City of Poulsbo

Engineering Division-Memorandum

To: Engineering and Public Works Staff
From: Michael Bateman, Senior Engineering Technician
Subject: Sewer pipe specifications and inspection
Date: September 9, 2015

Subsequent to a question raised by a local contractor regarding sewer pipe installation tolerances, a thorough review of the WSDOT Specification for pipe laying was undertaken, and other nearby jurisdictions were consulted on their pipe laying specifications.

The specification used by the City of Poulsbo for sewer pipe is the WSDOT 2014 Standard specifications M41-10, and the pertinent section of that specification is 7-08.3(2)B (reproduced below – highlights are mine).

7-08.3(2)B Pipe Laying – General

After an accurate grade line has been established, the pipe shall be laid in conformity with the established line and grade in the properly dewatered trench. Mud, silt, gravel, and other foreign material shall be kept out of the pipe and off the jointing surfaces.

All pipe laid in the trench to the specified line and grade shall be kept in longitudinal compression until the backfill has been compacted to the crown of the pipe. All pipe shall be laid to conform to the prescribed line and grade shown in the Plans, within the limits that follow.

Pipe shall be laid to a true line and grade at the invert of the pipe and the Contractor shall exercise care in matching pipe joints for concentricity and compatibility. In no case shall two pipes be joined together with ends having the maximum manufacturer's tolerance. The invert line may vary from the true line and grade within the limits stated to develop uniformity, concentricity, and uniform compression of jointing material provided such variance does not result in a reverse sloping invert. The limit of the variance at the invert shall not exceed plus or minus 0.03 feet at the time of backfill. Checking of the invert elevation of the pipe may be made by calculations from measurements on the top of the pipe.

The pipe, unless otherwise approved by the Engineer, shall be laid up grade from point of connection on the existing pipe or from a designated starting point. The pipe shall be installed with the bell end forward or upgrade. When pipe laying is not in progress, the forward end of the pipe shall be kept tightly closed with an approved temporary plug.

Where pipe joints must be deflected within the manufacturer's recommended limits to accommodate required horizontal or vertical curvature, it shall first be joined in straight alignment and then deflected as required.

Where pipe joints must be deflected to an amount greater than the manufacturer's recommended limits to accommodate required horizontal or vertical curvature, the curves shall be achieved with a series of tangents and shop fabricated bends, subject to the approval of the Engineer.

Upon final acceptance of the Work, all pipe and appurtenances shall be open, clean, and free draining.

There are two parts to the specification, deviation from true line and grade and reverse sloping invert. The first highlighted section indicates the tolerance from true line and grade is plus or minus 0.03 feet (0.36 inches), and that it may be measured at the top of the pipe at time of backfill. Plus and minus 0.03 feet means

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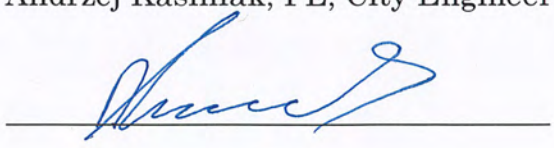
that a total deflection of 0.06 feet (0.72 inches) may be tolerated assuming maximum deviations in both directions from true line and grade. However, the specification also states that such variance may not result in a reverse sloping invert.

This concept is restated in the final sentence of that section, indicating that for final acceptance, all pipe and appurtenances shall be open, clean and free draining. This further clarifies that in no case shall any reverse slope at the invert be allowed, and that condition shall be met not only at the time of backfill but at final inspection as well.

With this specification, it is clear that no reverse slope in the invert at any point of the pipe can be tolerated, both at installation and at time of final inspection. When surveyed, both Port Orchard Public Works inspectors and City of Bainbridge Island Public Works Inspectors stated that their jurisdictions interpretation of their sewer pipe specifications are similar. No reverse slope of any invert is allowed. In both cases this is verified by video inspection showing no standing water at any point in the pipe(s).

As such – when viewing video inspection records of sewer pipes for City of Poulsbo acceptance of both public and private sewer projects where the pipes will be dedicated to the City of Poulsbo, no pipe bellies that hold any standing water will be allowed, and this shall be verified by video inspection records of all pipe runs prior to City acceptance.

Approved by: Andrzej Kasiniak, PE, City Engineer



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