

ARTICLE 3 — DETAILED SPECIFICATIONS

Rock River Water Reclamation District Rockford, Illinois

Sewer Service Lateral Lining 2007-2008 Capital Project No. 0811

B.R. 3:1 General

It is the intent of these specifications to provide the description necessary to allow qualified bidders to submit formal quotations to the Rock River Water Reclamation District (District) for the **Sewer Service Lateral Lining 2007-2008 Capital Project No. 0811**. These Detailed Specifications are to provide for the rehabilitation of existing sanitary sewer service laterals from the sewer main to the property line by lining the existing service with a resin-impregnated flexible felt tube heated to cure the thermosetting resin/felt tube composite, formed to the existing service lateral. All service lateral lining will be on services that connect to mainline sewers that have been previously lined with cured in place pipe (C.I.P.P.) or fold and formed HDPE pipe (U-Liner). Service lateral rehabilitation shall be completed without excavation in the public roadway.

All services to be lined have been cleaned by the District using a high pressure cleaner in 2006-2007. Service Cleanouts are buried 1.0' below grade and have ½" iron pins strapped to the side to locate with a metal detector. Service ties from the cleanout to the property line are provided in Section III. The District will assist in locating cleanouts if required

The cured-in-place lateral liner pipe shall be installed into the existing 6" dia. service lateral consistent with ASTM F-1216 or F-1743 through the clean-out/access point at the property line or from the mainline pipe. The resin and tube shall be held in place using internal pressure and cured into a hard impermeable pipe. When cured, the pipe shall be a continuous, tight-fitting pipe-within-a-pipe. The rehabilitation shall provide a watertight connection at the mainline pipe and at the existing clay to PVC pipe transition. The lateral liner shall extend from the sewer main to a minimum of 1' upstream of the 6" Clay to 6" PVC pipe transition – reference the Detail in Section VI.

B.R. 3:2 Scope of Work

This article contains Detailed Specifications relating to proposal items. The work to be done under each item is discussed along with units for payment and measurement for payment. However, the descriptions given do not necessarily outline all the work to be done under any item. The materials and workmanship provided for this project shall meet or exceed the Detailed Specifications found in this Section, the Rock River Water Reclamation District *General Provisions and Technical Specifications for Sanitary Sewer Construction* and the *Recommended Specifications for Sewer Collection System Rehabilitation*, latest edition, as published by the National Association of Sewer Service Companies. In the case of contradictions between the Detailed Specifications and the Technical Specifications, the Detailed Specifications shall govern. In addition, the materials and workmanship provided for this project shall meet or exceed the Detailed Specifications in this section and shall conform to the following specifications:

1. Standard Specifications for Water and Sewer Main Construction in Illinois, 5th Edition; May, 1996, as published by the Associated General Contractors of Illinois, the Illinois Municipal League, the Illinois Society of Professional Engineers and the Underground Contractors Association.
2. General Provisions and Technical Specifications for Sanitary Sewer Construction, Revised October 24, 1983, by the Rock River Water Reclamation District.
3. Recommended Specifications for Sewer Collection System Rehabilitation, as published by the National Association of Sewer Service Companies, latest edition.
4. Standard Specifications for Road and Bridge Construction, Illinois Department of Transportation, current edition.
5. American Society for Testing and Materials (ASTM):
 - a. ASTM D 543 Test Method for Resistance of Plastics to Chemical Reagents
 - b. ASTM D 638 Test Method for Tensile Properties of Plastics
 - c. ASTM D 790 Test Method for Tensile Properties of Non-reinforced and Reinforced Plastics and Electrical Insulating Materials
 - d. ASTM F 1216 Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube
 - e. ASTM F 1743 Standard Practice for Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place Installation of Cured-in-Place Resin Pipe

Bidder shall provide the District with a copy of all the applicable specifications listed for the materials to be used.

In case of apparent contradictions between the Detailed Specifications and the Technical Specifications, these Detailed Specifications shall govern.

The Contractor shall be responsible for the pipe lining of sanitary services, complete restoration, all necessary permits and fees, mobilization, securing of access, flow control (bypass pumping), water acquisition, site preparation, site investigation, traffic control, public notification and all other appurtenances required for completing the project in total compliance with the specifications.

The Contractor shall perform all operations in strict accordance with all OSHA and manufacturer's safety requirements. Particular attention is drawn to those safety requirements that involve working with scaffolding, entering confined spaces and operations with hot water. The District assumes no responsibility for enforcement of safety standards.

Excavated or other materials shall not be stored or cast upon the pavement. The Contractor shall transport any materials cleaned from the sewer to an approved dumping area. The Contractor shall clean up work areas at the end of each day by sweeping, washing or other approved methods. When the work is halted by rain, the Contractor shall clean up the work areas before leaving the site.

The Contractor shall provide the District with a construction schedule prior to performing any work. Any work that is performed by the Contractor without the District's permission or not in the presence of a Rock River Water Reclamation District inspector may, at the District's sole discretion, be rejected.

The Contractor shall notify the Rock River Water Reclamation District 48 hours prior to beginning any work to have an inspector present during all construction. Any construction not supervised by a District inspector shall not be accepted. The Contractor shall notify the District 24 hours prior to working on a weekend or a District holiday. The Contractor will not be permitted to work on the following District holidays: Memorial Day (May 30), Independence Day (July 4), Labor Day (Sept. 5), Thanksgiving Day (Nov. 24), Christmas Day (Dec. 25) , and New Year's Day (Jan. 1, 2)

The Contractor shall be responsible for securing any other necessary permits, and for securing all bonds, insurance, etc., paying all fees and meeting all conditions required by any and all permits at no extra cost to the District. Copies of all Contractor-secured permits shall be provided to the District Engineer prior to the start of construction.

The Contractor shall notify the local roadway authority 72 hours prior to beginning any roadway removal or restoration work on public rights-of-way for permission and requirements for restoration of disturbed areas within limits of their control. All roadway removal and restoration shall be inspected and approved by the governing municipality.

The Contractor shall be responsible for all tests of materials and final installation required by the Rock River Water Reclamation District. All deficiencies noted by the inspectors shall be corrected by the Contractor without cost to the District and prior to final payment.

It shall be the Contractor's responsibility to secure any temporary or permanent access, storage or construction easements from property(ies) which he deems necessary to perform the work as defined in the specifications. The cost of gaining these easements shall be considered incidental to project.

