

# **STORMWATER MANAGEMENT DESIGN REPORT**

*(To be later inserted into the Drainage Design Documentation)*

**Note:** *This report outline is not all-inclusive. There may be situations when information not included in this outline should be included in the Stormwater Management Design Report to provide adequate explanations/documentation for project specific issues. The report is intended to be submitted at a 45% roadway phase so issues can be worked out prior to submittal of 60% roadway. Refer to TPPPH Volume 2 Chapter 2 Figure 2.1 for plans required at the 45% submittal phase.*

## **SECTION 1.0 – GENERAL INFORMATION**

### **1.1 Project Location.**

- ❑ Overall project location (county, city, section/township/range, Turnpike milepost, etc.)
- ❑ Datum used for this project. Provide datum conversion if applicable.

### **1.2 Purpose.**

- ❑ Brief description of the intent of the report.

### **1.3 Existing Drainage Patterns.**

- ❑ General drainage patterns in the vicinity of the project, on a regional basis.
- ❑ Address offsite areas draining toward the Turnpike right-of-way.
- ❑ Review KMZ file containing Drainage Connection Permits for projects that discharge to the project's right-of-way.
- ❑ Describe if project is in open and/or closed basins.
- ❑ Brief description of receiving water bodies and their classification (Outstanding Florida Water, etc).
- ❑ Brief description of proximity to potable well fields and well field protection zones.

### **1.4 Tailwater.**

- ❑ Discuss tail water elevations used in the design for all cases such as ponds, storm sewers, ditches, underdrain, etc. Include pertinent information such as, previous studies from state or local agencies, etc. References should be made to the appropriate Appendix and/or Document for calculations and information related to tail water determinations.

### **1.5 Floodplain Impacts and Mitigation**

- ❑ Describe if the project impacts adjacent floodplain areas. If so, describe how it is being mitigated.
- ❑ Describe whether or not the project will have any floodway involvement.

### **1.6 Rules & Regulations/Regulatory Agency Coordination**

- ❑ Describe all permits (state, local, etc.) needed to construct this project.
- ❑ Describe water quality and quantity criteria applicable to this project.
- ❑ Describe all stormwater recovery requirements applicable to this project.
- ❑ Summarize drainage criteria specific to this project.
- ❑ Describe any Special Basin Criteria that may apply to the project.
- ❑ Describe whether the project discharges to an impaired water body and what TMDL's are associated with it.

All maps and figures should be included in Appendix A. These include the Project Location Maps, USGS Quadrangle Maps, Soils Maps, FEMA Maps, WMD Basin Maps, and Wellfield Protection Zone Maps.

## **SECTION 2.0 – PRE-DEVELOPMENT ANALYSIS**

*The intent of Section 2.0 is to provide a brief narrative describing the existing condition of the project site as it relates to stormwater management. The narrative should include information on the number of drainage basins with their respective outfalls, as well as the type of existing stormwater management systems currently in use. Tables summarizing pre-development analysis should be included in Section 2.0. All supporting calculations, documentation, and the pre-development drainage map, for the pre-development analysis, should be presented in Appendix B. Refer to the FDOT Drainage Manual and the FDOT Drainage Design Guides Chapter 9 for guidance.*

**For each basin include the following:**

- Basin name.
- Begin and end station limits.
- Existing drainage patterns (i.e., flow paths and time of concentration).
- Land uses (i.e., curve numbers).
- Describe soils and hydrologic grouping.
- Ultimate outfall location for discharge comparison (open or closed basin?).
- Document/justify tail water (provide source of information).
- Identify hazardous materials, utilities, archeological, historical, and environmental information affecting the design of the stormwater facility.
- Identify offsite areas draining towards the road and how offsite runoff is currently conveyed through the project.
- Previously permitted information.
- Previously permitted/required water quality, if applicable (is there surplus?).
- Existing permitted stormwater management system, if applicable.

## **SECTION 3.0 – POST-DEVELOPMENT ANALYSIS**

*The intent of Section 3.0 is to provide a brief narrative describing the proposed condition of the project site as it relates to stormwater management. The narrative should include information on the number of drainage basins with their respective outfalls, as well as the type of recommended stormwater management systems to be used for the basin. Tables summarizing post-development analysis should be included in Section 3.0. Discharge rates may be compared at the ultimate outfall locations if more than one basin shares the same downstream outfall. All supporting calculations and documentation, including the post-development drainage map, for the post-development analysis should be presented in Appendix C. Refer to FDOT Drainage Manual and Drainage Design Guide Chapter 9 for guidance.*

**For each basin include the following:**

- Basin name.
- Begin and end station limits.
- Proposed drainage patterns (flow paths in ditches and swales for example, time of concentration, etc.).
- Land uses (i.e., curve numbers).

