WLSSD Policy for Installation of Sanitary Sewer Pipelines

1. Design and Construction Standards

It is the Policy of WLSSD ("the District") to follow the City Engineers Association of Minnesota Standard Utilities Specifications (CEAM), Sections 2600 and 2621 when designing and constructing new sanitary sewer pipelines. The District requires that local communities follow these guidelines when designing and constructing sanitary sewers that connect to WLSSD Interceptors. The CEAM documents have been modified by the District to include the supplemental standards and specifications listed below. Conformance with the CEAM standards and supplements shall be acknowledged by completing the attached checklist.

Supplements to City Engineers Association of Minnesota Standards for Local Sewer Construction

1. Trench backfill compaction requirements and testing standards
2. Manholes - Requirements for watertight pipe to manhole connections
3. Corrugated metal pipe (CMP) and cast iron soil pipe (CISP) are not acceptable materials for sanitary sewer construction.
4. Leakage testing of manholes

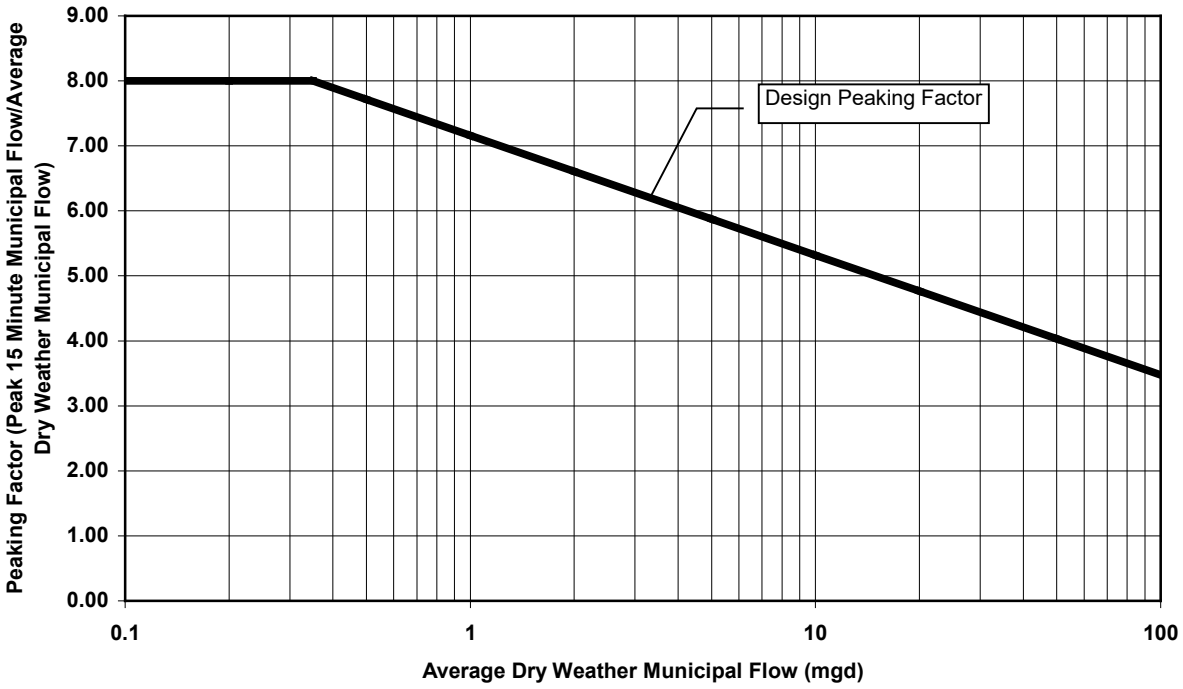
Supplements to City Engineers Association of Minnesota Standards for WLSSD Sewer Construction

1. Specifications for pipe abandonment
2. Specifications for pipeline cleaning
3. Specifications for CCTV inspection
4. Specifications for pavement restorations (base and surface course standards)
5. Specifications for protection of natural resources (trees, plants, etc.)
6. Specifications for street cleaning requirements
7. Specifications for on-site storage procedures for pipeline installation
8. Specifications for direct jacking of sewer pipe
9. Specification for reinforced plastic mortar pipe
10. Specifications for epoxy mortar, lean/lightweight concrete fill
11. Specifications for manhole base anchoring requirements
12. Specifications for pipe coupling standards
13. Specifications for slip-lining
14. Specifications for cured-in-place lining
15. Specifications for leakage testing of manholes

2. Municipal Peak Flow Standard

WLSSD interceptors and local sanitary sewers that connect to WLSSD interceptors shall be designed with sufficient capacity to convey peak municipal and peak industrial flow. The design peaking factor for municipal flow shall be in accordance with Figure 1. The design peaking factor for industrial flow shall be based on peaking factors estimated for the specific industrial sources.

