

SANITARY SEWER STANDARDS
URBANA & CHAMPAIGN SANITARY DISTRICT
AND
AFFILIATED COMMUNITIES
CHAMPAIGN
URBANA
SAVOY

Prepared by:
Intergovernmental
Joint Sanitary Sewer Technical Committee
April 12, 2000

Introduction

The Intergovernmental Agreement Regarding Sanitary Sewers, which was adopted in 1992 by the Urbana & Champaign Sanitary District (District), the City of Champaign, City of Urbana and Village of Savoy, provided for the creation of a Sanitary Sewer Technical Committee charged with the responsibility of coordinating and implementing certain responsibilities set forth in that Agreement. One of those responsibilities is to control connections to, and set standards for construction of, all municipal sanitary sewer systems tributary to the District. To that end, the Technical Committee adopted a set of standards in December, 1994.

This document represents the first major revision to those 1994 standards, incorporating policy and technical changes that expand and clarify the practices and requirements that apply to all sanitary sewers within the District.

It is the Sanitary Sewer Technical Committee's intent through these standards that it is clear to the development, architectural and engineering community what the District and each community's standards are. This will result in consistent plan and specification submittals and simplify installation methods and expectations for contractors.

Urbana & Champaign Sanitary District

By: _____
Executive Director

City of Urbana, Illinois

By: _____
Public Works Director

City of Champaign, Illinois

By: _____
City Engineer

Village of Savoy, Illinois

By: _____
Village Administrator

SANITARY SEWER STANDARDS

100.00 PIPE MATERIALS

Pipe materials used for sanitary sewers shall conform to the following materials which are expressly manufactured for transmitting sanitary sewage and shall comply with requirements of the Illinois Environmental Protection Agency:

Extra strength vitrified clay per ASTM C700, ductile iron per AWWA C150, gasketed PVC truss pipe per ASTM D2680, PVC profile pipe (18-inch diameter and larger) per ASTM F949 or ASTM F1803, and others approved by the Executive Director of the UCSD with the concurrence of the approving authority.

For trenchless construction, materials and methods will be approved on a case-by-case basis by the approving authority.

110.0 MANHOLES

Manholes shall comply with minimum standards in the "STANDARD SPECIFICATIONS FOR WATER AND SEWER MAIN CONSTRUCTION IN ILLINOIS" and shall be a minimum of 48 inches in diameter.

111.0 DROP MANHOLE CONNECTIONS

All drop manhole installations, including service lines, may be installed as either internal or external to the manhole structure, except for UCSD interceptor manholes which shall have only external drop assemblies. All drop assemblies shall comply with the appropriate provisions and details in the "STANDARD SPECIFICATIONS FOR WATER AND SEWER MAIN CONSTRUCTION IN ILLINOIS". Internal drop assemblies will only be allowed if the clearance requirements specified in the IEPA "ILLINOIS RECOMMENDED STANDARDS FOR SEWAGE WORKS" are met. Internal drop assemblies will not be allowed in manholes 48 inches in diameter or smaller. In addition, the location and details of proposed internal drop assemblies must be approved by the approving authority prior to initiation of construction.

112.0 TERMINAL MANHOLE CONNECTIONS

Manholes at the upstream end of dead-end lines shall be constructed so that influent service connections are only attached to the manhole at the upstream side. Further, there shall be a minimum of 4 inches of elevation difference from the invert of the service connection to the invert of the outlet pipe. There shall also be a concrete channel constructed from the invert of the service connection to the channel of the bench outlet pipe. Details of the connection shall be approved by the appropriate agency prior to initiation of construction.

113.00 CONNECTIONS TO EXISTING MANHOLES

New connections made to any existing manhole shall be angled in the direction of flow, and shall be accomplished by core drilling through the wall of the manhole and installing an appropriately sized connector boot, such as *KOR n SEAL*® by NPC Inc., or approved equal.

114.0 UCSD INTERCEPTOR MANHOLE REQUIREMENTS

Manholes constructed on UCSD interceptor sewers shall conform to the "UCSD Interceptor Sewer Manhole Detail" attached to these Sanitary Sewer Standards.

120.00 SERVICE LATERALS

Service laterals and clean-outs shall be constructed of materials which comply with Section 100 of this document, plus those specifically outlined in the UCSD Ordinance, which includes PVC lines which meet

Appendix A: Sanitary Sewer Standards

ASTM D-2034, SDR-35, and ABS pipe which meets ASTM D-2680. If laterals are constructed of 6-inch pipe, they shall have a minimum slope of 1/8 inch per foot. 4-inch pipe shall have a minimum slope of 1/4 inch per foot. All laterals shall be installed at a depth to serve the building it is designed to serve, but shall have a minimum cover of 42 inches unless otherwise approved on a case-by-case basis by the approving authority.

