City of Waukesha Construction Specifiactions

SANITARY SEWER

No. 40 - The Contractor shall not remove any pavement beyond what is necessary for installing the sanitary sewer, water main and storm sewer than what can be expected to be relayed that day. Once the utility work is complete, pavement can be removed for the road reconstruction.

No. 44 - The City of Waukesha will furnish replacement manhole and storm inlet frames and covers. All sanitary and storm sewer structures shall receive a new frame and cover. The Contractor should be aware that the City is purchasing covers that identify the structure as either "Storm Sewer" or "Sanitary Sewer" and should make sure that the appropriate cover is used. These are stored at the Waukesha Municipal Garage, 300 Sentry Drive.

No. 66 - The Contractor shall use PVC pipe with gasket joints conforming to ASTM D3034 and with a dimensional ratio of SDR 35. The cost for sanitary sewer shall be paid for under the respective Unit Bid Items for Lin. Ft. of Sanitary Sewer.

No. 67 - The contractor will not be permitted to change pipe material or classification between structures.

No. 68 - All pipe must be inspected and marked prior to delivery to the job by an accredited testing laboratory. This cost shall be considered incidental to the contract.

No. 69 - The Contractor shall be responsible for providing all pumps, conduits, and other equipment required to divert the flow of sewage around the work area. The Contractor shall insure that surcharging and backups do not occur on public and private property. The Contractor will be required to make a temporary connection between the existing and proposed sewers and remove any diversion methods at the end of the day.

No. 70 - All manholes are to be 48-Inch diameter precast manholes with preformed troughs and benches. Troughs for all incoming pipes shall be four inches deep or to the springline of the pipe, whichever is greater. Laterals shall not to be connected to a manhole, unless approved by the Engineer. All manholes shall be built to the proposed grades.

No. 71 - Manholes with outside drops shall be constructed in accordance with File No. 19 in the Standard Specifications for Sewer and Water Construction in Wisconsin, Sixth Edition, except Class "D" concrete will not be permitted. **The outside drops are not to be precast with the structure.**

No. 72 - The connections to the existing manholes or sewers shall be in a method approved by the Engineer. The length of pipe between the existing sewer and new structure that is removed and replaced shall be incidental to the work and shall not be included in the total payment quantity.

No. 73 - Connections to existing pipes shall be with gasketed PVC connectors for PVC to PVC connections, or Fernco Shielded Coupling, or equivalent, for dissimilar pipe material.

No. 74 - If the Contractor damages any sewer or manhole during construction, the cost of the necessary repairs including any pavement repairs, shall be at the Contractor's expense. The method of repair shall be approved by the Engineer.

No. 75 - Any sewers or manholes which are abandoned and left in place shall be done in accordance with 3.2.24 in the Standard Specifications for Sewer and Water Construction in Wisconsin, 6th Edition, except manholes shall be removed to a depth of 3-feet below the surface or to the bottom of the cone, whichever is deeper. Sewers 15-Inches and larger shall be filled with controlled low-strength material (CLSM / flowable fill).

The flowable fill shall meet the following requirements:

- Strength – 200 psi
- Type I cement – 30 lbs
- Fly ash – 250 lbs
- Sand – 2728 lbs
- Total air – 9.0% +/- 1%
- Air entrainment – 35 oz
- Water – 50 gal
- Water/cement ratio – 1.49
- Slump – 10 in +/- 1 in

4 No. 77 - Prior to the project, the City shall televise and locate the sanitary sewer laterals from the mainline to the property, as far as possible to verify the connection status, the condition, and the location of each lateral. Upon request, the City can relocate the majority of the laterals using the survey data.

No. 83 - The entire chimney on all sanitary and storm manholes shall consist of adjustment rings manufactured from ARPRO Expanded Polypropylene (EPP). The rings shall be manufactured using a high compression molding process to produce a finished density of 120 g/l (7.5 pcf). Material shall be Pro-Ring as supplied by Cretex Specialty Products.

No. 118 - The Contractor shall hire an independent television inspection service to perform a closed-circuit television inspection of all main line sewers and laterals (sanitary and storm) within the project limits after all underground work has been completed but before the final asphalt surface has been placed. The underground work shall be defined as comprising any activity that could potentially damage a sewer facility, which includes but is not limited to utility installation (including third party utility work), traffic signal and street light bases and conduits, and tree planting.