Figure 1. Municipal Peak Flow Standard



3. Full-time Inspection of Sewer Installations

   a. It is the policy of the WLSSD to require a full time construction inspector on District construction projects. In addition, the District requires full-time construction inspection during construction of all local sewers that connect to WLSSD Interceptors that meet any of the following criteria:
      i. All trunk sewers 10" in diameter or greater that exceed 1000 feet in length.
      ii. All trunk sewers that will eventually have ownership turned over to the District.
      iii. Where sewer is to be constructed under special circumstances such as:
         - Laying pipe through wetlands or seasonally saturated hydric soils
         - Laying pipe into solid bedrock
         - Any location where tunneling will be required
         - Any location where bridging of pipe will be required

4. Resident Inspector Duties for Full-time or Part-time Status

    a. At a minimum, the following resident inspector duties will be required on all District construction projects and for all local communities constructing sewers that meet the criteria set forth in Section 3 above:
        i. Materials used for construction are as specified in the design documentation.
        ii. Pipe is laid to correct line and grade.
        iii. Pipe is bedded with compaction as specified in the design documentation.
        iv. Joints are properly made and watertight. Pressure and leak testing is performed and as specified in the design documentation.
        v. Pipeline is backfilled and compacted according to design documentation.
        vi. Manholes and other structures are installed in accordance with design documentation.
        vii. Closed circuit televising of new sewer construction

    b. In addition to the resident inspector's presence, the District shall be notified in advance of all connections to WLSSD interceptors so that a District representative can be present to observe the work. Individual municipalities shall be contacted prior to the initial connection of laterals to the public sewer and the building, so that a representative of the municipality may be present to observe the work.

5. Closed Circuit Televising (CCTV) of New Sewer Construction

    a. CCTV will be required for all District construction projects and for all local community sewer construction projects, except as provided in subpart d. below. CCTV inspection will also be required for all sections of pipe rehabilitated with liners.

    b. CCTV will be performed as specified in the design documents and will require the presence of the resident inspector for the duration of the event.

    c. For large diameter sewers, visual inspection and a summary report of the pipe condition may be substituted for the CCTV requirement.

    d. CCTV will not be required for continuous or welded joint pipe less than 8 inches in diameter. If CCTV is not feasible, an alternative plan for quality assurance will be presented for approval by WLSSD.

6. Use of Polyvinyl Chloride Products

    In accord with WLSSD's goal to eliminate persistent bioaccumulative compounds such as dioxin in our environment, the WLSSD will not specify polyvinyl chloride (PVC) plastic products for any new material need or for significant or substantial material upgrades, replacement, or revisions, unless the alternatives do not meet required product performance or safety specifications. PVC may be specified for minor applications, such as small repairs or replacement, provided PVC is required for continuity of existing infrastructure or is a normal component of standard manufactured equipment.

The WLSSD encourages its municipal and industrial users to adopt similar policies to restrict or eliminate the use of PVC products.

Attachments:

1. Supplemental Specifications for Trench Backfill and Manhole Installation
2. WLSSD Checklist for Sanitary Sewer Design Submittals

Supplemental Specifications

Trench Backfill

1. Add to section B4, page 12, paragraph 2: "Removal of sheeting, shoring, or bracing from the trench shall not disturb compacted backfill around pipe."

2. Add to section E, page 16, paragraph 6: "Trench and pit excavations shall be backfilled with materials as listed in the project specifications. The Contractor shall not proceed with backfill placement in excavated areas until the subgrade has been inspected by the resident inspector. Pipe zone backfill material shall be placed from the sewer subgrade to the outside bottom of the sewer pipe, leveled and compacted. Bell holes shall be excavated at each pipe joint to permit proper inspection and uniform bearing of pipe on pipe zone backfill material.