The end of the pipe shall be at no deeper than 7 feet below the existing grade and shall be staked with a 2 x 4 wood leader which extends to 1 foot above the ground.

121.0 CITY OF CHAMPAIGN

Each service connection must comply with the requirements of Section 120.00 and shall be installed to the property line.

122.0 CITY OF URBANA

Each service connection must comply with the requirements of Section 120.00 and shall be installed no closer than 5 feet to any property corner.

123.0 VILLAGE OF SAVOY

Each service connection must comply with the requirements of Section 120.00 except as modified in this Section. The minimum size shall be 6-inch and the line shall be placed to the property line.

130.00 PIPE BEDDING, HAUNCHING & INITIAL BACKFILL

Allowable materials for pipe bedding, haunching and initial backfill to 12 inches above the top of the pipe shall be one of the following materials: CA-6, CA-7, CA-9, CA-11, CA-13, CA-16, FA-5, FA-6, or FA-10, except in Savoy where FA-5 and FA-6 is not acceptable. Previously excavated material is not an allowable material, unless the material has been tested, at intervals and frequencies acceptable to the approving authority, by a certified laboratory and shown to meet the gradation requirements for one of the specified aggregate materials.

140.00 PIPE CONNECTIONS

141.00 WYES

Sewer wyes must be of the same material as the main-line piping, must comply with appropriate provisions of the "STANDARD SPECIFICATIONS FOR WATER AND SEWER MAIN CONSTRUCTION IN ILLINOIS" and shall be encased in granular bedding conforming to Section 130.00, except for the Village of Savoy where concrete encasement is required in lieu of granular encasement. Concrete encasement is not allowed elsewhere.

142.0 CONNECTIONS TO EXISTING SEWERS

If a connection is to be made where there is no wye, and the existing piping is smaller than 12 inches in diameter, a section of pipe shall be removed and a wye inserted with pipe couplings, conforming to Section 143.00, and new sections of pipe as needed. New connections to existing piping 12 inches in diameter or larger shall be made by core drilling the existing pipe and installing a flexible connector assembly such as *KOR n SEAL*® by NPC Inc., or approved equal. In the City of Urbana only, saddles may also be used on City Sewers 12 inches in diameter or larger, and if used shall be provided with 6 inches of concrete encasement. Saddles shall be properly supported in a granular base to minimize settlement.

143.00 PIPE COUPLINGS

Pipe couplings shall conform to the applicable portions of ASTM C-425, C-443, C-564, C-1173, and D-1869. They shall be made of elastomeric polyvinyl chloride, shall be specifically sized to fit the outer diameter of the pipes being joined, and shall have stainless steel take-up clamps to fit the appropriate outer diameter of the coupling. The take-up clamps shall be tightened to the manufacturers recommended torque value and the joints tested in accordance with Section 160.00, and the manufacturer's recommendations. Testing may be waived at the discretion of the approving authority, provided that the installation passes visual inspection. After the connection has been inspected, tested where required, and approved by the approving authority, the entire connection shall be encased in granular fill to a minimum of 6 inches all around.

150.00 BACKFILL

Where the inner edge of the trench is within 2 feet of the edge of the pavement, curb, gutter, curb and gutter, stabilized shoulder or sidewalk, the sewer trench must be backfilled with CLSM meeting the approving authority's specifications, or granular trench backfill, placed in uniform layers not exceeding 6 inches thick (loose measure) and compacted to 95% of Standard Proctor unless flowable fill is used, in which case, the fill shall be designed to have a compressive strength between 100 to 200 psi. For Urbana only, CLSM backfill is required within 2 feet of the back of curbs for all arterial streets.

Jetting and water-soaking is not allowed.

Outside of the pavement area, native soil may be returned to the trench, in accordance with the requirements of "STANDARD SPECIFICATIONS FOR WATER AND SEWER MAIN CONSTRUCTION IN ILLINOIS", but the developer and/or contractor is responsible for repair of all settlement which occurs.

160.0 TESTING

Testing shall comply with provisions of the "STANDARD SPECIFICATIONS FOR WATER AND SEWER MAIN CONSTRUCTION IN ILLINOIS" with the following exceptions: 1) the maximum leakage shall be 200 gpd/in. dia./day/mile of pipe instead of 240, 2) all reaches shall be tested, and 3) the specified air test times in the "Air Test Table" for 8, 10 and 12-inch pipe shall be modified so that test times for pipe lengths greater than 100 feet shall be incremental multiples of the time indicated for the 100 foot length.