- ❑ *Discuss direct discharge to Outstanding Florida Waters, TMDLs or facilities within a Wellfield Protection Zones, if any.*
- ❑ *Describe soils and summarize results from the geotechnical investigation.*
- ❑ *Ultimate outfall point.*
- ❑ *Discuss any Special Basin Criteria that may apply to the particular project basin.*
- ❑ *Document/justify tail water, seasonal high water table, control, and weir elevations.*
- ❑ *Identify offsite areas draining towards the road and describe how it is to be conveyed through the project.*
- ❑ *Recommended stormwater management system.*
- ❑ *Total required and provided water quality (includes previously permitted, if applicable, as well as anything new) meet criteria.*
- ❑ *Treatment volume recovery meets criteria.*
- ❑ *Permanent pool volume meets criteria, if applicable.*
- ❑ *If compensating or over treatment to be used, provide detailed description of area of new impervious not being treated, area of existing pavement to be treated, etc.*
- ❑ *Retention systems certified by a Geotechnical Engineer.*
- ❑ *Post-development discharge rates compared to the pre-development discharge rates (meets critical duration criteria, as stated in Chapter 14-86, F.A.C.).*
- ❑ *Post-development stages provide for freeboard as stated in the FDOT Drainage Manual.*

## **SECTION 4.0 – FLOODPLAIN ANALYSIS**

*The intent of Section 4.0 is to provide a brief narrative describing the floodplain conditions at the project site and should include the following information. Tables summarizing floodplain impacts, locations, and compensation should be included in Section 4.0. All supporting calculations and documentation for the floodplain analysis should be presented in Appendix D.*

- ❑ *Brief narrative.*
- ❑ *Statement describing impacts have been avoided or minimized.*
- ❑ *Describe limits of impacts and final cut/fill quantities, if applicable.*
- ❑ *Describe where compensation is to occur, if applicable.*

## **SECTION 5.0 – BASE CLEARANCE ANALYSIS**

*The intent of Section 5.0 is to provide a brief narrative describing site specific base clearance issues as well as issues involved in determining the base clearance water elevation. Tables summarizing the calculated base clearances should be included in Section 5.0. All supporting calculations and documentation for the base clearance analysis should be presented in Appendix E.*

- ❑ *Describe how the base clearance water elevation was established.*
- ❑ *Describe limits of project which do not meet Florida Department of Transportation Plans Preparation Manual base clearance requirements.*
- ❑ *Describe how sections that do not meet base clearance are to be handled.*

## **SECTION 6.0 – REFERENCES**

### **APPENDICES**

#### ***Appendix A – Figures***

- Project Location Maps*
- USGS Quadrangle Maps*
- Soils Maps*
- FEMA Floodplain Maps*
- WMD Basin Maps*
- Wellfield Protection Zone Maps*
- Other*

#### ***Appendix B – Pre-Development Calculations and Documentation including:***

- Pre-development drainage map with aerial background*
- Supporting pre-development stormwater facility calculations*
- Pre-development ICPR Input and Output Data*
- Pre-development nodal diagram. Reference specific structure numbers and pond names as shown in the construction plans.*

#### ***Appendix C – Post-Development Calculations and Documentation including:***

- Post-development drainage map with aerial background*
- Supporting post-development stormwater facility calculations*
- Post-development ICPR Input and Output Data*
- Post-development nodal diagram. Reference specific structure numbers and pond names as shown in the construction plans.*
- Post-development recovery analysis*

#### ***Appendix D – Floodplain Encroachment/Compensation Calculations and Documentation***

#### ***Appendix E – Base Clearance Calculations and Documentation***

#### ***Appendix F – Correspondence and Excerpts from Previous Permits and Studies***

## **STORMWATER MANAGEMENT DESIGN REPORT**

### **CHECKLIST**

- Purpose*
- Project Description*
- Existing Land Use*
- Soils*
- Seasonal High Water Elevations/Base Clearance Water Elevations*
- Floodplains & Floodways*
- Permits/Special Basin Criteria*
- Sovereign Submerged Lands*
- Stormwater Management (Requirements)*
- Wetlands*
- Tailwater 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 (right-of-way, easements)*
- Freeboard in ponds meets criteria*
- Post-condition discharges do not exceed pre-condition discharges*
- Provided treatment volume equal to or greater than pre-condition treatment volumes*
- Treatment volume recovery time meets criteria*
- Pond dimensions meet criteria*
- Construction plan details match drainage design*

### **EXHIBITS CHECKLIST**

1.  *Location Map*
2.  *Quadrangle Maps*
3.  *Soils Maps*
4.  *FEMA Maps*
5.  *WMD Basin Maps*
6.  *Wellfield Protection Zone Maps*
7.  *Pre- and Post- Drainage Maps*
8.  *Stormwater Criteria*
9.  *Stormwater Details/Calculations*