All work in streets, highways, or flood plains shall be subject to the regulations and requirements of the appropriate agencies. Should conflicts or contradictions arise between the specifications and the roadway, railroad or waterway permits, the permits shall govern. The Contractor, upon completion of work, shall restore the area as required by the appropriate agency. The Contractor shall be responsible for the temporary maintenance of all roadways, drainage facilities and drives over the course of this project and shall maintain access at all times.

If excavation is required, the Contractor shall notify all utility companies prior to beginning any work. All underground utilities shall be located by the utility involved and special care shall be taken when excavating near underground utilities to avoid damage. Forty-eight (48) hours prior to starting construction, the Contractor shall call JULIE at 1-800-892-0123 for utility locations at site.

The District will be responsible for installing a 6" diameter cleanout on the existing 6" Clay sewer service at or near the property line for all laterals. The cleanout will connect to the existing service using a 6" x 6" x 6" wye fitting and a 6" VCP x 6" PVC transition coupling. Typically the District-provided cleanout will be located 2-4' upstream of the 6" Clay to 6" PVC

pipe transition. The Contractor will be responsible for lining the entire length of existing 6" Clay pipe and the 6" PVC pipe 1' upstream of the 6" Clay to 6" PVC transition. Reference the Detail in Section VI. All service lateral lining will be on services that connect to mainline sewers that have been lined with cured in place pipe (C.I.P.P.) or fold and formed HDPE pipe (U-Liner). All services to be lined were cleaned by the District using a high pressure cleaner in 2006-2007.

B.R. 3:3 Cured-In-Place Pipe Lateral Reconstruction

B.R. 3:3.1 General

It is the intent of the specification to provide for the reconstruction of service lateral pipes from the sewer main to the property line, without excavation, by the installation of a resin impregnated, flexible tube. The cured-in-place pipe shall be installed into the existing service lateral consistent with ASTM F-1216 or F-1743 through a 6" diameter clean-out at the property line or from the mainline pipe. The resin and tube shall be held in place using internal pressure and cured into a hard impermeable pipe. When cured, the pipe shall be a continuous, tight-fitting pipe-within-a-pipe. The rehabilitation shall provide a watertight connection at the mainline pipe.

The cured-in-place pipe shall be fabricated from materials which when cured will be chemically resistant to withstand internal exposure to domestic sewage, and meet the chemical corrosion resistance requirements of ASTM F-1216 and D-5813. All constituent materials will be suitable for service in the environment intended. The final product will not deteriorate, corrode or lose structural strength to reduce the projected product life.

B.R. 3:3.2 CURED-IN-PLACE PIPE MATERIALS

The tube shall be fabricated to a size that, when installed, provides a cured-in-place pipe that will neatly fit the internal circumference of the existing service. **Note: The Contractor shall be responsible for verifying the length, diameter and condition of the existing service.**

B.R. 3:3.3 Cured-In-Place Pipe (CIPP) Material Specifications

1. **Tube:** The tube material shall meet the requirements of ASTM F 1216 or ASTM F 1743, Section 5.1.
 - (a) **Absorbent Fabric Tube:** The tube shall consist of one or more layers of absorbent fabric capable of carrying resin, and capable of withstanding installation pressures and curing temperatures. The tube shall be compatible with the resin system used. The tube material shall be able to stretch to fit irregular pipe sections and negotiate bends. The tube shall be fabricated to a size that when installed, will fit the internal circumference and the length of the pipe.

Allowance should be made for circumferential stretch during inversion. For the pull-in methods of lining, the resin soaked tube shall have an outer plastic lining that effectively prevents the scrape off or wash off of resin.

- (b) **Thickness:** The liner shall be designed in accordance with ASTM F-1216. The finished tube shall have a uniform thickness and shall not vary from the nominal minimum tube thickness by more than 5%.

The minimum liner thickness for this project shall be 3.0 mm unless design calculations per B.R. 3:3.4 demonstrate a thinner liner would be acceptable.

- (c) **Color:** The tube shall be a light reflective color so that a clear, detailed examination with closed circuit television equipment may be made.
- (d) **Delaminations:** The bond between all CIPP layers shall be strong and uniform. All layers, after cure, must form one homogeneous structural pipe wall with no part of the tube left unsaturated by resin. It shall not be possible to separate any two layers with a probe or point of a knife blade so that the layers separate cleanly or the probe or knife blade moves freely between the layers; nor shall separation of the layers occur during testing performed under the requirements of these Detailed Specifications.

2. **Resin:** The resin system shall be thermoset polyester (or District approved alternate) resin meeting the requirements of ASTM F-1216 or ASTM F-1743, Section 5.2.

- (a) The manufacturer shall certify that the proposed resin system and cure schedule are appropriate for the proposed application, and have been tested in laboratory and field conditions. The resin shall produce CIPP, which will comply with the structural and chemical resistance requirements specified.
- (b) The resin used shall be compatible with the tube and be able to cure in the presence of water. Thixotropic agents that enable the resin system to possess pseudo-plastic fluid flow properties, and that do not interfere with visual inspection, shall be added for viscosity control and to minimize resin washout. Resins may contain pigments that do not interfere with visual inspection of, or the physical testing of, the CIPP. Filler materials of a proprietary nature may be added as long as the final pipe product can meet or exceed the minimum standards set forth in this specification.

3. **Deviations:** The Contractor shall submit his price proposal for the appropriate length, size and thickness designated or required. No changes in prices will be entertained by the District as a result of the Contractor modifying the properties of the liner due to unexpected parent pipe conditions.

Note: The Contractor shall be responsible for field verifying the inside diameters of all services to be lined.

B.R. 3:3.4 Cured-In-Place Pipe (CIPP) Structural Requirements

1. The CIP pipe shall be designed in accordance with the requirements of ASTM F 1216, Appendix XI, with the following design parameters. Design calculations shall be submitted to the District for approval prior to lining.

Design safety factor: 2.0

Reduction factor for long-term effects: 0.50 (applied to flexural modulus).

Ovality: 2% min.

Enhancement factor (K): 7

Groundwater depth: To grade

Soil Depth (above crown): To grade

Soil Modulus: 1000 psi

Soil density: 120 pcf

Live load: 0

Design condition: Fully deteriorated

B.R. 3:3.5 PHYSICAL STRENGTH:

The structural performance of the finished pipe must be able to accommodate all anticipated loads throughout the design life of the cured-in-place pipe. No cured-in-place pipe reconstruction technology will be allowed that requires bonding to the existing pipe for any part of its structural strength. If reinforcing materials (fiberglass, etc.) are used, those materials must be corrosion-resistant grade materials and be fully encapsulated within the resin to assure that the reinforcement is not compromised when exposed to the sewage.