170.00 LAMPING

All main lines must be capable of transmitting a full circle of light between manholes. If the light cannot be seen, the sewer must be capable of passing a two-foot long cylinder, which has a diameter 1 inch less than the inside diameter of the pipe being tested.

180.00 PAVEMENT REPAIRS

All pavement repairs must meet requirements of the local agency which has jurisdiction.

181.00 CITY OF CHAMPAIGN PAVEMENT REPAIRS

For projects within the jurisdiction of the City of Champaign, all disturbed street and sidewalk areas shall be replaced in accordance with Section 442 of the IDOT Standard Specifications, with the following exceptions and additions.

All pavement shall be replaced to its original thickness, material type or types, and grade with the following exceptions and additions:

1. Required Permit: Any work in the public right-of-way requires a permit and a description of that work shall be submitted in writing to the right-of-way inspector.

2. Minimum Thickness: If the old pavement was deficient, it must be replaced to current standards and thickness [concrete pavement minimum thickness is 8 inches, non-reinforced, bituminous pavement minimum thickness is 10 inches.]
3. Concrete Pavement Repair: All concrete patches shall be a modified IDOT Class C patch as shown on the attached drawing, with the exception of patches on Arterial and Major Collector streets (defined by the right-of-way inspector). The Arterial and Major Collector streets 8 inches or greater in depth shall be repaired using a modified IDOT Class B patch as shown on the attached drawing. One-inch deformed reinforcing bars shall be substituted for smooth dowels at any new mid-panel joint. Smooth dowel bars shall be used at any pre-existing contraction joint. Pre-existing contraction joints shall be replaced with an appropriate grooving tool. Concrete patch width shall coincide with the edge of full panels and shall have a minimum longitudinal distance of 6 feet. In large cuts, full panels shall be removed and replaced.
4. Full Depth Bituminous or Composite Pavement Repair: A preferred alternative to a full depth, 10-inch, multi-layer bituminous repair, is to construct a minimum of an 8-inch concrete base course, overlaid with a 2-inch hot-mix asphalt surface course.
5. Oil and Chip: Oil and Chip pavements shall be replaced with an 8-inch CA-6 compacted crushed stone base course, overlaid with a 3-inch hot-mix asphalt surface course.
6. Brick Streets: Brick streets shall be re-laid with original brick pavers on a one-inch sand cushion over a new 6-inch concrete base course. Sand shall be deposited over and between laid pavers and vibrated into place with a vibrating plate compactor. Damaged pavers shall be replaced with matching replacement pavers.
7. Pavement Removal: All pavement removals shall be accomplished with a full depth saw cut. A minimum 2-foot bench shall be maintained on all sides of an open excavation. Subgrade shall be compacted to the satisfaction of the right-of-way inspector and if necessary, repaired with granular backfill as instructed by the inspector.
8. Road Closure: Any road closure shall be coordinated with the City of Champaign right-of-way inspector at least 72 hours in advance.

182.00 CITY OF URBANA & VILLAGE OF SAVOY

182.10 NEW PROJECTS

On projects involving new street construction, the street must be constructed in accordance with plans and specifications which have been approved by the City Engineer.

182.20 RENEWAL PROJECTS

Where sewer construction or reconstruction involves cutting existing concrete pavement, the pavement shall be replaced in-kind with the total thickness 2 inches greater than existing to a maximum of 10 inches. Where the surface is asphalt or oil and chip, a 6-inch concrete base shall be used and 2 inches of bituminous concrete shall be placed over the base.

As an alternative, the contractor shall be allowed to pour a full pavement depth of concrete with a black-colored surface to match the black color of the existing bituminous street pavement per the "PC Concrete Pavement Removal & Replacement" City detail. In general, these patches shall be no larger than 10 feet by 10 feet. However, for long and narrow patches, longitudinal and/or transverse joints shall be installed to match the joints in the existing pavement, or per IDOT specifications.

Appendix A: Sanitary Sewer Standards

The surface of these patches shall be tinted black with a shake-on coloring during finishing in order to blend in with the existing bituminous surface and shall be approved by the City Engineer.

Brick pavement shall be replaced with a 6-inch concrete base, ½-inch sand cushion and brick surface. Replacement bricks shall be new and of the same dimensions, color and quality of those existing and all other materials must meet appropriate IDOT requirements.

190.00 MINIMUM CONSTRUCTED SLOPES FOR SANITARY SEWER INSTALLATION

The following tables list a penalty system that may be used for sanitary sewer lines that are installed at less than minimum slopes. The use of this penalty system is at the sole discretion of the given jurisdictional body.

