the manhole will have failed the vacuum test, and payment will be reduced as described below.
 - i. If the tested manhole achieves the required initial vacuum pressure but holds the required pressure for less than the required time duration, half payment for the applicable manhole pay item will be made for that manhole.
 - ii. If the tested manhole fails to achieve the initial specified pressure, no payment will be made for the applicable manhole pay item for that manhole.
 - d. Contractor may repair and re-test manholes which fail the vacuum test. If the manhole passes the subsequent vacuum test, the Contractor shall be entitled to the commensurate payment for the manhole Work.
 - e. Written verification of every manhole test must be provided to the Engineer. The following minimum information shall be recorded and provided:
 - i. Manhole Number.
 - ii. Beginning test pressure, end test pressure, and test duration (minimum 60

- seconds).
- iii. Repeat test number.
- iv. Repairs made.

M. CLEAN UP

The Site shall be cleaned on a continuous, daily basis during performance of the work and shall be cleaned upon completion so that the Project Site shall be left in a neat and orderly condition acceptable to the Engineer.

MEASUREMENT AND PAYMENT

This work will be measured for payment by the actual number of vertical linear feet of manhole rehabilitated in accordance with these specifications. Measurement shall be made from the invert of the out flowing pipe to the bottom of the manhole cover and rounded to the nearest whole number of feet. Invert rehabilitation shall be included in this vertical foot unit cost.

This work shall be paid for at the unit price bid per vertical foot for Sanitary Sewer Manhole Rehabilitation completed and accepted, which price shall include all materials, labor, tools, and equipment necessary and incidental to complete the work in accordance with these specifications including plugging holes and under drains, stopping active hydrostatic infiltration, patching, filling and repairing non-infiltrating holes, cracks and breaks, surface preparation, installation and/or application of manhole lining system, installation and/or application of an injection grout system, testing, sealing pipe connections, lift holes, riser joining sections, bench/trough and corbel sections, frames and covers, and cleanup of the site.

No measurement will be made for partially completed manhole rehabilitation.

There will be a separate measurement for payment for the Installation and/or application of a manhole frame chimney seal if requested by the Engineer.

There will be no separate measurement for payment for the cost of temporary bypass pumping, but the cost thereof shall be included in the contract unit price for sanitary sewer manhole rehabilitation.

Maintenance and Protection of Traffic will be measured and paid for in accordance with the provisions of Item 971, "Maintenance and Protection of Traffic." When no price for Item 971, Maintenance and Protection of Traffic, is asked for on the Proposal Form, this work will not be measured for payment, but the cost shall be included in the unit price bid for sanitary sewer manhole rehabilitation.

<u>Item Number</u>	<u>Pay Item</u>	<u>Pay Unit</u>
524.01	Sanitary Sewer Manhole Rehabilitation	Vertical Foot
524.02	Flex Coat Chimney Seal	Each

ITEM 522M SANITARY SEWER TELEVISION INSPECTION

DESCRIPTION:

Under this item, the Contractor shall inspect sanitary sewer interior using color closed-circuit television (CCTV) camera, and document the record of the inspection in DVD format with audio location and date information, video title information, continuous tape counter and provide paper and digital copies of all inspection logs. Work may be performed in conjunction with sanitary sewer cleaning, installation of cured-in-place pipe lining and/or manhole rehabilitation, independently or in conjunction with other sanitary sewer activities.

MATERIALS AND EQUIPMENT:

