

GENERAL:

1. To provide minimum standards for Storm Drainage systems.
2. This section applies to stormwater conveyance systems outside the footprint of buildings. Building systems are covered in Section 22 0100.

DESIGN GUIDELINES:

1. Stormwater systems shall be designed using the actual time of concentration. The worst case of complete development, per current planning, or current conditions shall be used for calculation of offsite flow.
2. Generally, the Rational Formula shall be used for areas under 200-acres. Runoff coefficients shall consider percentage of impervious area and average site grade (slope).
3. Design Return Periods:
 - 3.1. 10 years for parking lots, park space, and open areas.
 - 3.2. 25 years for all building sites, pedestrian malls, streets, quadrangles, and storm sewer
Project Manager (PM) will establish "return periods" for all other areas.
 - 3.5. Return period must satisfy governing municipality's regulations. Designer will compare above return periods with those required by the local municipality. Coordination with municipality may be required and should be reviewed with the PM. Any discrepancies will be discussed with the project manager.

- 6.3. Structures over 3-feet from lid to lowest flow line shall include steps. Steps shall be Neenah 1980-J, Deeter 1606, M.A. Industries PS2-PF, or equal.
- 6.4. Manholes shall have eccentric top sections.

7. Trace Wire & Test Stations

- 7.1. MU: Tracer Wire shall be #14 AWG solid, steel core soft drawn high strength tracer wire, 250# average tensile break load, 30 mil High Molecular Weight (HMWPE) or High Density (HDPE) polyethylene jacket complying with ASTM-D-1248, 30 volt rating. Jacket color shall be green. No THHN insulated wire shall be allowed. Tracer wire shall be Copperhead Industries HS-CCS or approved equal. The tracer wire shall be taped to the pipe at the three o'clock position every 5 feet. The tracer wire ends will terminate at a tracer wire test station.
- 7.2. MU: Tracer wire shall have moisture resistant splices for direct bury applications. Splices shall be Copperhead Industries Snakebite or 3M DBR or approved equal.
- 7.3. MU: Tracer Wire test stations shall be installed 2 feet of the manhole or structure in the flow line of the pipe. These test stations shall be designed to be easily detected by magnetic and electronic locators. A magnet shall be securely attached at the top of the upper tube of the box for locating purposes. Lid shall be green and have a brass terminal for attaching locating equipment and a brass 5 sided nut for removing cap. Tracer wire test station shall be Copperhead Industries Snake Pit or approved equal.
- 7.4. MS&T, UMSL and UMKC: Tracer wire shall be #12 THHN attached to top of pipe at 5' intervals. Tracer wire ends to terminate in manhole near the lid with 5' coil of wire.

8. Warning Tape

- 8.1. Install warning tape at least 12" above the top of pipe. Warning tape shall be 100% plastic.

INSTALLATION REQUIREMENTS:

1. Installation Requirements

- 1.1 Piping and fittings shall be installed per manufacturer's instructions and ASTM D2321-20.
- 1.2 Inserta-Tee penetrations into HPP Storm Sewer Pipe shall be made with correctly sized Inserta-Tee core saw.

