

Chapter 16

Design Submittals

The following are changes, additions or deletions to the January 2014, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

16.2 Design Documentation Submittals

16.2.3 Typical Section Package

Add item e. to Bullet #1 “Shall be required if:”

- e. There are realigned local roads, frontage roads, cul-de-sacs, railroads, canals, aerial transmission lines, etc. as applicable.

Add the following after paragraph 3

When cross roads or other facilities are maintained by another agency, they should sign and date their approval on the typical itself before Turnpike concurrence. If this is not possible, a letter will be written to the agency confirming their concurrence and requesting a concurrence signature. In that case, the design documentation will include a copy of the local agency standard to document design conformance. (The maintaining agency does not need to upgrade their typicals to meet higher FDOT or Turnpike criteria.)

Add to list for “Proposed Roadway Typical Section Drawing”

- 17. Future lane widths (types and locations).
- 18. Clear zone.
- 19. Vertical and Horizontal Clearances at crossing roads if project includes work within bridge limits.
- 20. When shoulder widths are wider than standard widths (e.g. to mitigate/accommodate SSD or high truck traffic), provide a note on each typical section drawing to explain the reason for the additional shoulder width.
- 21. Denote elements that require a design exception/variation.

If major changes will be made after initial construction, a separate future typical should be prepared. Future lanes on proposed crossroad typicals should be dashed and labeled "Future, By Others". Future typicals may be urban while proposed or may be rural with different design speeds. (See TPPPH Chapter 2 on future lanes and Profile Grade Lines, PGLs.)

Add to list for “Proposed Structure Typical Section Drawing”

- 13. Minimum vertical clearance.

14. When shoulder widths are wider than standard widths (e.g. to mitigate/accommodate SSD or high truck traffic), provide a note on each typical section drawing to explain the reason for the additional shoulder width.
15. Denote elements that require a design exception/variation.

Add the following section

16.2.3.1 FTE Processing

If major changes will be made after initial construction, a separate future typical should be prepared. Future lanes on proposed crossroad typicals should be dashed and labeled "Future, By Others". Future typicals may be urban while proposed or may be rural with different design speeds. (See TPPPH Chapter 2 on future lanes and Profile Grade Lines, PGLs.)

The draft Typical Section Package will be submitted to the Turnpike Project Manager for review through the ERC process. Upon acceptance by FTE staff, the Turnpike Roadway Engineer (TRE) will advise the Project Manager to instruct the Consultant to submit the signed and sealed Typical Section Package to the TRE who will forward the typical section package to the Turnpike Design Engineer (TDE) with a recommendation of approval. After receiving concurrence by the TDE, a signed copy will be returned to the Consultant.

16.2.4 Preliminary Drainage Design

Add the following paragraph

Complex projects require a preliminary 45% drainage submittal. The intention of this submittal is to verify the design methodology adequately documents compliance with FDOT, Turnpike, and Regulatory Stormwater Management Criteria.

16.2.5 Preliminary Geometry and Grades

Add the following section

16.2.5.1 Turnpike Preliminary Line and Grade Submittal

The Design Consultant shall submit preliminary (approximately 15 percent) alignment and grade sketches/computer plots depicting the proposed geometric design. The submittal shall include horizontal geometry for all mainline roadways, ramps, cross streets and side roads. As a minimum, vertical geometry shall be provided for all mainline roadways and cross streets. Vertical geometry for ramps and side roads will be provided where critical to the project. The sketches or computer plots can be in sheet or roll form and will be at a reasonable and useable scale. Base clearance water, seasonal high groundwater, and flood plain elevations shall be shown in profile view.

Supporting calculations/computer printouts shall also be submitted. Specific elements which should be addressed in the supporting documentation include but are not limited to design speed, lane widths, shoulder widths, bridge widths, horizontal and vertical clearances, stopping sight distance, intersection sight distance, aesthetics, access management and base clearance. The

various elements should be developed to a level of detail consistent with the objectives of the preliminary (15 percent) submittal as described below. Continued development and refinement of the geometric elements for subsequent Phase submittals is anticipated.

The primary objectives of the Preliminary (15 percent) Geometric Submittal are to:

1. Check consistency with the intent and scope of the Project Concept Report.
2. Evaluate the impacts of changes to the Project Concept, resulting from the normal design development process as well as those due to changes in scope, identification of adverse site conditions, etc.
3. Verify the geometric viability of the project for the desired design speed and traffic volumes.
4. Provide a basis for early coordination with other disciplines (drainage, structures, etc.) and for early identification of design constraints or problems.
5. Document off-site and pavement drainage constraints; such as flood plain elevations and base clearance/seasonal high water table.
6. Design criteria specific to the project.
7. Anticipated variations and exceptions that are associated with horizontal and vertical alignment.

16.2.6 Preliminary Traffic Control Plan

Add the following section

16.2.6.1 Turnpike Preliminary Traffic Control Plan

The Turnpike is a unique facility in that there are variable site conditions and traffic volumes requiring a detailed analysis to determine the appropriate Traffic Control Plan (TCP). The Turnpike has heavy holiday and seasonal traffic flows that will impact the solution based on the time of year, location of the project to tourist destinations and other varying conditions. Traffic Control impacts to the traveling public on an FTE facility can severely limit or prohibit construction operations using lane closures. Due to these impacts, a preliminary TCP design (45 percent) should be submitted for review. A comment resolution meeting between the design consultant and FTE production and Construction staff should be scheduled following the review. This submittal will be required, but not limited, to the following items:

1. Traffic Pacing.
2. Traffic Detours, including lengths and impacts on toll revenue.
3. Traffic Crossovers.

4. Paving approach and sequence, including proposed cross slope correction.
5. Lane Closure Analysis and restrictions, and daytime/weekend consideration.