A. EQUIPMENT

a. The televising camera used for the inspection shall be one specifically designed and constructed for sanitary sewer inspection. The camera shall be a pan-and-tilt type capable of radial inspection of the top, bottom, and sides of the pipe including lateral connections. Lighting for the camera shall be suitable to allow a clear picture of the entire periphery of the pipe. The camera shall be operative in 100% humidity conditions. The camera, television monitor, and other components of the video system shall be capable of producing picture quality to the satisfaction of the City. If the equipment proves to be unsatisfactory, it shall be replaced with adequate equipment.

b. Lateral cameras shall be color, shall be self-leveling, and equipped with a footage counter to provide on screen display of footage measurement.

c. **The Contractor shall collect all inspection data using PipeTech Software by Peninsular Technologies. Inspections conducted with other software packages or converted to other formats will not be accepted.**

B. PROCEDURE

a. The main line sewer sections, defined as the length of pipe from center of manhole or structure to center of manhole or structure, shall be televised one section at a time.

b. For the televising of laterals, the main line sewer television camera shall be used to position the lateral camera launcher. At a minimum, the lateral sewer camera shall inspect laterals to the right-of-way limits, or in the case of a lateral replacement, to the upstream limit of the replacement plus an additional five (5) feet upstream. Video recording shall continue during the entire camera withdrawal sequence. The television inspection of the lateral must be from inside the main line sewer up into the lateral and shall include a spot location with depth at the curbline and back of sidewalk. Inspections from cleanouts, excavations, or other access points will not be accepted.

c. The Contractor shall fully televise both ends of the main line pipe so the connections at the manholes can be evaluated.

d. Wherever possible the inspections shall be performed in the upstream to downstream direction.

e. When sewer conditions prevent forward movement of the camera, the camera shall be withdrawn, and Contractor shall televise the line from the opposite direction.

f. The camera shall be directed through the sewer at a uniform, slow rate. In no case will the video camera record while moving at a speed greater than 30 feet per

minute. If the inspection is rejected due to camera speeds exceeding 30 feet per minute, the inspection recordings shall be redone at no additional cost to the City.

g. Flow levels within existing sewers to be inspected shall not exceed 5% of the pipe diameter. If water levels prevent adequate televising of the sewer, then conducting the work during low flow periods or other methods like plugging and bypass pumping shall be implemented.

h. For inspection of new sewers (not yet in service), the Contractor shall introduce clean water into the upstream manhole and keep water flowing until flow is observed at the downstream manhole location.

i. The survey unit shall be slowed, stopped, or backed-up to perform detailed inspections of significant features. The camera shall be stopped at all defects, changes in material, water level, size, side connections, manholes, junctions, or other unusual areas. When stopped at the defect or feature, the operator shall pan the camera to the area and along the circumference of the pipe.

j. The operator shall also record audio of the type of defect or feature, clock position, footage, extent or other pertinent data.

k. Audio shall be recorded during each inspection by the operating technician, electronic voice text recognition or approved equal on the inspection video as the sewer is inspected and shall include the sewer location, identification of beginning and terminating manholes including location (address or cross streets), inspection direction, length of inspection, side sewer identification, flow information, complete descriptions of the sewer line conditions as they are encountered, description of the rehabilitation work, reason for termination, and other relevant commentary to the inspections. Voice descriptions should be made: 1) at points of pipe failure or weakness, 2) at points of infiltration, 3) at the location of service connections, 4) at points where unusual conditions are noted, and 5) at points where digital still photos are taken.

   In addition, the audio reports shall include the distance traveled on the specific run, a description of abnormal conditions in the sewer and side sewer connections as they are encountered, explanations for pausing, backing up, or stopping the survey, and the final measured center to center distances between consecutive manholes. The audio portion of the composite video shall be sufficiently free from electrical interference and background noise to provide complete intelligibility of the oral report. Audio dubbing after the inspection is prohibited.

l. If the video and/or audio recording is of poor quality, the City has the right to require a re-submittal of the affected sewer sections and the inspection will not be deemed complete until an acceptable video and audio recording is made, submitted to, and accepted by the City.

m. Measurement for location of defects and actual length of pipe shall be by means of a calibrated meter on the camera with a digital readout on the video monitor. This readout shall be included in the video recording. Marking on cable, or the like, which would require interpolation for depth of manhole, will not be allowed. Measurement will be accurate to one foot per 100 feet of inspected pipe. Accuracy of the distance meter shall be checked by use of a walking meter, roll-a-tape, or other suitable device, and the accuracy shall be satisfactory to the City.

n. All inspections shall be performed by NASSCO PACP certified personnel. Use of PACP certified technicians to review/document defects in the office (post process) is not acceptable.

o. Any structural defects found along the main line sewer and laterals shall be immediately brought to the Engineer's attention for a determination of the necessary repair.

