MICHIGAN

DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION

FOR

**CLEANING AND TELEVISING SANITARY SEWER PIPELINE ASSESSMENT CERTIFICATION PROGRAM**

GND:TCS 1 of 7 APPR:DMG:RPB:09-22-23

**a. Description.** The work includes cleaning, dewatering or diverting of flow in sanitary sewers to the degree necessary, and inspection by closed circuit television as shown on the plans or as directed by the Engineer. Perform this work in accordance with subsection 402.03.I and 402.03.J of the Standard Specifications for Construction, and this special provision.

1. Submittals.

A. Televising software to be utilized and National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP)© template version number.

B. Operator’s PACP certification number.

**b. Materials.** None specified.

**c. Construction.**

1. Sewer Flow Control. Dewater or divert the flow in sewers to the degree necessary for cleaning and inspecting of sewers, or manhole and sewer rehabilitation procedures.

A. Furnish to the Engineer, 5 days prior to starting work, for review, the proposed method of dewatering sewers.

B. Depth of Flow. When sewer line depth of flow, as measured at the upstream manhole of the sewer section where work is to be performed, is above the maximum allowable level specified herein, reduce the flow level by plugging or blocking of the flow, or pumping and bypassing of the flow as specified.

Do not exceed depth of flow shown below for the respective pipe sizes as measured in the upstream manhole when performing television inspection, joint testing and/or sealing.

(1) Maximum Depth of Flow - Television Inspection

6 inch to 10 inch pipe 20 percent of the pipe diameter

12 inch to 24 inch pipe 25 percent of the pipe diameter

27 inch and up pipe 30 percent of the pipe diameter

(2) Maximum Depth of Flow - Joint Testing/Sealing

6 inch to 10 inch pipe 25 percent of the pipe diameter

12 inch to 24 inch pipe 30 percent of the pipe diameter

27 inch and up pipe 35 percent of the pipe diameter

C. Plugging or Blocking. Insert a sewer line plug into the line upstream of the section being worked on. Design the plug so that all or any portion of the sewage can be released. During television inspection, testing and sealing operations, reduce the flow level to within the limits specified above. After the work has been completed, restore the flow to normal.

D. Pumping and Bypassing. When pumping and bypassing is required, supply the pumps, conduits, and other equipment to divert the flow of sewage around the sewer section in which work is to be performed. Ensure the bypass system is of sufficient capacity to handle existing flow plus additional flow that may occur during a rainstorm. Delay start-up of bypass pumping operations when rainfall is imminent and until the threat of rainfall has passed. Furnish the necessary labor and supervision to set up and operate the pumping and bypassing system. If pumping is required on a 24-hour basis, equip the pumps in a manner to reduce the noise emissions to a level agreed to by the Engineer.

E. Flow Control Precautions. When flow in a sewer line is plugged, blocked or bypassed, take sufficient precautions to protect the sewer lines from damage that might result from sewer surcharging. Further, take precautions to ensure that sewer flow control operations do not cause flooding or damage to public or private property being served by the sewers involved. At no time will sewage be pumped in or allowed to flow into a catch basin, storm sewer, or open watercourse. Repair or replace leaking hoses and couplings immediately.

2. Sewer Cleaning.

A. Clean sewers for inspection, including providing necessary equipment and personnel for dislodging material from the sewer pipe, removal of the debris from the system and the transport and disposal of debris removed. A disposal site will not be provided as a condition of the contract.

B. Cleaning is to remove foreign materials from the lines and restore the sewer to a minimum of 95 percent of the original carrying capacity or as required for proper seating of internal pipe joint sealing packers. It is recognized that there are some conditions such as broken pipe and major blockages that prevent cleaning from being accomplished or where additional damage would result if cleaning were attempted or continued. Should such conditions be encountered, the Contractor will not be required to clean those specific sewer sections. If in the course of normal cleaning operations, damage does result from preexisting and unforeseen conditions such as broken pipe, the Contractor will not be held responsible.