The cured-in-place pipe shall conform to the minimum structural standards as listed below:

<u>PROPERTY</u>	<u>ASTM STANDARD</u>	<u>RESULTS</u>
Flexural Strength	ASTM D-790	4,500 PSI
Flexural Modulus of Elasticity	ASTM D-790	250,000 PSI

B.R. 3:3.6 INSTALLATION PREPARATIONS:

The following installation procedures shall be adhered to unless otherwise approved by the District.

Access – The District shall provide a cleanout at or beyond the termination point of the length of public service lateral to be rehabilitated. This will allow for the passage of the required cleaning and video equipment. The cleanout will be comprised of a 6” diameter PVC riser with a wye fitting on the existing 6” VCP sewer service per the Detail in Section VI.

Safety – The installer shall carry out his operations in accordance with all applicable OSHA standards. Particular attention is drawn to those safety requirements involving entrance into confined spaces.

Notification – Provide notification in accordance with B.R. 3:7.

Cleaning - Internal debris must be removed from the service lateral and main line at point of connection before installing the lateral lining system. Reference B.R. 3:4.

Inspection of the existing pipe –Service inspection shall be performed by experienced personnel trained in closed circuit television systems. The interior of the pipeline shall be carefully inspected to determine the location of any condition which may prevent proper installation of the lateral lining system. Reference B.R. 3:6. If the Contractor determines that he cannot line a service due to conditions encountered, he shall indicate this in writing to the District and if the District concurs with the determination, the Service will be removed from the contract. A service of the same length and proximity may be substituted in place of the service removed.

Bypassing Sewage – Contractor shall be responsible for sewer flow control per B.R. 3:5. Temporary plugging and bypassing of sewage around the section or sections of mainline pipe where the service lateral(s) is/are located may be required. It is required that the service lateral be inactive during the time of liner installation. This may be accomplished by requesting that the homeowner refrain from using their services during the period of installation. This notification shall be offered to the homeowner at least 24-hours prior to starting their lateral repair. The Contractor shall be responsible for maintaining the current level of service to all users connected to the existing sanitary sewer and shall be responsible for all damage caused by sewer backups as a result of this project.

Line Obstructions – If the inspection of the service lateral reveals an obstruction that cannot be removed using conventional sewer cleaning equipment, the obstruction shall be removed or repaired by the District or the lateral liner removed from the Contract.

Mainline Connection - The service lateral pipe opening at the confluence with the mainline sewer should be prepared in a manner that is consistent with ASTM F-1743, Section 6.9. The connection of the service to the mainline sewer must be watertight. If the service reinstatement in the existing C.I.P.P. or fold and formed liner, has rough or jagged edges or is not full open, the Contractor shall modify (re-cut or brush) the service opening per B.R. 3:19.

B.R. 3:3.6.1 Preparation of Liner

- a. Material shall conform with manufacturer's standards to provide lining thickness specified and inspected prior to impregnation.
- b. Wet Out: The tube shall be impregnated with resin under controlled conditions. The volume of resin used should be sufficient to fill all voids in the tube material at nominal thickness and diameter. A roller system shall be used to uniformly distribute the resin throughout the tube. All air in the tube

shall be removed by vacuum, allowing the resin to thoroughly impregnate the tube. Should an unsaturated section of the tube be noticed before inversion, the unsaturated area of the tube shall be re-impregnated with the resin using methods developed by the Contractor and to the satisfaction of the District.

B.R. 3:3.7 INSTALLATION OF THE LATERAL LINING SYSTEM

Installation shall take place by one or both of the following installation methods:

1.) Install service liner through Sanitary Sewer Main: A pressure apparatus, with an end attached to a robotic device, shall be hand-winchd through the mainline pipe to the service connection. The robotic device, together with a television camera, shall be used to position the pressure apparatus installation hardware at the service connection opening. Air pressure shall be used to install the wet-out tube into the lateral pipe.

2.) Install service liner through existing cleanout: A pressure apparatus shall be pulled into place through the cleanout. Air pressure shall be used to install the wet-out tube into the lateral pipe.

Non-toxic lubricant may be used to reduce friction. The inversion / installation process shall be conducted at a maximum controlled speed of two feet per second (2 ft. /sec.).

Pressure: Tube installation forces or pressures shall be limited so as not to stretch the tube longitudinally by more than 5% of the original length. Before installation begins, the tube manufacturer shall determine the minimum pressure required to hold the tube tight against the host pipe and the maximum allowable pressure so as not to over stretch or damage the tube. Once the installation has started, the pressure shall be maintained between the minimum and the maximum pressures until the installation has been completed.

The Contractor shall be responsible for coordinating with the appropriate water authority for the availability of public water for this project. If public water is not directly available at specific sites, the Contractor shall be responsible for delivery of water to the site. The Contractor shall be responsible for any fees charged for water usage. If required, the Contractor shall obtain a calibrated water meter from the Water Department to gauge usage of water. **Contact: City of Rockford Water Deptment: Tom Garson (815) 987-5729**

Curing - Curing shall take place per the manufacturer's recommendations.

Finish - The finished cured-in-place pipe shall be free of dry spots, lifts, wrinkles or delamination. The cured-in-place pipe shall not inhibit the closed circuit television post video inspection of the mainline or service lateral pipes.

Final Acceptance: Upon completion, the contractor shall televise the lined lateral and provide a disk) showing the installed liner to the owner. Reference B.R. 3:6 for televising requirements. Upon completion of service lining, District crews will televise the Sewer Main to verify acceptance of the Sewer Service Connection at the Main. All main/service connections shall be watertight and flush with the existing liner.

B.R. 3:3.8 Payment

Payment for Cured-in-Place Pipe Lateral Reconstruction shall be made based on the contract unit price bid for each Cured-in-Place Pipe Lateral Reconstruction. No payment will be made for service lining until the District has reviewed and approved the post-lining recording.

B.R. 3:4 Sewer Cleaning

B.R. 3:4.1 General

The Contractor shall be responsible for cleaning and removing foreign materials from the sewer lines to permit proper installation of the pipe lining materials. The sewer line cleaning shall be accomplished by using hydraulically propelled, high-velocity jet, or mechanically powered equipment. Selection of the equipment shall be the responsibility of the Contractor and shall be approved by the District prior to starting any of the work. All services to be lined were cleaned by the District using a high pressure cleaner in 2006-2007.

