

SECTION 001
DESIGN CRITERIA FOR SANITARY SEWERS

1.0 Design Standards

Sizes of sewers, slopes, capacities and other limiting factors shall comply with the requirements of the latest edition of the State of Illinois Rules and Regulations, Title 35: Environmental Protection, Subtitle C: Water Pollution, Chapter II: Environmental Protection Agency, Part 370: Illinois Recommended Standards for Sewage Works. Design of sanitary sewers shall also comply with the Standard Specifications for Water and Sewer Main Construction in Illinois, latest edition.

Certain design criteria modifications within these limits are required by The Greater Peoria Sanitary District as follows:

2.0 Plans, Specifications and Permits

- A. Two sets of preliminary plans and IEPA permit applications shall be submitted to the Engineer of the Sanitary District for inspection and revision as necessary. One preliminary plan and IEPA permit application shall be returned and corrections or additions shall be made as indicated for final submission.
- B. Four approved sets of plans and supplemental specifications, as necessary, shall be submitted to the Engineer of The Greater Peoria Sanitary District, together with copies of the IEPA permit applications signed by the Design Engineer and the Owner, as required by the Illinois Environmental Protection Agency.
- C. All proposed sewerage projects shall include a plan and profile of the sewers and appurtenances with U.S.G.S. Mean Sea Level Datum elevations. Use of The Greater Peoria Sanitary District General Specifications shall be so stated in the permit application to the Illinois Environmental Protection Agency.
- D. Two copies of the Sanitary District Permit to Construct Trunk Sewers signed by the Owner shall be furnished to the District for final approval of the project design. One copy signed by the Engineer of The Greater Peoria Sanitary District shall be acquired by the Owner or his Agent before any work begins on the project.

3.0 Capacities of Sewers

- A. Sewers shall have a minimum design capacity when running full with $n=0.013$ for service as follows:

10,000 gal/acre/day	for planned Population Equivalent less than 25 P.E./Acre
20,000 gal/acre/day	for planned Population Equivalent between 25 and 50 P.E./Acre and existing trunk sewer capacity permits
- B. Sewers having less capacity than above listed must be first approved by the Sanitary District.
- C. Force Mains shall have, as much as possible, a constant back slope with no low spots in the line. Sections of pipe with zero percent slope are not permitted. High points in the line shall have approved air release valves. Force mains shall be designed with a minimum velocity of 2.0 ft./sec. and, in general, velocities shall not exceed 5.0 ft./sec.

4.0 Slopes of Sewers

A. The minimum slopes of sewers for pipe sizes are required as follows:

<u>Pipe Size I.D. in inches</u>	<u>Slope in feet per 100 feet</u>
6	0.75
8	0.50
10	0.30
12	0.25
14	0.20
15	0.19
16	0.18
18	0.15
21	0.12
24	0.10
27	0.085
30	0.075
33	0.065
36	0.06
42	0.045

- B. Any divergence from these recommended minimum slopes shall be allowed only with the express approval of The Greater Peoria Sanitary District Engineer. Slopes for pipe sizes not listed shall meet IEPA requirements and shall be approved by the GPSD Engineer.
- C. Sewers with maximum velocities exceeding 15 feet per second shall be cradled in not less than four inches of concrete with suitable anchoring on long slopes. Approved ductile iron pipe with mechanical or push on joints may be used without concrete cradle, however, suitable anchoring of the pipe must be provided. PVC pipe shall not be used under these conditions unless approved by the GPSD Engineer.

5.0 Manholes

Manholes shall be installed at the end of each line, at changes in grade, size, or alignment and at distances as follows:

<u>Size of Pipe</u>	<u>Maximum Distance between Manholes</u>
8" to 21" inclusive	400 feet
greater than 21"	500 feet

Greater spacing between manholes may be permitted when approved by the District Engineer but only for special circumstances.

6.0 Lampholes

Lampholes are not permitted.

7.0 Pipe Protection

A. Where sewers are at shallow depths, or subject to superimposed loads or where shown on

the drawings, or where otherwise directed, pipe shall be encased in not less than a 12-inch thickness of concrete measured outside of the bell of the pipe. Ductile iron pipe may be permitted without encasement subject to the approval of the Engineer of the Greater Peoria Sanitary District.

