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General Consultant
Florida's Turnpike Enterprise
Florida Department of Transportation



TRANSMITTAL

TO: Mike Davis and Tom Pridgen

RE: Updates for Website

FROM: John Morrison

DATE: September 16, 2003

I am sending you ☒ Attached
☐ Under Separate Cover

the following item(s) for review and concurrence:

| COPIES | DATE | No. of Sheets | DESCRIPTION |
|--------|------|---------------|--|
| 1 | | | Draft Location Hydraulics Memorandum And Turnpike Stormwater Management Alternatives Formats |

REMARKS: The documents listed above are draft formats to be used by the Consultant for PD&E/Design projects which are not specifically addressed in the PPM or Chap. 24 of the PD&E Manual. The attached is the final version that I recommend be added to the Turnpike's Bulletin Website.

Concurrence: Michael J. Davis
Michael Davis, P.E., Program Manager

9/23/03
Date

Concurrence: Thomas Pridgen
Thomas Pridgen, P.E., Assistant Turnpike Design Engineer

9/30/03
Date

DRAFT LOCATION HYDRAULICS MEMORANDUM (EDIT FOR SPECIFIC PROJECT)

I. PURPOSE

The purpose of the memorandum is to address base floodplain encroachments resulting from the roadway improvements evaluated in the Project Development and Environment study. In accordance with Executive Order 11988m “Floodplain Management”, USDOT Order 5650.2, “Floodplain Management Protection”, and Federal-Aid Policy Guide 23 CFR 650A, floodplains must be protected. The intent of these regulations is to avoid or minimize highway encroachments within the 100-year (base) floodplains, and to avoid supporting land use development, which is incompatible with floodplain values.

II. BASE FLOODPLAIN

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for _____, community panel number _____, indicates the entire project area is **(not)** located in the 100-year floodplain (see **Figure** _____). In addition, there are **(no)** regulated floodway(s) within the project limits. Therefore, there will be **(no)** floodplain involvement with federally defined floodplains.

However, at the local level, the project area has a defined floodplain established by the _____ Water Management District (____ WMD). No adverse impacts are anticipated to the floodplain, as required by the _____ WMD permitting process. The _____ WMD requires replacement of floodplain storage lost as a result of encroachments. In addition, the _____ WMD and FDOT design criteria for conveyance systems (e.g. culverts) allows no significant increase in flood stages.

III. WATER QUALITY

This project will have no adverse impact to the area’s water quality. Stormwater treatment of the additional impervious areas will be treated as required by the _____ WMD Environmental Resource Permit (ERP).

IV. RISK ASSESSMENT

There is no change in flood “Risk” or floodplain impacts associated with this project.

The following floodplain statement is a slightly modified version of statement Number _____ in the FDOT PD&E Manual, tailored for this project:

(See Chapter 24, Appendix A, PD&E Manual)

TURNPIKE STORMWATER MANAGEMENT ALTERNATIVES REPORT

The typical Turnpike scope requires submission of a Stormwater Management Alternatives Report near the 15% phase of a project. The purpose of the documentation is three-fold:

- 1) Identify potential stormwater management design alternatives;
- 2) Address 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 report should identify the projects' drainage constraints and possible fatal flaws; present stormwater approach; discussion of possible alternatives (briefly), and then present the preferred concept. 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 the Stormwater Management Alternatives Report would be developed without survey or significant roadway design, therefore only planning level (preliminary estimate) calculations should be performed and presented. Provide enough calculations and sketches to document approach. Details or cross section need not be CADD drafted. Further, material developed for the document will be used as a basis for the Alternative Stormwater Management Concepts Memorandum prepared for a 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. This format and Table of Contents for the Alternative Stormwater Management Concepts Report developed during PD&E will be used for the Stormwater Management Alternatives and Stormwater Design Reports.

STORMWATER MANAGEMENT ALTERNATIVES :

All types of stormwater management systems could be used based on physical constraints of the project. Wet detention, retention, dry detention, on-line, off-line, joint use, exfiltration, and even wetland treatment. Existing right-of-way and surplus properties are good candidates for location of treatment systems. Include innovative opportunities, e.g., regional facilities, golf course ponds, piped conveyance under treatment swales. The Stormwater Management Facilities Handbook 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, tailwater, maintenance concerns and environmental issues should be considered.

As existing facilities are being expanded there is more of an effort to develop schemes that provide for an overall approach to meeting the permit regulations. Stormwater treatment attenuation and compensation are valuable methods and management techniques that should be considered. The project should be separated into sub-basins with estimates of water quality requirements for new pavement, previous permit obligations, and existing areas for potential compensation. Stormwater attenuation requirements should be based on a project wide or by major basin divides and should be based on estimates of Tc, curve numbers, regulatory design storms, etc. The ability for Turnpike to take advantage of compensation adds another layer of options. Compensation scenarios should be “story booked”. Starting at areas where compensatory treatment is favorable, determine how much can the first option provide. Proceed to next favorable compensation option until project requirements are exceeded. Treatment alternative (compensation and especially right-of-way for ponds) need to include a second or third choice. Very brief narrative of pros and cons of viable options and marked areas on aerial maps should suffice in presenting recommended options.

DESIGN CONSTRAINTS:

The second purpose of the Drainage Concept 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. The 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:

- *Flood plan 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? 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?
- *Tailwater constraints from receiving water body or stormsewer 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* (Significant to design, no reason to copy from manuals) – 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 criteria match up with berm configuration? How does 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* – 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.
- *Sovereign submerged lands* – If this has the potential to create problems, we may want to initiate process early (this is an issue but more of an environmental issue).
- *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.

ALTERNATIVE STORMWATER MANAGEMENT CONCEPTS MEMORANDUM (PD&E) AND STORMWATER MANAGEMENT ALTERNATIVES AND STORMWATER MANAGEMENT DESIGN REPORT

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)
Pavement Drainage
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 (R/W, Easements)

EXHIBITS

1. Location Map
2. Drainage Map
3. Soils Map
4. FEMA Map
5. WMD Basin Map
6. Stormwater Criteria
7. Stormwater Details/Calculations
8. Cross Drain Details/Calculations
9. Pavement Drainage Calculations
10. Ditch Calculations

NOTE: Each document will develop the items listed in the table of contents to an appropriate level of detail.