
Drainage Manual Supplement

The following are changes, additions or deletions to the FDOT Drainage Manual, for use on Turnpike projects only.

Chapter 1 - Introduction

1.4 General

Add the following paragraph to this section

The intent of this supplement is to clarify and supplement criteria in the Drainage Manual (DM) (2014), in order to provide additional guidance to the Section Designers in providing the Turnpike with safe, economical designs for roadway drainage and least cost maintenance. Some criteria are intended to address construction and maintenance issues experienced in past projects.

Chapter 2 - Open Channels

2.4.4 Channel Bottom

Replace first paragraph with the following

The minimum channel bottom width is 5 feet to accommodate mitered end sections and maintenance mowers. V-bottom ditches shall not be used if the 5 foot bottom width is feasible, otherwise v-bottom ditches allowed if both the front and back slope are 1:6 or flatter. If neither the 5 foot bottom width nor slopes 1:6 or flatter can be attained, the v-bottom ditch shall be lined with concrete ditch pavement.

Chapter 3 - Storm Drain Hydrology and Hydraulics

3.6.3 Outlet Velocity

Add the following paragraphs to the Section

~~The Energy Dissipator Structure, Index No. 264, should not be used as an end treatment unless supporting calculations justify use.~~

~~The use of sand cement riprap is generally discouraged due to maintenance problems. Sand cement riprap shall only be used with written approval of the Turnpike Drainage Engineer.~~

3.9.2 Spread for Temporary Construction

Add the following paragraphs to the Section

The spread resulting from a rainfall intensity of 4 inches per hour shall not encroach onto the adjacent travel lane for design speeds equal to or greater than 55 mph.

Chapter 4 - Cross Drain Hydraulics

No Additions

Chapter 5 - Storm Water Management

5.3 Design Standards

Add the following paragraph to this section

Facilities designed to be dry, or using underdrains or exfiltration, shall require the appropriate geotechnical analysis. This analysis shall be certified by the project Geotechnical Engineer.

5.3.1.1 General *Add the following to this section*

Base Clearance to the Design High Water (DHW) shall be considered when establishing roadway grades. The DHW for roadside treatment swales shall be set at the weir elevation. A lower elevation may be used if all of the following applies: ~~additional guidance provided by Central Office FDOT.~~

- **In-situ soils are classified as Hydrologic Soil Group A, with high permeability, and**
- **Geotechnical investigation reveals there is no confining layer to impede drawdown, and**
- **Construction activities are limited within the treatment swale to avoid compaction and tracking of silt and muck.**

5.3.4.2 Detention and Retention Ponds

Add the following information to this section

6. Minimum Depth

Wet detention facilities shall have a minimum water depth of 6 ft (~~1.8 m~~) in order to minimize the growth of cattails, or other undesirable vegetation which increase maintenance costs. The 6 ft (~~1.8 m~~) depth will be measured between the pond bottom and the control or normal water elevation.

7. Skimmers/Baffles

All basin outlet structures shall be designed to skim floating debris, oil and grease. Skimmers/baffles shall be UV resistant fiberglass or galvanized steel, rather than aluminum, to minimize theft. Sufficient structural connection and support details shall be shown in the plans.

8. Sod

All side slopes shall be sodded. The side slopes of wet ponds shall be sodded to the normal water or control level, **whichever is lower**. The side slopes of dry facilities shall be sodded down to the toe of slope at the facility bottom. **The dry detention facility (orifice at pond bottom or lower) bottom shall be sodded.** The dry retention facility **(no orifice - treatment volume percolates through soil)** bottom shall be seeded and **raked**, or left bare.

9. Horizontal Clearance to Roadway

Pursuant to the Turnpike Canal Safety Study, horizontal clearance from the edge of travel lane to the edge of a water body/wet facility shall be greater than 75 feet. A water body/wet facility is defined as one which has a depth of water of 3 feet or more. Even for water bodies/wet facilities that are greater than 75 feet from the edge of a travel lane, protection may still be required. Refer to the TPPPH **Volume 1 Chapter 4** for Canal Protection Requirements.

Chapter 6 – Optional Culvert Materials

6.5 Culvert Material Types

Fiber reinforced concrete pipe and non-reinforced concrete pipe are not to be used on Turnpike facilities.

~~For Design-Build projects, the pipe material to be installed is to be shown in the final construction plans. An optional pipe material analysis must be performed to demonstrate that the design service life for that material meets the requirements of the FDOT Drainage Manual.~~ **[added to the 2014 FDOT Drainage Manual]**