Policy 16

STORMWATER PIPE MATERIALS

In order to reduce flooding, promote adequate drainage, and reduce maintenance, the City of Knoxville requires certain pipe materials depending upon usage and location of the pipes. Material for pipe used for conveyance of stormwater within the City of Knoxville shall be in accordance with the following:

- Reinforced concrete pipe (RCP), double-walled high-density polyethylene pipe (HDPE), corrugated double-walled polyvinyl chloride pipe (PVC), corrugated metal pipe (CMP) and non-reinforced concrete pipe (NRCP) may be used to convey onsite stormwater runoff (stormwater runoff generated by the subject property including areas such as buildings, parking lots, etc.).

- Reinforced concrete pipe (RCP) is required for all detention basin outlet structures and for all stormwater outlet pipes that drain through the berm of a detention pond (or water quality facility) continuing to its terminus or the connection to a downstream system.

- Underground detention facilities that do not have a berm associated with their construction may use HDPE for the pipe material downstream of the outlet structure provided that in the event of a failure of the pipe, no offsite properties will be adversely affected.

- Reinforced concrete pipe (RCP) is required when stormwater systems carry water from offsite areas (stormwater runoff generated by areas other than the subject property, where the runoff drains across the subject property) or when there is a potential to cause flooding or damage to adjacent properties. RCP is also required for all stormwater systems located within new residential developments (includes residential condominium developments).

- Stormwater pipes installed under City streets and/or Joint Permanent Easements (JPEs) shall be reinforced concrete pipe (RCP). Stormwater pipes within the roadway prism of City streets and JPEs, but not under the pavement, shall also be of RCP.

- Any stormwater pipe/system that is installed with intent of dedicating to the City, whether inside or outside of the right-of-way, shall be constructed with reinforced concrete pipe (RCP).

- Existing residential subdivisions that have a roadside ditch and driveway pipe stormwater system may use reinforced concrete pipe (RCP), double-walled high-density polyethylene pipe (HDPE), corrugated double-walled polyvinyl chloride pipe (PVC), corrugated metal pipe (CMP) and non-reinforced concrete pipe (NRCP) as desired by the responsible agency, corporation, or individual. RCP is required underneath any driveways or entrances that are heavily traveled.

For the situations referred to above where reinforced concrete pipe (RCP) is required, the Engineering Department may allow ductile iron pipe (DI) to be substituted for RCP when site limitations exist.

Installation Standards

All stormwater pipes must be installed correctly with adequate pipe bedding, backfill and stormwater joint techniques. See the following for proper installation practices:

Reinforced Concrete Pipe (RCP) – ASTM C 1479-01
Double Walled High-Density Polyethylene (HDPE) – ASTM D 2321
Corrugated Double Walled Polyvinyl Chloride (PVC) – ASTM D 2321  
Corrugated Metal Pipe (CMP) – ASTM A 798  
Non-Reinforced Concrete Pipe (NRCP) – ASTM C-14  

All installations must be per ASTM standard or the manufacturers specifications, which ever is more stringent. At a minimum, all pipe installations must have soil tight gasketed joints.  

The following documents are additional references available from the Civil Engineering Division website:  
- City of Knoxville Standard Detail COK-5 (Storm Pipe Bedding and Backfill)  
- City of Knoxville Technical Specifications TS-05 (Mineral Aggregate Base)  
- City of Knoxville Technical Specifications TS-20 (Storm Sewers and Pipe Culverts)