3. Sewer Cleaning Methods. Clean the designated sewer sections using hydraulically propelled, high-velocity jet, or mechanically powered equipment. Base the selection of the equipment used on the conditions of lines at the time the work commences. Ensure the equipment and methods selected are satisfactory to the Engineer. Ensure the equipment is capable of removing dirt, grease, rocks, sand, and other materials and obstructions from the sewer lines and manholes. If cleaning of an entire section cannot be successfully performed from one manhole, set up the equipment on the other manhole in the pipe run and attempt cleaning from the opposite direction.

4. Normal Cleaning. Clean the designated sewer sections utilizing step cleaning. The first pass must extend from the downstream manhole to a point in the sewer equal to 1/3 of the total distance between the manholes which are being cleaned. The second pass must extend 2/3 of the sewer section and the third pass must extend the full distance between manholes. Ensure all passes are made using sufficient capacity of the sewer cleaning equipment. Once the section has been completed, make up to three complete passes from manhole to manhole.

A. Immediately after cleaning has been completed, visually investigate the sewer by use of closed circuit television (CCTV) and utilizing the jet to draw down enough of the existing flow to enable investigation of the bottom of the sewer. If there is still debris in the sewer, additional cleaning efforts will be paid for as “Heavy Cleaning”.

B. The CCTV necessary to verify the cleanliness of the sewers will not be paid for separately but is included in the Clean and Televise pay item. Payment will not be made for sewers which are not clean as verified by the CCTV investigation.

5. Heavy Cleaning.

A. The work of heavy cleaning is in addition to normal cleaning as outlined above and will be paid for in addition to the unit price for cleaning sewers from manhole to manhole.

B. The CCTV necessary to verify the cleanliness of the sewers will not be paid for separately but is included in the Heaving Cleaning pay item. Payment will not be made for sewers which are not clean as verified by the CCTV investigation.

C. Root Removal. Remove roots in the sections where root intrusion is discovered. Ensure special attention is used during the cleaning operation to assure removal of roots from the joints. Remove any roots which could prevent the seating of the packer or could prevent the proper application of chemical sealants. Procedures may include the use of mechanical equipment such as rodding machines, bucket machines and winches using root cutters and porcupines, and equipment such as high-velocity jet cleaners.

D. Removal and Disposal of Debris. Remove sludge, dirt, sand, rocks, grease, roots and other solid or semisolid material resulting from the cleaning operation at the downstream manhole of the section being cleaned. Passing material from sewer section to sewer section is prohibited. Remove all material from the site no less often than at the end of each workday. Accumulation of debris, etc., on the work site beyond the stated time, except in totally enclosed sealed containers and as approved by the Engineer, is prohibited.

6. Cleaning Equipment.

A. Hydraulically Propelled Equipment. Use equipment of a movable dam type constructed in such a way that a portion of the dam may be collapsed at any time during the cleaning operation to protect against flooding of the sewer. The movable dam must be equal in diameter to the pipe being cleaned and provide a flexible scraper around the outer periphery to ensure removal of grease. If sewer cleaning balls or other equipment which cannot be collapsed are used, take special precautions to prevent flooding of the sewers and public or private property.

B. High-Velocity Jet (Hydrocleaning) Equipment. Construct all high-velocity sewer cleaning equipment for ease and safety of operation. The equipment must have a selection of two or more high-velocity nozzles. Ensure the nozzles are capable of producing a scouring action from 15 to 45 degrees in all size lines designated to be cleaned. Also include a high-velocity gun for washing and scouring manhole walls and floor, capable of producing flows from a fine spray to a solid stream. The equipment must carry its own water tank, auxiliary engines, pumps, and hydraulically driven hose reel.

