

CHAPTER 9

MISCELLANEOUS

9.10 Culverts and Pipe Collection System Guidelines

9.10.1 Culverts

- 9.10.1.1 Single barrel or single cell culvert structures are less prone to clogging and require less maintenance than multi-barrel or multi-cell installations and should therefore be used whenever feasible.
- 9.10.1.2 The maximum velocity in a corrugated metal culvert for the 100-year flow shall be 15 fps (feet per second). Velocities over 10 fps in a pipe of any material shall be considered a special design with particular attention required to pipe or structure invert protection and to fill slope, stream bed, and stream bank stability.
- 9.10.1.3 The minimum allowable slope shall be in accordance with the Storm Water Design Manual.

9.10.2 Pipe collection Systems

- 9.10.2.1 The maximum velocity in a corrugated metal pipe system for the design flow shall be 15 fps. Velocities over 10 fps in a pipe of any material shall be considered a special design with particular attention required to pipe invert protection and the ability of the receiving waterway or detention facility to accept the flow without damage.
- 9.10.2.2 The minimum allowable slope shall be in accordance with the Storm Water Design Manual.
- 9.10.2.3 The maximum allowable slope for a concrete storm drainage pipe shall be 10 percent, for a corrugated metal pipe shall be 14 percent and for HDPE pipe shall be 14 percent. Greater slopes may be approved if installation is in accordance with manufacturer's recommendations. In cases where the slope is in excess of 10 percent, anchor collars may be required.
- 9.10.2.4 A minimum pipe cover of one (1) foot shall be required.

9.10.3 Outlet Location – Culverts and Pipe Systems

- 9.10.3.1 Outlet structures (such as headwalls) shall not be located closer to the project site's property line with an adjoining property than the greater

of the distance necessary to construct any velocity protection or a flow distance equal to 6 pipe diameters. For non-circular conduits, this distance shall be six times the rise dimension of the conduit.

9.10.3.2 The invert elevation of a culvert or pipe outlet shall be no more than 2 feet above the elevation of the bottom of the receiving watercourse at the outlet.

9.10.4 Discharge of Concentrated Flows

9.10.4.1 The discharge of concentrated flows of stormwater into public roadways shall be avoided. In no case shall such concentrated flows, including flows from swales, ditches, draws, driveways, or piped systems, exceed the allowable peak flow rates in Table 9.10.4.1-1, below.

TABLE 9.10.4.1-1
MAXIMUM FLOWS INTO STREETS

<u>STREET CLASSIFICATION</u>	<u>ALLOWABLE PEAK FLOW RATE FOR A 2-YEAR STORM</u>
Local	2.0 cfs
Minor Collector	1.0 cfs
Other	0.5 cfs

9.10.4.2 In residential subdivisions, the drainage area contributing to the peak flow along any property line between lots within 50 feet of the building setback line for either lot shall not exceed 2 acres, unless contained within a piped drainage system or maintained in a natural watercourse. The storm water conveyance shall be in a drainage easement.

END OF SECTION 9.10