   After the pipe and/or appurtenance has been installed to the proper line and grade, inspected by the resident inspector, the pipe zone backfill shall be installed around the pipe, in uniform, 6-inch maximum lifts, from the outside bottom of the pipe to a point 12 inches above the outside top of the pipe barrel. No jetting shall be allowed. The pipe embedment material shall be hand shovel sliced around the pipe before compaction to ensure the absence of voids beneath the pipe haunches.

   All bedding material shall be seated by mechanical compaction, as specified in the project specifications. A minimum of four passes uniformly over the material surface shall be performed.

   In unimproved areas, the top 12 inches of soil shall be removed, stockpiled, and kept segregated from other excavated materials. Trench zone backfill shall be placed and compacted as specified above the pipe zone to within 12 inches of original ground surface. The stored topsoil shall then be placed at a uniform depth over the compacted trench zone materials in its original area and compacted to its original condition."

3. Add to section E, page 17, paragraph 2: "Compaction testing of trench zone materials within unpaved areas shall be done in compliance with ASTM D1557 (Modified Proctor Test). Maximum or relative densities refer to dry soil densities obtainable at optimum moisture content."

Manhole Installation

1. Add to section C, page 47, paragraph 1: "The flexible boot pipe connections shall be integral to the manhole and be similar to those manufactured by NPC and Press-Seal Gasket Corp. O-ring style waterstops are not permitted. For cast-in-place manholes, provide a neoprene waterstop for all pipe connections. The waterstop shall be firmly fitted around the pipe exterior and cast into the manhole using a non-shrink grout."

2. Add to section E, page 47, new paragraph: "For installations subject to high hydrogen sulfide concentrations, a 100 percent solids epoxy mortar shall be used to coat all areas

exposed to sewage gases such as manhole base shelves and channels to protect the concrete from corrosion."

3. Add to section D, page 52. paragraph 2: "In paved areas, the Contractor shall set the manhole rim after backfill and site settlement to match the proposed finish pavement elevation."

4. Add to section D, page 53, new paragraph: "For connection to existing manholes, Contractor shall core drill openings where new pipes are to connect. After connection using an approved resilient connector, the Contractor shall rechannel the inside of the existing manhole base to provide a smooth flow channel to the new exit pipe. Using mortar as specified in the Materials section, the top of the base shelf shall be troweled to slope towards the channel at an approximate slope of 1 inch in 6 inches. The Contractor shall plug any holes remaining from abandoned lines as specified in the project specifications."

WLSSD CHECKLIST
FOR SANITARY SEWER DESIGN SUBMITTALS

PROJECT LOCATION_____
PROJECT TITLE_____

Check Off (√)	Description	Comments
_____	1. General conformance with City Engineers Association of Minnesota Standard Utilities Specifications (CEAM)	
_____	2. Conformance with Municipal Peak Flow Standard	
	3. CEAM Section 2600 – Excavation/Restoration	
_____	a. Materials and foundation support	
_____	b. Construction Requirements including general provisions, materials disposal/reuse foundation requirements, and excavation limits/requirements. • Excavate 4" below proposed invert for granular bedding of pipe. • Width of pipe plus 2 ft for trench bottom • Sheeting, shoring, and bracing per applicable regulations.	
_____	c. Trenchless installation requirements for jacking, boring, or tunneling, if applicable.	
_____	d. Restoration to existing conditions including pavement and turf.	
_____	e. Maintenance and final cleanup requirements	
	4. CEAM Section 2621 – Sewer Installation	
_____	a. Pipe materials conformance: Indicate type_____, precast MH, CB, and casting conformance.	
_____	b. Pipe installation requirements including placement, connection, appurtenances, structures, testing, and inspection.	
_____	c. Testing Requirements • Leakage testing by Air Test Method or Hydrostatic Method. • Deflection Test for flexible pipe.	

- Remedies for test failures.

5. Supplemental Requirements (See Attached)

_____ a. Full time inspection conformance, if applicable

_____ b. CCTV inspection conformance

_____ c. Trench backfill materials, compaction and testing

_____ d. Manhole installation:
   1. Flexible boot connectors for precast.
   2. Coatings for MH interiors (High Corrosion).
   3. Rim elevations match finish pavement.
   4. Connections to existing MH.

_____ e. Leakage testing of manholes (hydrostatic or vacuum)

ENGINEER

Signature: _____ Reg. No._____

Printed: _____