C. Mechanically Powered Equipment. Ensure bucket machines are used in pairs with sufficient power to perform the work in an efficient manner. Where bucket machines and buckets are to be used, take caution that a proper sized flexible cable is used so that cable breakage will not occur. Ensure machines are belt operated or have an overload device. Machines with direct drive that could cause damage to the pipe are prohibited. A power rodding machine must be either a sectional or continuous rod type capable of holding a minimum of 1,000 feet of rod. Ensure the rod is specifically heat treated steel. To ensure safe operation, the machine must be fully enclosed and have an automatic safety clutch or relief valve.

D. Large Diameter Cleaning. For cleaning large diameter sewer (sewer ranging from 27 inch to 108 inch in diameter), storm or combination pipes, a combination hydraulic high volume water and solids separation system. The flow from the sewer will provide water for the pump operation so no potable water is necessary and treatment costs are not a factor. Water volume of up to 250 gallons per minute at 2000 psi+ will move solids to the downstream manhole in high flow conditions. The separation system will dewater solids to 95 percent (passing a paint filter test) and transfer them to a dump truck for transport to a sewage treatment plant or approved landfill. Filter sewer water to a point where it can be used in the pump for continuous cleaning. No by-passing of sewer flows will be necessary. Ensure the unit is capable of 24 hour operation and must not leave the manhole until a section is fully cleaned. Ensure equipment is able to clean the length with vehicular access to one manhole only.

7. Cleaning Precautions.

A. Take precautions in the use of cleaning equipment. When hydraulically propelled cleaning tools (which depend upon water pressure to provide their cleaning force) or tools which retard the flow in the sewer line, are used, take precautions to ensure that the water pressure created does not damage or cause flooding of public or private property being served by the sewer. Ensure all damages to the private property, which result from backflushing sewer laterals, are repaired at no cost to the contract.

B. Furnish the water necessary to complete work activities. Operation of fire hydrants to obtain water is prohibited, unless approved/permitted to do so by the utility authority. Do not obstruct fire hydrants.

C. Contact and coordinate water requirements with the City of Allegan.

8. Acceptance of Sewer Cleaning. Acceptance of sewer line cleaning will be made upon the successful completion of the television inspection and is to the satisfaction of the Engineer. Reclean and reinspect sewers that are unsatisfactory until approved by the Engineer.

9. Television Inspection. Perform all CCTV inspections by CCTV personnel who are trained and certified in the use of NASSCO’s PACP.

A. Use a CCTV camera for the inspection that is specifically designed and constructed for such inspection. Use the pan/tilt/rotate features to inspect all service lateral connections to determine whether the lateral is active or plugged and to inspect the structural integrity of the lateral and connection to the sewer main. Use the pan/tilt/rotate feature where practical to provide additional information such as wide joints, holes in pipe, cracks, etc. Ensure lighting for the camera is suitable to allow a clear picture of the entire periphery of the pipe. Ensure the camera can operate in 100 percent humidity conditions. Ensure the camera, television monitor, and other components of the video system are capable of producing picture quality to the satisfaction of the Engineer; and if unsatisfactory, remove the equipment and no payment will be made for an unsatisfactory inspection.

B. Move the CCTV camera through the line in either direction at a moderate rate, stopping when necessary to permit proper documentation of the sewer’s condition. In no case will the television camera be pulled at a speed greater than 30 feet per minute. Manual winches, power winches, TV cable, and powered rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions may be used to move the camera through the sewer line. If, during the inspection operation, the television camera will not pass through the entire manhole section, the Contractor must set up his equipment so that the inspection can be performed from the opposite manhole. If, again, the camera fails to pass through the entire manhole section, the inspection will be considered complete and no additional inspection will be required.

C. Position the camera lens looking along the axis of the sewer and within 10 percent of the vertical centerline of the pipe. For sewers that are taller than wide (egg or elliptical shaped, etc.), position the camera lens looking along the axis of the sewer and vertically above the invert at a height of 2/3 of the vertical dimension of the sewer.