- A. Television Inspection Camera(s): Equipped with rotating head, capable of ± 275 -degree rotation from horizontal and 360-degree rotation about its centerline.
 - 1. Minimum Camera Resolution: 400 vertical lines and 460 horizontal lines; picture quality and definition shall be to the satisfaction of the Engineer.
 - 2. Camera Lens: Not less than 140 degree viewing angle, with automatic or remote focus and iris controls.
 - 3. Focal Distance: Adjustable through range of 1 inch to infinity.
 - 4. Camera(s) shall be intrinsically safe and operative in 100 percent humidity conditions.
 - 5. Lighting Intensity: Remote-controlled and adjusted to minimize reflective glare.
 - 6. Lighting and Camera Quality: Provide clear, in-focus picture of entire inside periphery of sewer. A reflector in front of the camera may be required to enhance lighting in large diameter pipe.
 - 7. Height adjustment: Use a camera with camera height adjustment so that the camera lens is always centered at one-half the inside diameter, or higher, in the pipe being inspected. Camera height adjustment is particularly necessary on oval/egg shaped brick sewer pipes for the Contractor to be able to inspect as far into the lateral sewer pipe connection as possible.
- B. Footage Counter: Measures distance traveled by camera from the centerline of the starting manhole, accurate to two-tenths of a foot over the entire length of the section being inspected.
- C. Video Titling: Video equipment shall include genlocking capabilities to extent that computer generated data (such as footage, date, and size) as determined by SDR, can be overlaid onto video, and be indicated on television monitor and permanently recorded on inspection videotape.
- D. Recording: All recordings are to be in digital format.

1. Image Capture: Capture color still shots of video recordings for all defects encountered. Digitized picture images shall be stored and be exportable as JPEG formats.
2. Video Capture: Full time live video and audio files shall be captured for each pipe segment and lateral inspected. The files shall be stored in industry standard MPEG format viewable from a DVD on an external personal computer that utilizes Microsoft Media Player, version 9.0 to view the recording. The MPEG video shall be ISO-MPEG Level 1 (MPEG-1) coding with a resolution of 352 pixels (x) by 240 pixels (y) and an encoded frame rate of 24 frames per second. System shall perform an automatic disk image/file naming structure to allow saved video/data sections to be "Burned" to DVDR format. It shall have the capability of "burning" a minimum of 120 minutes of recording to the DVDR media. The video recording shall be free of electrical interference and shall produce a clear and stable image. The audio recording shall be sufficiently free of background and electrical noise as to produce an oral report that is clear and discernable. The digital recordings and inspection data shall be cross-referenced to allow instant access to any point of interest within the digital recording.

CONSTRUCTION DETAILS:

The Contractor shall provide qualified and experienced personnel and all necessary equipment, tools and materials and all incidentals required to perform sanitary Sewer Television Inspection according to the requirements of these specifications.

Inspection shall be performed by a NASSCO Pipeline Assessment Certification Program (PACP) certified operator and shall meet the coding and reporting standards and guidelines as set by PACP. All report annotations, pipe conditions and pipe defects shall be identified properly using PACP codes as defined by PACP, and severity ratings shall be calculated according to PACP.

A. SUBMITTALS

1. Quality Assurance: Submit one example DVD of previous sewer inspection work that shows operational and structural defects in sewers, complete with audio commentary and inspection log(s).
2. DVD and inspection logs will be reviewed to determine if quality of CCTV image is acceptable, and if defects were properly identified and documented according to Authority requirements.
3. Modify equipment and/or inspection procedures to achieve report material of acceptable quality.
4. Do not commence Work prior to approval of report material quality by the Engineer. Upon acceptance, report material shall serve as standard for remaining Work.

5. Maintain copy of all inspection documentation (tapes, databases, and logs) for duration of Work and warranty period.
6. Copies of PACP certificate for inspectors completing the work.
7. Final Submittal: After the inspections have been completed, the Contractor shall submit a DVD containing electronic files of the inspection databases in unmodified NASSCO-PACP Certified Access format, movies, pictures and reports. The Contractor shall submit individual PACP exchange database (.mdb) inspection files (version 2.2 or 4.2) for each of the structures inspected. Each database must be labeled and named using the inspected structure's GNHWPCA identification (ID) number. Databases that merge multiple inspection files will not be accepted. The DVD shall also contain video files in MPEG format of each of the inspected structures and pictures in JPEG format. An inspection report shall be submitted both in electronic and hardcopy form. The report shall include a table of contents listing all the segments inspected with corresponding street names and associated report page number.

B. LEGAL, HEALTH AND SAFETY REQUIREMENTS

The Contractor shall observe all federal, state and local laws, ordinances, policies, practices and regulations. In addition, the Contractor agrees to promptly procure all necessary approvals, licenses and permits, pay all charges and fees, and give all notices necessary and incident to the due and lawful prosecution of the work.

