

## **TURNPIKE STORMWATER MANAGEMENT CONCEPTS REPORT**

The typical Turnpike scope requires submission of a Stormwater Management Concepts Report at the 15% phase of a project, if a pond siting report is not available and there is uncertainty as to whether stormwater management can occur within existing FDOT right of way. The purpose of the documentation is three-fold:

- 1) Identify potential stormwater management design alternatives for the overall project;
- 2) Determine design constraints that affect drainage and other design disciplines; and
- 3) Identify (obtain and review if feasible) specific data collection items needed to support the drainage design (i.e. adjacent permits, project permits, relevant studies, etc. - these items may not be available by the time the report is submitted).

The concepts report should identify the project's drainage constraints and possible fatal flaws; present the overall stormwater approach; discuss possible alternatives (briefly), and then present the potential concepts. The goal is agreement/concurrence between Turnpike and EOR on drainage concept/approach prior to plans development. It is desirable to establish the drainage concept early because right-of-way and permitting can impact the schedule. It is expected that the Stormwater Management Concepts Report would be developed without survey or significant roadway design, therefore only planning level effort should be performed and presented. Provide just enough detail to document approach. Details or cross sections need not be CADD drafted. Further, material developed for this document will be used as a basis for the Stormwater Management Alternatives Report prepared as part of the next step in the PD&E/Design process.

The type of information to present is specific to each project and the possible drainage approach. During creation of this report is the time to explore and discuss innovative ideas that may benefit the project. The format and Table of Contents for the Stormwater Management Concepts Report developed during PD&E will be expanded for use in the Stormwater Management Alternatives and Stormwater Management Design Reports.

### **STORMWATER MANAGEMENT ALTERNATIVES :**

There are several physical constraints that limit the use of certain types of stormwater management systems and these shall be evaluated during design. Existing right-of-way and surplus properties are good candidates for location of treatment systems and should be considered first. Include innovative opportunities such as regional facilities, golf course ponds, piped conveyance under treatment swales, and large pipes for attenuation. The FDOT Drainage Design Guide Chapter 9 discusses the general approach in selecting a pond site that can be used as a guide during this development process. Estimating

swale treatment opportunities should follow a similar methodology. Factors such as SHGWT, soil permeability, tail water, maintenance concerns and environmental issues should be discussed.

## **DESIGN CONSTRAINTS:**

The second purpose of the Stormwater Management Concepts Report is to establish the various design constraints that affect the project. Experience has taught us that (foreseeable) issues arise that change a component of the design and “if we would have known”, another approach may have been elected. Florida’s Turnpike Enterprise is requiring early coordination/identification of the design issues as a tangible way to become more efficient. These items could involve more than the drainage engineer and could address such issues as walls, bridges, and other constraints that could impact the design. The projects can benefit from identifying constraints and selecting the method to handle it. The following is an abbreviated list of design constraints and treatment parameters that may pertain to the project:

- *Floodplain encroachment and compensation requirements* – Preliminary estimate of potential encroachment and compensation ideas. This influences pond requirements and should be included with pond evaluation.
- *How to handle offsite area* – Will we have co-mingling or bypass? Will any existing drainage systems fail with propose conditions? Does the project eliminate any existing conveyance ditches?
- *Deficiencies in existing conditions* – Is there already a flooding problem? Does channel crossing have substandard clearances, scour or erosion problems? Does soils map indicate presence of unfavorable material?
- *Tail water constraints from receiving water body or storm sewer HGL* – Is the controlled or permitted water stage receiving water body verified? Are the plans to change stages in the future?
- *Estimated SHGWT* – Estimate the range of anticipated values and the methods proposed to establish water table. Relate any boring information to historical rainfall and SCS information. Discuss relationship to base clearance or pond recovery. Will the profile limit allowable stages in pond? Are any roadway profile changes required?
- *Drainage related design variations* – Cross slopes, side slopes, freeboard, canal hazard, etc.
- *R/W* – Evaluate potential for right-of-way, drainage or construction easements.
- *Criteria* – The exercise of reviewing all criteria may bring up questions to be discussed, i.e. safety factors, vertical clearance, and base clearance. Anticipate the most stringent criteria for design.
- *Utility conflicts* – Narrate what is known and unknown. Estimate how tight the constraint will be on drainage features such as outfall structures. Sketches and general solutions should be outlines.
- *Well fields can have significant effect on design* – Determine setbacks. Does their presence eliminate treatment alternatives?

- *Typical section options* – Side slopes guardrail, right-of-way berm details, maintenance area, cross slope to median or outside, canal hazards, and/or base clearance.
- *Roadside berms* – Is there a need to separate project runoff from adjacent canals? How does noise wall match up with berm configuration? How do outfall structure details or back slopes of the canals fit with berm configuration?
- *Retaining wall* – For locations where walls are an option to limit encroachment in ditches, design features like access and maintenance berms need to be considered
- *Wetlands and/or endangered/threatened species* – Approximate location, interface with drainage systems.
- *Water quality, Water Quantity & Special Basin Criteria* – for permitting and drainage requirements. Determine jurisdictional agency(s) responsible for permitting. What is the classification of the outfall water body? Is there additional treatment required for special or Outstanding Florida Waters? TMDL?
- *Sovereign submerged lands* – If this has the potential to create complications, we may want to initiate process early.
- *Outfall points* – Part of the stormwater management concept effort along with estimate of pond size and pond locations.
- *Utilities* – Identify major utilities within project and potential to impact design.

### **DATA COLLECTION ITEMS:**

The third step in this report is to identify site specific data needed to support the drainage design. Again, by identifying, early in the process, information required for the stormwater management design, the approach will be more timely and efficient. Items required at a minimum may include:

- Previous water management district permits;
- Previous drainage connection permits;
- Current flood studies and history of flooding;
- Previous design plans and drainage documentation;
- Existing Turnpike out-parcel maps;
- Previous or new geotechnical information;
- Previous or new survey data;
- Adjacent water control districts' seasonal high water table or control elevations;
- Tidal information;
- Well field maps; and
- And historical, archeological, and environmental information.

# **STORMWATER MANAGEMENT CONCEPTS REPORT (PD&E)**

## CHECKLIST

Purpose  
Project Description  
Existing Land Use  
Soils  
Design High Waters  
Floodplains & Floodways  
Cross Drains  
Permits/Special Basin Criteria  
Sovereign Submerged Lands  
Stormwater Management (Requirements/Options)  
Wetlands  
Tail water Constraints  
Offsite Areas/Co-mingling of Off-Site Drainage  
Utilities  
Hazardous Materials  
Other Constraints (Cemetery/Parks/Historic Buildings)  
Deficiencies of Existing Conditions  
Retaining Wall Requirements  
Outfall Requirements (R/W, Easements)