D. When manually operated winches are used to pull the CCTV camera through the line, use telephones or other suitable means of communication between the two manholes of the section being inspected to ensure good communications between members of the crew. In the event the camera becomes trapped in the sewer, notify the Engineer immediately. The Contractor must monitor adjacent and private properties to avoid flooding until the camera is freed.

E. The importance of accurate distance measurements is emphasized. Ensure measurement for location of defects is above ground by means of a meter device. Marking on the cable, or the like, which would require interpolation for depth of manhole, will not be allowed. Check the accuracy of the distance meter by use of a walking meter, roll-a-tape, or other suitable device. Ensure the accuracy is satisfactory to the Engineer. Make all measurements from the wall of the structure in accordance with NASSCO’s PACP guidelines.

10. Reporting. Furnish the Engineer with two copies each of the televising video in a digital format (CD, DVD, or Portable USB hard drive) and an electronic report of the televising activities. Furnish the Engineer with the televising data (televising videos and electronic reports) on a weekly basis until the completion of the project. Perform reporting in a PACP certified software with the most current version of the PACP template.

A. Television Inspection Report. Keep printed location records and clearly show the location in relation to an adjacent manhole for each defect observed during inspection. Observations of structural defects, operational and maintenance defects, construction observations, or miscellaneous features must be recorded in accordance with NASSCO’s PACP guidelines. The report must also show the date of the inspection, manhole numbers, location, direction of flow, pipe diameter/size, pipe material, name of operator, report number, and the length of sewer inspected.

(1) Exporting Data. Furnish the Engineer with the exported PACP database. Export the database in the most current PACP export conversion unless otherwise directed by the Engineer.

B. Video Recordings. The purpose of video recordings is to supply a visual and audio record of problem areas of the lines that may be replayed. Ensure video recording playback is at the same speed that it was recorded. Slow motion or stop-motion playback features may be supplied at the option of the Contractor. Video and playback equipment need to be readily accessible for review by the Engineer during the project. Ensure video recordings are performed in NASSCO certified PACP software. Ensure videos are in color and formatted MPEG1. The date of inspection, manhole numbers, location, direction of flow, pipe diameter/size, pipe material, name of operator, and the report number must appear transparent in the middle of the viewing screen at the start of the video. The manhole numbers and location must appear transparent throughout the televising and displayed in the bottom left or right quadrant without obstruction to viewing the condition of the pipe.

(1) Naming Convention. Name each video as follows: Upstream Manhole\_ Downstream Manhole\_Direction of travel (upstream or downstream).

11. Existing Utilities. Protect existing utilities encountered during the work. Repair damaged utilities at no additional cost to the contract.

12. Access. Do not trespass or disturb private property without first obtaining written permission from the property owner. Maneuver equipment around poles, trees, fences, or other obstructions, as necessary to complete the work.

13. Traffic Control. Furnish in accordance with the Special Provision for Maintaining Traffic.

14. Restoration. Restore all disturbed areas in accordance with the contract.

**d. Measurement and Payment.** The completed work, as described, will be measured and paid for at the contract unit price using the following pay items:

**Pay Item Pay Unit**

Clean and Televise \_\_ inch Sanitary Sewer Foot

Heavy Cleaning \_\_ inch Sanitary Sewer Foot

1. The completed work for **Clean and Televise \_\_ inch Sanitary Sewer** of the size specified will be measured on a foot basis from the wall of the entering structure to the wall of the exiting structure. **Clean and Televise \_\_ inch Sanitary Sewer** includes cleaning, disposal of debris removed from the sewer, flow control as necessary, television inspection, and reports as specified in accordance with NASSCO’s PACP guidelines.

2. The completed work for **Heavy Cleaning \_\_ inch Sanitary Sewer** will be measured on a foot basis from the wall of the entering structure to the wall of the exiting structure. **Heavy Cleaning \_\_ inch Sanitary Sewer** includes cleaning in addition to normal cleaning, disposal of debris removed from the sewer, and flow control as necessary.