All sewer cleaning shall be done in accordance with Section 3 of the Recommended Specifications for Sewer Collection System Rehabilitation, as published by the National Association of Sewer Service Companies, latest edition.

The cleaning procedure shall remove all dirt, grease, rocks, roots, sand, and any other material or obstructions from the sewer lines that would affect the proper installation of the sewer liner. Any sewer service segment that cannot be properly cleaned because of a broken pipe or a major blockage shall be pointed out to the District. If the District cannot make the necessary modifications to the sewer service to allow for lining, the service will be deleted from the Contract.

Cleaning Precautions

The Contractor shall take all necessary precautions in the use of cleaning equipment to prevent flooding or damage to any of the sewer lines, services, manholes and public or private property. To ensure safe operation, all machines shall be fully enclosed and shall have an automatic overload clutch or relief valve.

When hydraulically propelled cleaning tools or tools which retard the flow in the sewer line are used, precautions shall be taken to insure that the water pressure created does not damage the existing pipe or cause flooding of public or private property being served by the sewer.

Water and Electricity

Electricity: Any electricity required shall be the responsibility of the Contractor.

Water: The Contractor shall be responsible for coordinating with the appropriate water authority for the availability of public water for this project. If public water is not directly available at specific sites, the Contractor shall be responsible for delivery of water to the site. The Contractor shall be responsible for any fees charged for water usage. If required the Contractor shall obtain a calibrated water meter from the Water Department to gauge usage of water. The Contractor shall notify the District prior to initiating cleaning and flushing. **Contact: City of Rockford Water Deptment: Tom Garson (815) 987-5729**

Solids Disposal

All foreign materials cleaned from the sewers shall be removed at the downstream manhole for the section of sewer being cleaned. The Contractor shall not be allowed to pass foreign materials into other pipe sections. **Debris removed from sewers during cleaning may be deposited at the District's dump pad, located at 3333 Kishwaukee St, Rockford, IL, at no cost to the Contractor.** All materials shall be removed from the project site and properly disposed of by the Contractor no less often than at the end of each workday. Under No circumstances will the Contractor be allowed to accumulate debris, etc., on the site of work beyond the stated time, except in totally enclosed containers and as approved by the District.

Acceptance of Sewer Line Cleaning

The Contractor shall televise all sewer services after they are cleaned and verify that the service is clean enough to line. If television inspection shows the cleaning to be unsatisfactory, the Contractor shall re-clean and re-televise the sewer line until it is acceptable to the District. No additional compensation will be awarded for re-cleaning or re-televising of sewers.

Equipment Recovery

If any equipment becomes stuck in the sewer line such that excavation is required for removal, the Contractor shall be responsible for the cost of work necessary, including but not limited to excavation, backfill, restoration, pipe repair and damage resulting from the backup of sewage in the pipe.

B.R. 3:4.2 Payment

Payment for Sewer Cleaning shall be made based on the contract unit price bid for each Service Lateral Cleaned and Televised.

B.R. 3:5 Sewer Flow Control

B.R. 3:5.1 General

The Contractor shall be responsible for controlling the flow in the sewers so that the liner can be installed properly and to allow for proper televising of the lines. The depth of flow in the mainline shall not exceed 20% of the pipe diameter while televising the line. If required, the Contractor shall be allowed to reduce or eliminate the amount of flow by plugging or blocking an upstream line, or by pumping the flow at the upstream manhole into another sanitary sewer manhole. All plugs or blocking shall be restrained to ensure that they cannot be washed downstream.

It is required that the service lateral be inactive during the time of service liner installation. This may be accomplished by requesting that the homeowner refrain from using their services during the period of installation.

All sewer flow control shall be done in accordance with Section 4 of the Recommended Specifications for Sewer Collection System Rehabilitation, as published by the National Association of Sewer Service Companies, latest edition.

Temporary Plugging: The Contractor shall insert an acceptable sewer line plug into the mainline upstream of the section being worked. The plug shall be so designed that all or any portion of the sewage can be released. During TV inspection and cleaning operations, flow shall

be reduced to within the limits specified above. Contractor shall remove the plug well in advance of any possible sewage bypass or basement flooding. After the work has been completed, flow shall be restored to normal.

Diversion/Bypass Pumping: When diversion pumping is required, the Contractor shall supply the pumps, conduits, and other equipment to divert the flow of sewage around the manhole section in which work is to be performed. The diversion system shall be of sufficient capacity to handle existing flow plus additional flow that may occur during a rainstorm. The Contractor will be responsible for furnishing the necessary labor and supervision to set up and operate the diversion pumping system.

The Contractor shall only pump flow into manholes as approved by the District. The Contractor shall provide sufficient inspection personnel to ensure that surcharging and backups do not occur on public or private property while pumping or plugging operations are being conducted. If bypass pumping is required on a 24-hour basis, the pumping equipment shall be equipped with mufflers to minimize noise to a level of 90 decibels or less.

Contractor shall be required to obtain permission from private property owners if it is necessary to string pipes or hoses on said property.

Flooding Precautions: When flow in a sewer line is plugged, blocked, or diverted, the Contractor shall take sufficient precautions to protect the sewer lines from damage that might result from sewer surcharging, and to insure that sewer flow control operations do not cause flooding or damage to the public or private property being served by the sewer involved.

The Contractor shall be responsible and liable for any damage caused by sewer back-ups.

B.R. 3:5.2 Payment

Payment for Sewer Flow Control shall be included in the contract unit price bid for each Cured-in-Place Pipe Lateral Reconstruction.

B.R. 3:6 Television Inspection

B.R. 3:6.1 General

The Contractor shall be required to televise and document all service line conditions after cleaning the service but prior to installing the service liner. Final televising of the service and recording will be required after the liner is installed. The District will review the recordings for final acceptance of the lining process. All televising shall be performed by experienced technicians.

All sewer televising shall be done in accordance with Section 5 of the Recommended Specifications for Sewer Collection System Rehabilitation, as published by the National Association of Sewer Service Companies, latest edition.

The Contractor shall also provide equipment to play back the recordings in the field as requested by the District; the minimum monitor size shall be 17 inches. The equipment shall play back at the same speed that it was recorded, and shall have a slow-motion or stop-action feature.

