TURNPIKE SUPPLEMENT

TO THE

FDOT DRAINAGE MANUAL

FLORIDA'S TURNPIKE ENTERPRISE

DRAINAGE DESIGN OFFICE

April 2019

INTRODUCTION

As part of the Turnpike's continuing quality enhancement effort, this ***Supplement to the Drainage Manual*** has been developed to provide consultants, reviewers, and management with a single source of additional Turnpike-specific requirements that modify or add to the requirements included in the ***Florida Department of Transportation (FDOT) Drainage Manual***.

The ***Supplement to the Drainage Manual*** is updated on an annual basis, following the official revision of the ***FDOT Drainage Manual***. Interim updates to the ***Supplement to the Drainage*** will be issued as Addenda to the annual revision.

Should you have any comments or suggestions for this document, please contact the Turnpike Drainage Design Engineer.

The following are changes, additions or deletions to the January 2019 FDOT Drainage Manual, Topic No. 625-040-002, for use on Turnpike projects only.

CHAPTER 1 - INTRODUCTION

1.4 GENERAL

Add the following

The intent of this supplement is to clarify and supplement criteria in the FDOT ***Drainage Manual***, in order to provide additional guidance to 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 lessons learned from past projects.

CHAPTER 2 – OPEN CHANNEL

2.4.4 Channel Bottom

Replace the second sentence of the 1st paragraph with the following

V-bottom ditches are not allowed on Turnpike-maintained facilities.

3.7.3 Shoulder Gutter

Replace the 2nd bullet with the following

On embankments, with slopes steeper than 1:6 for more than five feet vertically, to minimize erosion.

CHAPTER 3 – STORM DRAIN HYDROLOGY AND HYDRAULICS

3.9.1 Spread for Permanent Construction

Add the following

Bridge deck spread must be evaluated for all bridges including MOT phases. The Bridge Development Report (BDR) must include preliminary spread calculations for the bridge deck in order to determine whether additional drainage conveyance is required. Typical drainage conveyance costs may include, but are not limited to, additional shoulder width

during construction, bridge deck drains, and conveyance systems. Costs for the bridge deck drainage must be considered when comparing alternative bridge designs.

3.9.2 Spread for Temporary Construction

Add the following

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.

3.11 PIPES WITHIN OR ADJACENT TO RETAINED EARTH (WALLED) EMBANKMENT SECTIONS

Add the following sentence to the end of the 2nd paragraph

For Wall Zone Pipes, provide verification of wall zones in design calculations.

3.12.3 Resilient Connectors

Add the following to the end of the 1st paragraph

Resilient connectors are required for all vertical pipes.

CHAPTER 4 – CROSS DRAIN HYDRAULICS

4.8.1.1 Bridges

Add the following paragraphs to the section

ICPR Version 4 is the only acceptable version of ***ICPR*** for analyzing hydraulic performance of bridges over riverine waterways.

Table 4:3 Scour Estimates

Replace the second bullet under Table 4.3 with the following

For temporary bridges, a 25-year scour analysis is required. For temporary bridges in place longer than 85 months, apply the permanent scour frequency as per Table 4.3.

CHAPTER 5 – STORMWATER MANAGEMENT

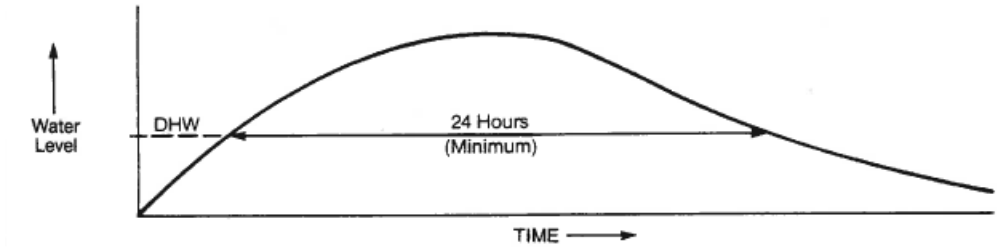
5.4.1.1 General

Add the following

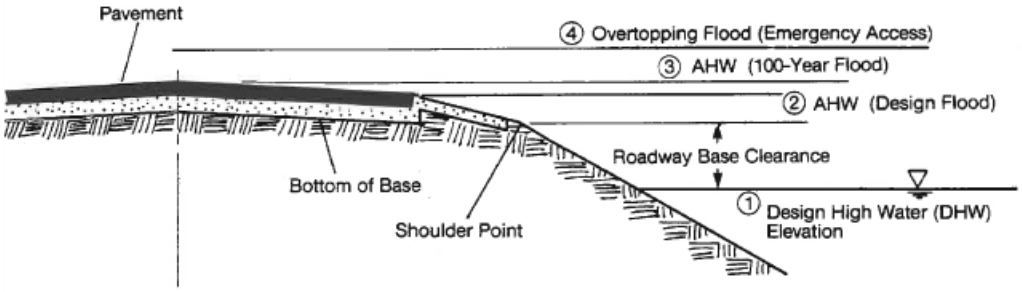
For treatment swales, base clearance to the base clearance water elevation (BCWE) shall be considered when establishing roadway grades. The BCWE for roadside treatment swales shall be set at the weir elevation. A lower elevation may be used if all of the following apply:

- 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 such as heavy equipment, staging, and desilting are limited within the treatment swale to avoid compaction and tracking of silt and muck.

For ponds, BCWE shall be set at the 24-hour design high water elevation (see figure below). In the absence of ponds and treatment swales, the BCWE shall be set at the Seasonal High Water Table elevation.



A) DHW Determination



Roadway Classification	Minimum Standard Roadway Base Clearance (feet)
Interstate	3
4-Lane (Primary Importance)	2-3
2-Lane (Primary Importance)	1-2
Other Facilities (Secondary Importance)	1
Standard values assume the base is susceptible to structural deterioration due to the proximity of standing water. Special conditions which require clearances below the minimum standard values can be addressed by using an asphalt or soil-cement base.	

WATER ELEVATION	PURPOSE	STANDARD CRITERIA
1) Design High Water (DHW)	Base Protection	Standing Water Duration Exceeds 24 Hours for Traditional Frequencies
2) Allowable High Water (AHW) for Design Flood	Culvert Capacity	At or Below Edge of Pavement for Design Frequency, T(See Chapter 8, Volume 2)
3) Allowable High Water (AHW) for 100-Year Flood *	Culvert Capacity	Two-Lanes--½ Lane Dry for Q_{100} Multi-Lane--½ Lane Dry for Q_{100}
4) Overtopping Flood	Emergency Access	Product of Velocity and Depth Less than 8 with a Maximum Depth of 1 Foot

*May not apply for all structures

B) Roadway Base Clearance and Various Water Elevations

5.4.4.2 Detention and Retention Ponds

Replace the 2nd sentence with the following

1. Maintenance Berm:

Provide at least 15 feet adjacent to the pond at a slope of 1:8 or flatter towards the pond.

Add the following item

8. 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.

Figure 5-1

Add the following note

4. Any borrow excavation occurring within the FDOT right of way shall meet the pond dimensional criteria depicted in Figure 5-1.