C. DOCUMENTATION

a. The inspection data shall be compatible with the City's GIS and Asset Management Systems and shall be collected with PipeTech.

b. Television Inspection Logs: Electronic media location records shall be kept by the Contractor and shall clearly show the location, by distance in 1/10 of a foot, from the center of the starting manhole or structure to each observation during inspection. Observations shall include, but not limited to, infiltration, service connections, unusual conditions, roots, storm sewer connections, cracks, fractures, broken pipe, presence of scale and corrosion, and other discernible features, as defined in the PACP defect codes, shall be recorded on electronic media and a copy of such records shall be supplied to the City.

c. Digital photographs of the pipe condition and all defects shall be taken by the Contractor. Photographs shall be located by distance in 1/10 of a foot, from the center of the starting manhole or structure.

d. Electronic media recordings collected with including the digital video, images, and data files shall be created for each sewer section and lateral inspected. Files shall be submitted on DVD, flash drive, or portable hard drive. The purpose of electronic media recording shall be to supply a visual and audio record of the condition of the sewer lines that may be replayed by the City. Once recorded, the video shall become the property of the City.

The City shall provide maps showing the structure and section numbers to be used.

The Contractor shall be notified in writing of any deficiencies revealed by the television inspection that will require repair, following which the Contractor shall excavate and make the necessary repairs and schedule a television re-inspection of the repaired or corrected areas. Television re-inspection shall be at the Contractor's expense.
The contractor may submit the post CIPP lining inspection as the Pre-Paving televising provided all other underground work is complete prior to the inspection. If the post CIPP inspection is used, the cost of inspecting those sections is incidental to the lining process.

STORM SEWER

No. 85 - The Contractor shall use reinforced concrete sewer pipe (R.C.S.P.) for the proposed storm sewer, except as indicated on the plans. All pipes shall have an approved gasket joint. The cost for the storms sewer shall be paid for under the Unit Bid Items for Storm Sewer. The Contractor will be required to use the following pipe classes:

- Class V for 12-Inch diameter pipe
- Class IV for 15-Inch diameter pipe
- Class III for 18-Inch diameter pipe

No. 89 - The Contractor is required to remove or abandon existing storm sewers and structures as indicated on the plans. Any pipe sections or manholes which are abandoned and left in place shall be done in accordance with 3.2.24 in the Standard Specifications for Sewer and Water Construction in Wisconsin, 6th Edition, except that the abandoning of all pipe, or structure shall be completed by completely filling with sand slurry. Manholes shall be removed to a depth 3 feet below the surface or the bottom of the cone, which ever is deeper.

No. 90 - All manholes and inlets are to be built to proposed grade and alignment. The cost for adjusting and backplastering new structures shall be included in the bid items for new storm manholes and inlets.

A 2-Foot sump is required in all proposed storm catch basin inlet structures. Pay measurement will include these sumps and be measured from bottom of sump to rim of storm sewer manhole or inlet.

The Contractor is to be aware that all existing structures are to be replaced with new structures as shown on the plans.

No. 93 - The Contractor is responsible for protecting the proposed storm sewer during all stages of construction. Prior to paving, the Contractor shall inspect the storm sewer for damage.

No. 95 - The City of Waukesha will furnish all storm sewer manhole frames and covers and storm inlet frames and grates. These shall be stored at the Waukesha Municipal Garage, 300 Sentry Drive, Waukesha, and must be hauled from this yard to the construction site by the Contractor and placed in their proper positions at his expense. Any breakage, which occurs after delivery to the Contractor, shall be replaced and paid for by the Contractor. The Contractor shall be responsible for insuring the correct covers are placed on the storm manholes.

The frames and covers from any structures which are removed or rebuilt shall be salvaged and returned to the City Garage by the Contractor.

The replacement and any adjustment of chimneys on existing manholes within the paving limits shall consist of removing the entire chimney down to the cone section or lower as needed, and replacing with the Pro-Rings to the proposed elevations and removing and replacing the frame and cover. This work will be paid for according to the unit bid item for "Chimney Replacement". The cost of the chimney and any adjustments on new manholes shall be included in the unit bid price for "Standard Storm Manhole".

No. 96 - The contractor shall install a Cured-In-Place pipe (CIPP) Liner the sanitary and storm sewers as indicated on the plans. The contractor shall coordinate this work to avoid any disruptions in the schedule or the integrity of the finished liner between structures.