- B. At points of crossing creek beds, ravines, fill sections, or where otherwise directed, the sewer shall be constructed using ductile iron pipe with mechanical or push on joints.
- C. At points of crossing creek beds at shallow depths of 4' or less, pipe shall be encased in not less than 12 inch thickness of concrete measured outside of the bell of the pipe.

8.0 Staking for Sewerage Systems

- A. Construction stakes shall be 2" x 2" x 15" oak, having one end cut on four sides to make a 3-1/2" tapered point. These stakes to be set are to mark the location, alignment, elevation and grade for the sewers and appurtenances.
- B. Guard stakes shall be 1" x 2" x 18", having one end cut on two side to make a 3-1/2" tapered point. These guard stakes are to be used for identification and protection for the construction stakes.
- C. Generally alignment is to be taken from a uniform established parallel off-set line, with the off-set line being identical in lengths to the center line. Stakes set for control points shall be flush with the ground and have definite point set in the top of the stake marking the exact distance. The control stake is to be protected and identified by a guard stake driven alongside the control stake. The guard stake is driven approximately one foot above the ground. The uniform parallel off-set lines are to be staked in 25 foot stationings and the stakes to be driven flush with the ground. They are to be measured accurately and have a tack or nail in the top of the stake to set alignment and distance, and shall be identified by markings on the guard stakes set alongside the grade stakes.
- D. When staking for grade and line to use with a laser, the first 75 feet out of each manhole shall be staked at 25 foot intervals with such additional stakes set as necessary or as directed by the Engineer.
- E. Where it is impossible to use stakes and guard stakes, the following methods shall be approved: in concrete, chisel crosses and paint; in bituminous surfaces, use railroad spikes and paint; in bituminous surfaces over concrete, use concrete nail and bottle cap and paint; other methods may be used upon approval of the Engineer of the Greater Peoria Sanitary District.

All paint shall conform to an approved type that disintegrates in normal weather conditions.

- F. Two approved copies of the staked grade sheets shall be furnished to the Sanitary District Engineering Office before construction of the sewers shall be started.
- G. Temporary benchmarks shall be provided along the proposed sewer alignment at intervals of approximately 800 feet.

9.0 Construction Inspection

Responsible representatives of the Design Engineering Firm or Engineering Inspectors of The Greater Peoria Sanitary District shall be present during all construction to insure the completion of the work in compliance with the approved plans and specifications. Arrangements with the District shall be made not less than 7 days previous to beginning construction to determine who will be

responsible for inspection of the work. A certificate of completion together with record drawings and measurements shall be furnished by the Design Engineering Firm when inspection is made by representative of the Engineering Firm.

10.0 Special Conditions

Special conditions not covered in these general specifications shall be addressed in following order of priority:

1. Any special conditions not covered in these general specifications shall be outlined to The Greater Peoria Sanitary District and approved by its Engineer (as defined by this Document).
2. Latest edition of the State of Illinois Rules and Regulations, Title 35: Environmental Protection, Subtitle C: Water Pollution, Chapter II: Environmental Protection Agency, Part 370: Illinois Recommended Standards for Sewage Works.
3. Latest edition of Standard Specification for Water and Sewer Main Construction in Illinois.
4. Latest edition of Illinois Department of Transportation Standard Specifications for Road and Bridge Construction.

11.0 Location of Public Sewers

As much as possible, new public sanitary sewers shall be located within public right-of-ways. In addition, every effort shall be made to locate manholes within paved areas for ease of access for the Sanitary District's maintenance vehicles. All proposed locations for sanitary sewers shall be reviewed and approved by the Sanitary District.

12.0 Easements

Easements shall be provided for all public sewers not located in public right-of-ways. Easements shall be a minimum of 20 feet wide for sewers 0 to 16 feet deep, a minimum of 40 feet wide for sewers greater than 16 feet to 24 feet deep, and a minimum of 50 feet wide for sewers greater than 24 feet deep. Easements shall use the Sanitary District standard form.

Easements to be recorded as part of a subdivision plat, or plat of a development, must be approved by the Sanitary District's Planning and Construction Department prior to the recording of the plat. Platted easements shall meet the above noted width requirements. Platted easements shall also include the District's standard wording in the Owner's signature block.

No easement shall be recorded without review and approval by the Sanitary District's Planning and Construction Department.

END OF SECTION

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