Prior to installing the liner, the interior of the service line shall be carefully inspected to verify the inside diameter and to determine the locations of any conditions that would prevent the proper installation of the sewer liner.

BR 3:6.2 TELEVISION EQUIPMENT

All televising equipment utilized for television inspection of service lateral pipes by the Contractor shall conform to the minimum standards established herein.

Equipment Scope: Television equipment shall include a pan and tilt television camera, a push rod wide angle service camera, television monitor, cables, power source, lights, skids, and other required equipment. The television camera shall be specifically designed and constructed for operation in connection with sewer inspection.

Camera Specifications: The camera, television monitor, and other components of the video system shall be capable of producing a minimum 600 line resolution color video picture. The camera shall be rated at three LUX or less. The camera shall be operative in 100 percent humidity conditions. Lighting for the camera shall be supplied by a lamp on the camera and will minimize reflective glare. Lighting and camera quality shall be suitable to provide a clear, in-focus picture of the entire inside periphery of the sewer pipe for all conditions encountered during the work. Focal distance shall be adjustable through a range of 6 inches to infinity. Picture quality and definition shall be to the satisfaction of the District.

The camera used to televise the service connection at the sewer main shall be of the rotating pan and tilt type capable of spanning 360 degrees circumference and 270 degrees on the horizontal axis. The camera used for televising the sewer service shall be a push service camera. Markings shall be made on the push camera cable to measure distance and distances verified above ground with a tape.

Recording Requirements: All sewer televising shall be documented on digital media, CD-ROM compact disk-Read Only Memory. The recording shall include information that accurately reproduces the original picture of the video inspection. The recording shall be free of electrical interference and shall produce a clear and stable image.

The pipeline inspection shall consist of identifying a location both within the pipe segment (physical location) and within the recording (video frame location) for each observation. This will allow the recording and inspection data to be cross-referenced for instant access to any point of interest within the recording.

Continuous measurements along service lines shall be electronically or manually recorded for purposes of referencing locations of pipe defects. The date and service address or Item number shall be continuously displayed on the recording header.

Audio Recording Requirements: Not required.

Labeling and Ownership: The disk and its storage case shall be labeled with the Item Number and Service Address to identify the tape contents and a copy of each disk and case shall be delivered to the District for permanent record. All recordings shall be made on new disks and shall become the property of the District. The cost of providing the disks shall be incidental to the sewer lining.

Electrical Power: The electricity for all operations will be the responsibility of the Contractor.

B.R. 3:6.3 TV INSPECTION AND DATA COLLECTION PRACTICES

All inspection taping and recording practices shall conform to the minimum standards specified herein and all tape and inspection form recordings shall be evaluated against these standards.

Color: All recordings shall be in color with the ability to achieve proper balance of tint and brightness. The loss of color or severe redness due to equipment malfunction and black and white pictures irrespective of quality may be cause for rejection.

Focus: All pictures (recordings) shall be in focus, properly illuminated with good contrast and without interference.

Cleaning: Prior to televising, all lines shall be cleaned by the Contractor by one of the above mentioned cleaning procedures or as directed by the District. All obstructions that restrict the flow, prevent cleaning, or televising should be reported to the District immediately.

Maximum Flow Depth: If possible, televising shall be performed while the line segments are in service without plugging or flow diversion.

Observation of Service Connections at the Main: For the District to properly assess service connections at the main the Contractor shall rotate and radially view all service connections including any seams or joints between the new liner and existing liner in the main. The camera shall be repositioned, if necessary, in order to ensure a clear, distinct view of the service connection. Mainline connection recordings are to be made such that the water depth is no greater than 20 percent of the pipe diameter.

Camera Movement: The camera shall move through the line at a uniform rate, stopping when necessary to ensure proper documentation of the sewer's condition but in no case shall the television camera be pulled at a speed greater than 30 feet per minute. Manual winches, power winches, tractor assembly's, TV cable, and powered rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line.

Lens Cleaning: The camera lens must be kept clean and clear. Any fogging due to oil, grease, or other wastewater content or debris that obscures the lens shall be cleaned off before proceeding with the recording operations.

Sewer Length Accuracy: Measurements shall be accurate to +/- 1.0 feet over the length of the section being inspected. Distance marks shall be made on the push camera and all measurements verified above ground with a walking meter, roll-a-tape, or other suitable device.

Equipment Recovery: If any equipment becomes stuck in the sewer line such that excavation is required, the Contractor shall be responsible for the cost of all work necessary, including but not limited to: replacement, excavation and backfill, restoration, pipe repair, and damage due to back-up of the wastewater.

DIGITAL RECORDING REVIEW

The Contractor shall be required to provide to the District digital recordings (1 copy) of all sewer services before and after rehabilitation with visual records of all services and problem areas provided in a format that is compatible with the District's equipment. **Disks shall be edited / formatted such that the post-lining follows pre-lining for each service.** A complete recording shall be made of each service televised as well as the service connection at the sewer main. Boxes and disks shall have printed labels with index, location information, date, Contractor name, project name, Item Numbers and other descriptive information.

All recordings submitted by the Contractor to the District shall be subject to review for acceptability of quality conforming to the minimum standards established herein.

Unacceptable Inspection: If recording/taping any portion of a line is unacceptable, the entire segment will be deemed unacceptable and must be re-televised from the main to the property line.

Complete Service Line Segments: All services must be televised complete from the sewer main to property line on the same recording in a continuous run. Partial recording on one disk and then completing the run on another disk will be unacceptable.

B.R. 3:6.5 Payment

Payment for the final Television Inspection of the lined service shall be included in the contract unit price bid for each Cured-in-Place Pipe Lateral Reconstruction. Payment for initial television inspection of the service shall be made at the unit price bid for each Service Lateral Cleaned and Televised.

B.R. 3:7 NOTIFICATION

B.R. 3:7.1 General

The Contractor shall make every effort to maintain the current level of sanitary sewer service usage throughout the duration of the project. Property owners shall not be without sewer service for more than 8 hours. A public notification program shall be implemented, and shall as a minimum, require the Contractor to be responsible for contacting each home or business connected to the service lateral and informing them of the work to be conducted and when the sewer will be out of service.

Adjustment to the lining schedule shall be made to accommodate property owners as necessary. The Contractor shall also provide the following:

- (a) A minimum of 48 hours advance written notice to be delivered to each home or business describing the work, schedule, how it affects them, and a toll free or local telephone number of the Contractor they can call to discuss the project or any problems, which could arise.
- (b) Personal contact or written notice the day prior to the beginning of work being conducted on the section relative to the residents affected.
- (c) Personal contact with any home or business that cannot be reconnected within the time stated in the written notice.

