

SECTION 33 08 30

COMMISSIONING OF SANITARY SEWER UTILITIES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Testing of sanitary sewer pipe, manholes, fittings, and miscellaneous appurtenances.

B. Related Sections:

1. Section 33 31 00 – Sanitary Utility Sewer Piping
2. Section 33 31 14 – Sanitary Sewer Services
3. Section 33 39 00 – Sanitary Utility Sewer Structures

1.02 REFERENCES

A. American Society of Testing Materials (ASTM):

1. C924 – Standard Practice for Testing Concrete Pipe Sewer Line by Low-Pressure Air Test Method.
2. C969 – Standard Practice for Infiltration and Exfiltration Testing of Installed Precast Concrete Pipe Sewer Lines.
3. C1103 – Standard Practice for Joint Acceptance Testing of Installed Precast Concrete Pipe Sewer Line.
4. C1244 – Standard Test Method for Concrete Sewer Manholes by Negative Air Pressure.
5. F1417 – Standard Test Method for Installation Acceptance of Plastic Gravity Sewer Lines using Low-Pressure Air.

1.03 SUBMITTALS

A. Submit the following items consistent with Section 01 33 00

1. 1 copy on hdmi jump drive of sewer televising and 1 copy of the written report on conditions.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Commence test procedures only after trench has been backfilled, pipe and structures are clean and free of dirt, water, or other foreign material.

3.02 FIELD QUALITY CONTROL

- A. All tests must be witnessed by the City and/or the Engineer.
- B. Contractor shall provide all material, equipment, and labor required to test the sanitary sewer systems.

C. Forcemain Tests and Inspection

- 1. Hydrostatic Pressure Test
 - a. Minimum Test Pressure: 150 psi.
 - b. Test Duration: 2 hours.
 - c. Criteria: No drop in pressure allowed.
 - d. Testing gauge shall be liquid filled, 4-1/2 inch diameter, labeled in 1-psi increments, such as Ashcroft Model 1082, or equal.
 - e. All newly installed lines shall be tested.

D. Continuity Test

- 1. Test to be completed on the tracer wire after installation of all Project utilities.
- 2. Fill all forcemain lines prior to the test.
- 3. Test all lines, including sanitary services and stubs.
- 4. Test: Physically locate all pipes with use of an electronic utility locating device.

E. Gravity Pipe Leak Testing

- 1. General
 - a. Test all systems (pipe and structures) for leakage before being put in service. Notify Engineer minimum of 1 day prior to actual testing. Test in section length increments deemed necessary by the Engineer.
 - b. Individual tests must be completed between each manhole section and accepted by the Engineer.
- 2. Low Pressure Air Test
 - a. Diameter: Less than or equal to 24 inches.
 - b. Must meet criteria set forth in ASTM F1417.
 - c. Groundwater level shall be no higher than 2 feet above the top of pipe at upstream end.
 - d. Acceptable time for loss of 0.5 psig of air pressure shall be the larger of the 2 times below:

| Pipe Size | Min. Time (Min's) | Time (s/ft of pipe) |
|-----------|-------------------|---------------------|
| 8 | 3:50 | 0.760 |
| 10 | 4:40 | 1.187 |
| 12 | 5:40 | 1.709 |

| | | |
|----|-------|-------|
| 15 | 7:05 | 2.671 |
| 18 | 8:30 | 3.846 |
| 21 | 9:55 | 5.235 |
| 24 | 11:20 | 6.837 |

F. Gravity Pipe Deflection Testing

1. Required for all flexible pipe (PVC and HDPE)
2. Deflection Testing Methods
 - a. Pipe Diameter Through 24 Inches: Pull mandrel through the pipe by hand (without aid of mechanical pulling devices).
3. Deflection testing shall be conducted at least 30 days after the pipe has been backfilled to the desired finish grade.
4. Mandrel Diameter Requirements
 - a. Diameter equal to 95 percent of the base inside diameter noted in Appendix XI of ASTM C3034 for PSM PVC pipe (SDR pipe) and calculated from Appendix X2 of ASTM F679 for PS 46 or 115 pipe.
 - b. Mandrel shall be constructed of rigid steel, be non-adjustable, and have an odd number of legs (9 legs minimum). Its effective length shall not be less than its nominal diameter.
5. Deflection Template/Bar Requirements
 - a. The circular template diameter (or rigid bar length) shall be equal to the mandrel diameter requirements as determined above.
 - b. Circular templates shall be constructed of rigid materials and be non-adjustable.
 - c. Rigid bars shall have a 1 inch diameter circular section, be constructed of steel, and be non-adjustable.

3.03 REQUIREMENTS FOR TEST FAILURES

A. Pressure or Leak Test Failure

1. Repair piping as necessary to conform to product requirements.
2. All repair work shall be subject to approval by the Engineer.
3. Chemical type sealants added to the test water will not be permitted.
4. The Engineer may require removal and replacement of pipe in failed test sections.
5. The cost of replacement, repair, and re-testing of failed pipe sections shall be borne by the Contractor.

B. Deflection Test Failure

1. Unless otherwise permitted by the Engineer, any over deflected pipe shall be uncovered, and if not damaged, reinstalled. Damaged pipe shall not be reinstalled, but shall be removed from the Site.

3.04 SANITARY SEWER CLOSED CIRCUIT TELEVISION INSPECTION

A. General

1. Televising shall be performed on all newly constructed gravity sanitary sewer lines after successful leak testing has been completed and accepted.
2. The sewer contractor shall assist with providing access to all sanitary sewer lines after successful leak and deflection testing has been completed and accepted.
3. Format – The video will be submitted on a jump drive with both audio and video.
4. Camera – The camera will be a self propelled unit providing color video with the ability to tilt up and down and pan left to right. The camera lens shall be capable of turning and looking up each wye or service tap to a minimum distance of the first fitting of the service pipe. The camera is to provide color video and still photographs of any defect.

B. Line Requirements

1. All lines shall be jetted and vacuumed so that all debris has been removed prior to televising.
2. Each run will consist of a starting and ending Manhole Number, line size, and a zero reading on the counter at center of the starting manhole.
3. Each service wye shall be examined using the pan and tilt feature.
4. The video camera operator shall type into the video the station, wye location on either the left or right side of the pipe and any problems they notice while televising the sewer lines.

C. Manhole Requirements

1. Examine starting and ending doghouses for quality of mortar work.
2. Examine all joints to confirm watertight quality of gaskets and seals.
3. While at the bottom of the manhole, the camera will examine for infiltration as high as it can see around the entire manhole circumference.
4. Examine vertical outside drops.

D. Report Requirements

1. A technician shall observe the monitor at all times during the televising and record the data.
2. Note locations, length and depth of any sags in the pipe (indicate any depths greater than 1/2 inch).
3. Note locations, length and depth of any areas of dirt or debris in the pipe (indicate any depths greater than 1/2 inch).
4. Record distance from center of manhole to center of manhole.
5. Note each change in pipe material, including station.
6. Note each wye or service tap location with station and orientation (Example: wye right, 3 o'clock).
7. The complete report and jump drive shall be submitted to the City.
8. Include photos/images of defects in the written report.

E. Defects

1. Any defect, faulty joints, cracked pipe or other deficiency noted by the television inspection shall be immediately corrected by the Contractor.
2. Plan for repair shall be presented to the City prior to the repair occurring.
3. The repaired segment shall then be re-televised from manhole to manhole with a report. No additional compensation shall be awarded for re-televising any repairs or defects in the lines.