The Contractor shall conduct the work at all times in such a manner as to insure the least possible obstruction to traffic. The convenience of the general public and of the residents along and adjacent to the roadway shall be provided for in an adequate and satisfactory manner as the Engineer may direct.

All equipment and Materials shall be placed or stored in such locations so as not to be or to create the danger of becoming a hazard to the traveling public. No section of road shall be closed to the public except by permission of the Authority.

The safety provisions of applicable laws, building, construction and fire safety codes and the latest edition of the "Construction Safety Code, State of Connecticut, Labor Department", approved by the State Labor Commissioner, shall be complied with at all times.

The Contractor shall perform operations in strict accordance with OSHA and equipment manufacturers' safety requirements. Particular attention is drawn to safety requirements involving entering confined spaces.

C. PROSECUTION OF THE WORK

Sewer Flow Requirements:

1. Minimal visible sewage flow in the sanitary sewers shall be allowed during inspection. If in the opinion of the Engineer, the amount of sewage flow

observed during the television inspection becomes detrimental to the effectiveness of the work, it shall be eliminated by plugging of the sewers in the upstream manhole and/or bypass pumping, if necessary.

2. Plugs for flow control shall be of a design which permits the release of a portion or all of the stored sewage flow in an emergency.
3. Water levels in the manholes upstream of the plugs shall not be allowed to rise to an elevation higher than two (2) feet above the manhole invert. If water levels rise to higher elevations, the plugs shall be removed to release a portion of the stored sewage or bypass pumping shall be utilized. Flows shall be restored to normal after completion of the television inspection.
4. Should Contractor's televising equipment become lodged in any sewer line, it shall be removed by the Contractor at his expense. Contractor shall re-televiser any line segment in which his equipment became lodged after said equipment has been removed to demonstrate to the Authority that no damage exists as a result of his televising operations and the recovery of the equipment.

D. SEQUENCE OF THE WORK

When performed in conjunction with cured-in-place lining, the Contractor shall perform the Work in the following sequence:

1. Clean sewer lines and manholes in accordance with requirements of Item 518, Sanitary Sewer Cleaning.
2. Perform TV inspection to comply with requirements of this specification.
3. Install cured-in-place pipe lining in accordance with requirements of Item 520, Sanitary Sewer Cured-In-Place Pipe Lining.
4. Repeat TV inspection in same direction as previous inspection, after completion of installation of cured-in-place lining.
5. Inspection Requirements
 - a. The entire inspection survey shall be recorded in MPEG format written to a hard drive, thumb drive, or DVD and submitted with digital links to the survey. The documentation of the work shall be consistent with the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment Certification Program (current edition), including CCTV Reports, unmodified PACP database, logs, electronic reports, etc. noting important features encountered during the inspection.
 - b. Audio portion shall be sufficiently free from electrical interference and background noise to provide complete intelligibility of oral report.