B.R. 3:7.2 Payment

Payment for notification shall be included in the contract unit price bid for each Cured-in-Place Pipe Lateral Reconstruction.

B.R. 3:8 Testing Requirements and Submittals Required Prior to Installation

Contractor shall furnish data supporting the following:

B.R. 3:8.1 Chemical Resistance

The CIP pipe shall meet the chemical resistance requirements of ASTM F-1216, Appendix X2. Test data from CIP pipe samples similar to that proposed for actual construction shall be submitted prior to installation.

B.R. 3:8.2 Structural Property Testing

To verify past performance, the manufacturer shall submit independent laboratory test results from the same liner materials proposed for the actual installation. These test results must verify that the structural properties specified under B.R. 3:3.5 have been achieved in previous similar field applications.

Samples shall be prepared and tested in accordance with ASTM F-1216. Copies of certified test reports by an approved testing laboratory shall be provided to the District.

Flexural (Bending) Properties: The Flexural Modulus of Elasticity and Flexural Strength shall be measured for gravity pipe applications in accordance with Test Method D-790, Test Method #1 - Procedure A.

B.R. 3:8.3 Material and Curing Details

The Contractor shall provide submittals on all lining materials and resins, and shall furnish manufacturer certification that the liner materials are in compliance with the specifications, codes, and standards referenced herein. The submittals shall include details of all component materials and construction details including complete manufacturers recommendations for storage procedures and temperature control (step curing temperature/hours at each and final stage for each section thickness and length), handling, inserting the liner, and curing details.

B.R. 3:8.4 Design Guide Submittal

Contractor shall submit the Engineering Design Guide and Quality Control procedures for the liner manufacture and installation, including detailed inspection, testing of physical properties, retention of production samples, and taking of field samples.

B.R. 3:8.5 Training Certification

Contractor shall submit evidence of installer training, testing and / or certification of being trained to install the product by the Manufacturer for the product.

B.R. 3:8.6 Payment

Payment for Testing and Submittals shall be included in the contract unit price bid for each Cured-in-Place Pipe Lateral Reconstruction.

B.R. 3:9 Quality Assurance

B.R. 3:9.1 General

The Contractor shall televise all service liners after installation of the liner. The television recording shall be used by the District to perform final inspection on the line. The finished pipe liner shall be continuous from the sewer main to the property line and shall be free from visual defects such as foreign inclusions, dry spots, pinholes, pilot holes and de-lamination. The lining shall be impervious and free of any leakage between the pipe and the surrounding ground, as well as any leakage at the connection to the sewer main.

Upon completion of service lining, the District will televise the Sewer Main to verify the acceptance of the Sewer Service Connection at the Main.

The Contractor shall repair, at his own expense, any defects in the liner that will affect the integrity or strength of the pipe and any visual or functional defects such as wrinkles, drill holes, folds, pillows, etc. All repairs will be performed in a manner that is mutually agreed upon by the District and the Contractor. If a liner fails and is determined to be unacceptable by the District the entire length of lined pipe from the main to the property line shall be removed and replaced per District requirements, cost incidental.

Wrinkles: Any wrinkles in the finished liner pipe that are larger than 5% of the pipe diameter and located in the bottom half of the service are unacceptable and shall be removed and repaired by the Contractor at the Contractor's expense; method to be approved by the District.

Annular void: If an annular void exists, Contractor shall either devise a method to grout the void to the satisfaction of the District or repair or replace that section of pipe at the Contractor's expense. Methods of repair shall be proposed by the Contractor and submitted to the District for review.

Post-Lining Televising: Visual inspection of the CIP pipe shall be in accordance with ASTM F-1216, Section 8.6., and B.R. 3:7 of these specifications.

B.R. 3:9.3 Payment

Payment for Quality Assurance shall be included in the contract unit price bid for each Cured-in-Place Pipe Lateral Reconstruction.

B.R. 3:10 Permit Requirements

B.R. 3:10.1 General

The Contractor shall comply with the requirements of any and all permits required for the construction of this project. For any excavation in roadways, a road cut permit will be required from the roadway authority. The Contractor shall provide all insurance, bonds, etc. as required by the necessary permits. The Contractor shall also obtain and comply with any additional permits required for the completion of this project. The Contractor shall provide all insurance, bonds, etc. as required by these permits at no extra cost.

B.R. 3:10.2 Payment

Payment for compliance and procurement of any Permits required shall be included in the contract unit price bid for each Cured-in-Place Pipe Lateral Reconstruction.

B.R. 3:11 Restoration Work

B.R. 3:11.1 General

All restoration of private and public property, sidewalks, driveways, all other slab work, concrete and asphalt, drainage channels, storm sewers and dry wells, disturbed or damaged as a result of this construction project shall be promptly completed, in conformance with roadway authority standards or on private property equal to or better than the existing conditions as directed by the District and guaranteed by the Contractor for a period of two (2) years following satisfactory completion and final acceptance of the total contract.

All excavated areas shall be guaranteed against subsidence and settlement for a period of three (3) years after final completion of the contract. Any restoration work damaged as a result of trench subsidence shall be restored again at no cost to the District.

All storm sewer, watermain, gas main, corrugated metal pipe, drainage tile or other drainage devices shall be repaired and re-laid or replaced at original elevations. Pipes which have been, in the estimation of the District significantly damaged by the Contractor, shall be replaced with new pipe of the same diameter, length and type, at no added expense to the owner; any necessary couplings and fittings shall be used as necessary, and the work shall be satisfactory to the District. When necessary, temporary restoration of roads, drives, fences, etc. will be required.

B.R. 3:11.2 Surface Restoration

Restoration work shall include the following provisions:

1. All soil, brush and debris resulting from construction shall be removed and disposed of in a satisfactory manner. The surface of the ground, all fences and other structures on the premises or adjacent premises touched or in any manner altered by the construction of the sewer, shall be restored to a condition equally as good as or better than existed before the commencement of the work.