191.00 PENALTY SYSTEM

8-Inch Diameter Line (standard designed @ 0.40%)

Constructed Slope* (%)	Penalty (%)	Velocity Range (ft/s) Kutter's Formula	Velocity Range (ft/s) Manning's Formula
≥ 0.38 but < 0.40	0	1.95 to 2.00	2.13 to 2.19
≥ 0.36 but < 0.38	25	1.89 to 1.95	2.08 to 2.13
≥ 0.34 but < 0.36	50	1.84 to 1.89	2.02 to 2.08
< 0.34	Remove and Replace	0.00 to 1.84	0.00 to 2.02

8-Inch Diameter Line (terminal 700 ft designed @ 0.60%)(velocities @ 1/3 depth of flow)

Constructed Slope* (%)	Penalty (%)	Velocity Range (ft/s) Kutter's Formula	Velocity Range (ft/s) Manning's Formula
≥ 0.58 but < 0.60	0	1.91 to 1.94	2.15 to 2.19
≥ 0.56 but < 0.58	25	1.87 to 1.91	2.12 to 2.15
≥ 0.54 but < 0.56	50	1.84 to 1.87	2.08 to 2.12
< 0.54	Remove and Replace	0.00 to 1.84	0.00 to 2.08

10-Inch Diameter Line (standard designed @ 0.28%)

Constructed Slope* (%)	Penalty (%)	Velocity Range (ft/s) Kutter's Formula	Velocity Range (ft/s) Manning's Formula
≥ 0.26 but < 0.28	0	1.91 to 2.00	2.05 to 2.13
≥ 0.24 but < 0.26	25	1.83 to 1.91	1.97 to 2.05
≥ 0.22 but < 0.24	50	1.76 to 1.83	1.88 to 1.97
< 0.22	Remove and Replace	0.00 to 1.76	0 .00 to 1.88

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12-Inch Diameter Line (standard designed @ 0.22%)

Constructed Slope* (%)	Penalty (%)	Velocity Range (ft/s) Kutter's Formula	Velocity Range (ft/s) Manning's Formula
≥ 0.19 but < 0.21	0	1.87 to 2.00	1.98 to 2.08
≥ 0.18 but < 0.19	25	1.82 to 1.87	1.92 to 1.98
≥ 0.17 but < 0.18	50	1.77 to 1.82	1.87 to 1.92
< 0.17	Remove and Replace	0.00 to 1.77	0.00 to 1.87

192.00 PENALTY SYSTEM USE GUIDELINES

The owner's/developer's engineer may appeal the penalties if a detailed analysis can show that upstream/downstream flow conditions or other factors contribute to increased flows in the sewer reach in question. The jurisdictional body may choose not to allow the use of this penalty system in lieu of removal, if the jurisdictional body determines that upstream or downstream conditions are such that they contribute to reduced flows in the sewer reach in question.

The decision to allow the use of the penalty system outlined herein is at the sole discretion of the jurisdictional body.

The penalties shall be assessed in the form of non-refundable cash, in an amount determined from the official contractor's bid, or the replacement cost as determined by the jurisdictional body per industry standard prices.

If a sanitary system is laid at less than minimum slopes of 0.4% for 8-inch, 0.21 % for 10-inch, 0.28% for 12-inch, etc., the given jurisdictional body reserves the right to require full removal and replacement. Full removal and replacement shall include removing the substandard portion of the sewer main system and replacing it in its entirety. This work shall include required manholes, piping, bedding, haunching, backfill, grading, seeding, and all appurtenances and requirements associated with a sanitary sewer system installed within the Urbana-Champaign Sanitary District.

The following guidelines shall be used when considering the acceptance of substandard sanitary lines and the possible use of the penalty system:

- It is the intent to follow the design requirements of all applicable regulatory agencies.
- Was there adequate observation by the Engineer?
- Was there adequate field documentation by the engineer? Adequate field documentation is considered to be a daily field report sheet or construction diary entries, including elevation checks entered into a field survey book. This documentation will be used to verify the other criteria listed herein.
- Was an observer on site a minimum of 75% of the time during construction?
- Were adequate elevation checks made by the engineer? A minimal level of inspection would include one check per morning and one check per afternoon or a minimum of every 100 feet; which ever is more intensive. Elevation checks should also be made at the initial "start" or "restart" of pipe laying, within the initial 20 to 30 feet.
- Evaluation should be made of the Contractor's overall performance history.

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- Evaluation should be made of the number of requests the Contractor has made for acceptance of substandard construction over the previous 5 years.
 - 0 to 1 instances – eligible
 - 2 to 3 instances – marginal
 - greater than 3 instances – not eligible.

Evaluation should be made of the Contractor's performance in the context of the direction given by the engineer on the project in question.

Appendix A: Sanitary Sewer Standards