- c. Identify each DVD with labels showing Authority's name, Contractor's name, and each manhole-to-manhole pipe segment of sewer line represented on DVD.
 - d. The completed DVD will become the property of the Authority.
6. The speed of travel shall be slow enough to inspect each pipe joint, tee connection, structural deterioration, infiltration and inflow sources, and deposits, but should not, any time, be faster than 30 feet per minute. The camera must be centered in the pipe to provide accurate distance measurements to provide exact locations of important features in the sewer and these footage measurements shall be displayed and documented on the video.
7. Stop at every joint for three seconds and using a pan and tilt view when appropriate and stopping elsewhere when necessary to ensure proper documentation of the sewer's condition. Stop at every lateral connection. Center the camera so that the lighting and the pan and tilt view can be used to inspect as far into the lateral connection as possible. Recording all defects found in the service connection. Where lateral flow is observed, observe flows from service connections for approximately two minutes to ascertain if the flow is sanitary or extraneous flow. The video recording may be paused during observation. Record results of the flow observed on video recording and inspection logs.
8. Obstructions may be encountered during the course of the CCTV inspection that prevent the travel of the camera. In instances when obstructions are not passable, the contractor shall withdraw the equipment and begin a CCTV inspection from the opposite end of the sewer reach.
9. In addition to televising the sewer pipe, all manholes shall be panned with the video camera and visually inspected. A full 360 degree pan of all manholes is required. This video footage shall occur at the beginning of each pipe segment survey inspection from the bottom of the manhole panning up the manhole shaft. The contractor shall cover the manhole opening to prevent too much light from entering the structure and to ensure a clear and focused view of the manhole interior. In instances when the manhole is the terminating manhole then the pan shall occur at the end of the pipe segment survey inspection as well.
10. The Engineer shall have access to observe and monitor operations at all times.
11. Every section of sewer (manhole to manhole) shall be identified by audio and alphanumeric on the video display and shall include: Project title, name of Greater New Haven Water Pollution Control Authority, time of day, map number, manhole to manhole pipe section, pipe material, sewer diameter and length, compass direction of viewing, direction of camera's travel, pipe depth, and operator name.

Important features shall be identified by audio and on PACP log to include all manholes, active and inactive service connections, structural defects, maintenance problems, grease, roots, infiltration, obvious inflow sources, etc. All video must be continuously metered from manhole to manhole.

E. ACCEPTANCE BY THE ENGINEER

Final Acceptance of the work shall be determined by the Engineer based upon the verification that the Sanitary Sewer Television Inspection has been successfully completed in accordance with the following requirements:

1. Maximum depth of flow for CCTV inspections shall be 25% of the pipe diameter. If the depth of flow is greater, then the CCTV inspection shall be performed during the low flow periods between the hours of 10:00 PM to 6:00 AM. If the flow is still above 25% on the return trip, then the contractor can use a flow controlling mechanism to control the flow and proceed with the inspection. If the contractor encounters a surcharging manhole (whereas the flow at the manhole is at least 50% of the sewer pipe diameter), then the contractor shall immediately notify the GNHWPCA emergency number at 203-466-5260.
2. Where television inspection is in preparation for the installation of cured-in-place pipe lining, the television inspection shall be in accordance with these specifications and the requirements of Item 520, Sanitary Sewer Cured-in-Place Pipe Lining.
3. Where television inspection is in preparation for manhole rehabilitation, the television inspection shall be in accordance with these specifications and the requirements of Item 524, Sanitary Sewer Manhole Rehabilitation.

If the Engineer determines that the television inspection has not been completed in accordance with the requirements, the Contractor shall repeat the television inspection process until final acceptance is obtained.

F. CLEAN UP

The Site shall be cleaned on a continuous, daily basis during performance of the work and shall be cleaned upon completion so that the Project Site shall be left in a neat and orderly condition acceptable to the Engineer.

MEASUREMENT AND PAYMENT:

This work will be measured for payment by the actual number of linear feet of the size and type of sanitary sewer television inspections, measured along the centerline of the sanitary sewer from the center of the manhole to the center of the manhole.

This work shall be paid for at the contract unit price per linear foot of "Sanitary Sewer Television Inspection (Size) (Type), actually completed, which price shall include all

materials, labor, tools, and equipment incidental and necessary for the television inspection.

For Television Inspection in connection with the installation of Sanitary Sewer Cured-In-Place Pipe Lining, the work will be measured for payment by the actual number of linear feet, measured along the centerline of the sanitary sewer from the center of the manhole to the center of the manhole. The actual number of linear feet of the sanitary sewer lined with cured-in-place pipe lining shall only be measured and paid for once and the unit price bid shall include the cost of the pre-insertion and post-insertion television inspections as well as the final television inspection performed at the completion of the three-year guarantee period.

There will be no measurement for payment for the cost of television inspection of manholes, but the cost thereof shall be included in the contract unit price per linear foot for the size and type of sanitary sewer television inspection.

<u>Item Number</u>	<u>Pay Item</u>	<u>Pay Unit</u>
522	Sanitary Sewer Television Inspection (Size) (Type)	Linear Foot