2. All restoration of property, sidewalks, driveways, all other slab work, concrete and asphalt, drainage channels and dry wells, disturbed or damaged as a result of this construction project shall be promptly completed, and equal to or better than the existing conditions, as directed by the District, and guaranteed by the Contractor for a period of two (2) years following satisfactory completion and final acceptance of the total contract.
3. Ground surfaces in that were covered with grass previous to construction shall be returned to original grade and seeded per B.R. 3:12. Excavated and stockpiled topsoil may be used for this item if acceptable to the District; otherwise approved topsoil may have to be imported.
4. Reference is made to the *General Provisions and Technical Specifications for Service Lateral Construction*, T.S. 4:2, for specifications on seeding and sodding and fertilizer, and to Sections 250, 251, and 252 of the *Standard Specifications for Road and Bridge Construction in Illinois*.
5. On private property and public right-of-way, the Contractor shall remove and replace (or replant) all bushes, shrubs and plants damaged or destroyed with species of similar type, size and quantity. These shall be guaranteed for a period of two (2) years after job completion.

B.R. 3:11.3 Payment

Payment for Restoration Work shall be included in the contract unit price bid for each Cured-in-Place Pipe Lateral Reconstruction.

B.R. 3:12 Seeding, Sodding, and Fertilizer

B.R. 3:12.1 General

Ground surfaces covered with grass prior to construction or areas formerly paved not being repaved shall be seeded as directed by the District. This work shall consist of repairing all disturbed areas with topsoil of a thickness equal to that which exists or a minimum of 4" of topsoil (compacted) and seeding. Seeding or Sodding shall be placed on four-inch (4") minimum topsoil bed. The locations from which the topsoil is to be obtained shall be approved by the District. A sample of the proposed topsoil shall be submitted to the District in a one-quart glass container, completely filled. When requested, the Contractor shall furnish a chemical and mechanical analysis of the topsoil by an approved independent testing laboratory.

Topsoil material shall be indigenous to Winnebago County and may be used providing it meets with the requirements of Article 1081.05 of the *Standard Specifications* and has no more than 55% sand content as determined in accordance with AASHTO T88. Seeding method shall consist of applying seed, fertilizer and wood mulch hydraulically on prepared seed bed in accordance with IDOT Sections 250 and 251 insofar as said sections apply.

Seeding Class I: Revise IDOT Article 250.07 to read: Regardless of season, all disturbed areas shall be seeded with following mixture:

Kentucky Blue Grass	100 lbs./acre
Perennial Ryegrass	100 lbs./acre <u>OR EQUAL</u>
Creeping Red Fescue	100 lbs./acre

Seeding will be permitted from April 1 to May 30 and from August 1 to October 10, unless approved by the District.

Fertilizer shall be furnished and applied to the following nutrients and percentages by weight in pounds:

Nitrogen	6%	
Phosphorus	24%	<u>OR BY SOIL ANALYSIS</u>
Potassium	24%	

Fertilizer shall be applied at a rate of 300 lbs./acre. Second fertilizer application three weeks after seeding of 10-10-10, 250 lbs./acre, if good stand is achieved.

Wood Fiber Mulch: This specification describes a mulch for use with the hydraulic application of grass seed which shall consist of specifically prepared wood cellulose fiber.

It shall be processed in such a manner that it will contain no growth or germination inhibiting factors and shall be dyed an appropriate color to facilitate metering of materials. It shall be manufactured in such a manner that after addition and agitation in slurry tanks with fertilizers, grass seeds, water and any other approved additives, the fibers in the material will become uniformly suspended and form a homogeneous slurry; and that when hydraulically sprayed on the ground, the material will form a blotter-like ground cover impregnated uniformly with grass seed, and which after application, will allow the absorption of moisture and percolation of rainfall or mechanical watering to the underlying soil.

Wood mulch shall be applied at the rate of 0.5 tons/acre.

Weight specifications of this material from suppliers, and for all applications, shall refer only to air dry weight of the fiber material. Absolute air dry weight is based on the normal weight standard of the technical Association of the Pulp and Paper Industry for wood cellulose and is considered equivalent to 10% moisture. Each package of the cellulose fiber shall be marked by the manufacturer to show the air dry weight content.

Suppliers shall be prepared to certify that laboratory and field testing of their product has been accomplished, and that it meets all of the foregoing requirements based upon such testing.

Guarantee: All seeded areas shall be maintained for at least 45 days after application. Scattered base spots no larger than two square feet will be allowed up to a maximum of 5% of any seeded area including 30-day maintenance and mowing.

Reference is made to T.S. 4:2 of the *General Provisions and Technical Specifications for Service Lateral Construction* for specifications on seeding and sodding and fertilizer and to Sections 250 - 254 of the *Standard Specifications for Road and Bridge Construction in Illinois*.

B.R. 3:12.2 Payment

Payment for Seeding, Sodding, and Fertilizer shall be included in the contract unit price bid for each Cured-in-Place Pipe Lateral Reconstruction.

B.R. 3:13 Tree Removal and Replacement

B.R. 3:13.1 General

All trees in private property which are damaged or removed by the Contractor shall be replaced with a tree of the same species and of the same diameter as the one removed. The diameter will be measured at breast height above the ground. All trees shall be protected by all means necessary and guaranteed for a period of two years from final acceptance of the project. In the event that the damaged or removed tree is greater than six inches (6") in diameter, the Contractor shall replace the tree with a multiple of smaller trees, having a minimum diameter of three inches (3") that equal the original tree diameter. Tree replacement shall be guaranteed for a period of two years from final acceptance of the project.

All trees which are located in the right-of-way and required to be removed or are damaged as a result of this project will not require replacement. Tree removal shall consist of the cutting, grubbing, removal and disposal of all trees and stumps as determined to be necessary to accomplish construction. This work shall be per Section 201 of the *I.D.O.T. Standard Specifications for Road and Bridge Construction*, current edition. All tree removal shall be approved by the District Inspector prior to removal.

B.R. 3:13.2 Payment

Payment for Tree Removal and Replacement shall be included in the contract unit price bid for each Cured-in-Place Pipe Lateral Reconstruction.

B.R. 3:14 Cleanup

B.R. 3:14.1 General

At completion of work, the Contractor shall clean up and remove from the entire length of project all debris, materials, form work, machines, etc., resulting as a consequence of work under this contract. Any debris removed from Service Laterals must be hauled away to a site acceptable to the District. Debris removed from sewers during cleaning may be deposited at the District's dump pad, located at 3333 Kishwaukee St, Rockford, IL at no cost to the Contractor.

B.R. 3:14.2 Payment

Payment for Cleanup shall be included in the contract unit price bid for each Cured-in-Place Pipe Lateral Reconstruction.

B.R. 3:15 Utility Relocation

B.R. 3:15.1 General

The Contractor shall be responsible for relocation and reconstruction of all utilities, power poles, signs, lights, signals, underground utilities, etc. conflicting with the proposed construction whether temporary or permanent in accordance with G.R. 9.1, Page 30 of the *General Provisions and Technical Specifications for Service Lateral Construction*. Contractor shall be responsible for support and protection of any and all of these items where construction passes close by.

Throughout the course of this project the Contractor shall be responsible for maintaining the current level of utility and other services to any properties affected by construction.

B.R. 3:15.2 Payment

Payment for Utility Relocation shall be included in the contract unit price bid for each Cured-in-Place Pipe Lateral Reconstruction.

B.R. 3:16 Safety and Traffic Control

B.R. 3:16.1 General

The work described under this contract includes work within sanitary sewers, an environment deemed hazardous by State and Federal authorities. The Contractor shall employ safety measures appropriate for such work. The Contractor shall be solely responsible for the safety of the operations. He shall comply with all state, local and OSHA regulations. The Contractor shall meet all the requirements of all permits secured for this project.

During the course of construction, the Contractor shall keep a minimum of one lane of traffic open in any affected streets.

Safety Program: The Contractor shall develop and maintain for the duration of this contract, a safety program that will effectively incorporate and implement all required safety provisions as determined by O.S.H.A. 29 CFR.

Roadway Safety: The Contractor shall comply with all rules and regulations of the State, County, and City authorities regarding closing or restricting the use of public streets or highways. No public or private road shall be closed, except by express permission of the District. Conduct the work so as to assure the least possible obstruction to traffic and normal commercial pursuits. Protect all obstructions within traveled roadways by installing approved signs, barricades, and lights where necessary for the safety of the public. The Contractor shall notify the appropriate roadway authority a minimum of 72 hours prior to beginning any work for approval of traffic control in any affected streets, as well as required detour routes and signing.

Flagman: When flagmen and guards are required by regulation or when deemed necessary for safety, the Contractor shall furnish the flagmen or guards with approved orange wearing apparel and other regulation traffic control devices.

B.R. 3:16.2 Payment

Payment for Safety and Traffic Control shall be included in the contract unit price bid for each Cured-in-Place Pipe Lateral Reconstruction.

B.R. 3:17 Warranty

The Contractor shall unconditionally warrant their products for a period of two (2) years (730 days) commencing on the date installation of the entire project is completed and accepted, in writing, by the District. The Contractor shall repair, at his own expense, any defects in the liner that will affect the integrity or strength of the pipe. All repairs will be performed in a manner that is mutually agreed upon by the District and the Contractor. Any such repairs shall likewise be covered by the same warranty period from the date of subsequent installation and written approval by the District.

Any repairs required after the service liner is installed and within the two year warranty period will require testing in accordance with T.S. 9 Acceptance Tests, Pages 94 through 98 of the *General Provisions and Technical Specifications for Service Lateral Construction*. This testing shall be performed by the Contractor at no additional cost to the District. Complete site restoration of any repairs shall also be the responsibility of the Contractor. All trenches and related restoration shall be guaranteed against settlement for a period of three (3) years from the date the project is completed.

During the warranty period, any defects, which will affect the integrity or strength of the cured-in-place pipe, will be repaired at the Installer's expense in a manner mutually agreed upon by the Owner and the Installer.

B.R. 3:18 General Notes

B.R. 3:18.1 Utility Notification

The Contractor is to notify all utility companies, as well as JULIE (1-800-892-0123), at least 48 hours prior to any excavation. The Contractor shall notify all affected public agencies and the Rock River Water Reclamation District 72 hours before beginning work.

B.R. 3:18.2 Specifications

The specifications entitled *General Provisions and Technical Specifications for Sanitary Sewer Construction* shall be the official prevailing specifications for this sewer construction for the Rock River Water Reclamation District. (Latest revision: October 13, 1983.)

B.R. 3:18.3 Damage to Structures

The Contractor is responsible for any damages caused by his operations to existing structures above or below the ground as covered in G.C. 12:1 Suits At Law, Pages 16 and 17 of the *General Provisions and Technical Specifications for Sanitary Sewer Construction*.

B.R. 3:18.4 IDOT Specifications

The Standard Specifications for Road and Bridge Construction, Illinois Department of Transportation, referred to in this specification shall be current edition.

B.R. 3:18.5 Access

The Contractor shall provide access to the residences and/or businesses, schools, etc. at all times (i.e., drives, roadways, ramps must remain open or must be provided) over the course of this Contract. All materials, equipment, labor, etc. necessary to assure this shall be considered a part of the contract unit price for Cured-In-Place Pipe Lateral Reconstruction Sewer Lining.

B.R. 3:18.6 Materials and Equipment Warranty

Suppliers shall be deemed to impliedly warrant that their products and all component materials incorporated into them are suitable and fit for the intended use of such products and shall be free from defects in material, workmanship or design, for a period of five (5) years from the date of final acceptance. Such warranty to run to the benefit of the District. The foregoing applies whether the products or their component materials are specified in the Contract Documents or are of supplier's design.

B.R. 3:18.7 Means, Methods, Techniques and Safety

The District will not supervise, direct, control or have authority over or be responsible for the Contractor's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of the Contractor to comply with Laws and Regulations applicable to the furnishing or performance of the Work. The District will not be responsible for the Contractor's failure to perform or furnish the Work in accordance with the Contract Documents.

B.R. 3:19 Modification of Sewer Service Connection at Main

B.R. 3:19.1 General

1. Prior to installing the service liner the Contractor shall locate the sewer lateral openings in the lined sewer main by televising. The Contractor shall inspect service openings in the existing liner pipe.
2. If required the Contractor shall modify / re-cut or brush existing service connections to achieve 100% of the original opening. Service modification shall be done without excavation from the interior of the pipe by means of a television camera and a remotely controlled cutting device or brush. The edges of the service cut-ins shall be smooth and even. There shall be no rough or jagged edges. The entire circumference (360°) of the sewer service reinstatement shall be televised and recorded on the post-lining videotape.

The service opening shall be reviewed by the District prior to modification and shall meet District approval prior to lining.

3. Any pieces of the liner that were cut from the service connections shall be captured at the downstream manhole and disposed of by the Contractor.

B.R. 3:19.2 Payment

Payment for Modification of the Sewer Service Connection at the sewer main shall be made based on the contract unit price for each Sanitary Sewer Service Reinstatement Modified.