The preliminary submittal should be on Roll Plots, in electronic format, and should include, but not limited to:

1. Documentation of off-site and pavement drainage constraints.
2. Critical Cross Sections at temporary traffic shifts.
3. Typical Sections for each proposed phase.
4. Traffic Pacing and Detour analysis as appropriate for the project.

It is recommended that coordination occur with FTE Consultants for an appropriate speed to use in the pacing analysis.

16.2.7 Pavement Selection and Design

Add the following section

16.2.7.1 Turnpike Pavement Design Submittals

Pavement designs on Florida's Turnpike System shall be done to the following minimum standards, variations from these standards require concurrence by Turnpike Roadway Engineer prior to submittal of the final pavement design for concurrence by the TDE.

1. All pavement designs on new construction shall be calculated using a minimum reliability (%R) of 95 percent.
2. All pavement designs on rehabilitation projects shall be calculated using a minimum Reliability (%R) of 99 percent.
3. All temporary pavement designs for use during construction shall be calculated using a minimum Reliability (%R) of 80 percent.
4. All pavement designs, with the exception of temporary pavement, shall be calculated for a 20 year design life. The minimum design life and traffic ($ESAL_d$) for temporary pavements shall be no less than the construction period for the project.
5. Table 5.5 of the Flexible Pavement Design Manual shall be the required minimum thickness for new construction and resurfacing projects, as well as, for temporary pavements during construction.
6. All travel lanes pavement shall include PG 76-22 (PMA) in the top structural lift and friction course regardless of traffic level.

7. The designer shall coordinate the use of FC 12.5 or FC 9.5 with FTE Production, Construction and Material departments at any ramp crossroad terminus that shows extensive failure of the existing Friction Course. Department approval shall be obtained prior to submitting signed and sealed pavement designs.
8. Using a much higher traffic level mix than traffic requires can cause premature deterioration and cracking of the pavement. Therefore, the designer should not increase the traffic level mix in the pavement design documents or plans to anticipate optimization of contractor operations. The FDOT specifications 334-1.2 provides the Contractor this flexibility within the realms of required criteria.
- 8.9. Whenever new pavement is proposed to be joined to existing pavement such as widening, auxiliary lanes, ramps, turn lanes, etc., a minimum 6" wide shelf will be created at the longitudinal joint by milling the existing pavement structure. The minimum depth of the milling will equal the thickness of the final lift of structural course in the new pavement structure. This will create a milled offset in the longitudinal pavement joint from preceding lifts of structural asphalt. Tack coat is to be used in the shelf aid in adhesion and imperviousness. A detail of the longitudinal joint will be developed and placed in the project Typical Section details. The Traffic Control Plan will accommodate the space necessary for this work in the phasing sequence. Plan notes or a table of dimensions will describe the limits of the milled shelf width with width and depth.

Pavement Design Reports shall be submitted to the Turnpike Project Manager for review in electronic format through the ERC submittal process. Upon acceptance by FTE staff, submit the signed and sealed Pavement Design Reports. The TRE will forward the report to the TDE for concurrence and signature. A signed copy will be returned to the consultant.

A sample Table of Contents for the Pavement Design Report and also the Pavement Coring and Evaluations Report are available at the following link:

http://design.floridasturnpike.com/prod_design/roadway/resourcesandchecklist.html

Add the following section

16.2.7.2 Cross Slope Analysis Report – Design

Existing cross-slopes shall be analyzed and a separate cross slope analysis report should be submitted concurrently with the project pavement design prior to the Phase II project submittal. The cross slope analysis report shall be submitted to the Turnpike Project Manager for review in electronic format through the ERC submittal process. A sample Table of Contents for the cross slope analysis report is available at the following link:

http://design.floridasturnpike.com/prod_design/roadway/resourcesandchecklist.html

Section 25.4.6 of PPM Volume 1 requires tabulating existing cross slopes in the plans at 100 feet intervals, and preparing cross sections for the plans 50 feet before and after PC's and PT's and at 300 feet intervals along curves, for superelevation correction.

FTE experience is that simplifying the cross slope correction design and providing greater plan clarity is necessary to accomplish cross slope correction in the field. Typically, profilograph data is collected and significant coordination occurs as to the best paving approach and how it should be shown in the plans, with a preference to show milling at specific cross slopes between stations and from single control points, followed by constant depth resurfacing. This approach minimizes the amount of the data shown in tabular format.

Therefore, the new PPM requirements for cross slope correction design and plan presentation, as described above should be evaluated on a project by project basis and waived unless deemed beneficial.

Add the following section

16.2.7.3 Cross Slope Analysis Report – Post Design

When a project includes cross slope correction, verification of the newly constructed corrected cross slopes is required. Typically, profilograph data will be collected and provided to the EOR for analysis. The EOR will submit a design memorandum to the Turnpike Roadway Engineer indicating if the newly constructed cross slope correction meets the requirements detailed in the plans and in PPM Chapter 25.4.6 and 25.4.7.

Add the following section

16.2.9 Roadway Design Documentation

Roadway design documentation shall be provided at Phase I, II, III and IV plans submittals. The design documentation shall include, but is not limited, to the following information as applicable:

- I. Section 1**
 - A. Narrative
 - a. Summary of existing and proposed design
- II. Section 2 – Design Documentation**
 - A. Location Map
 - B. Roadway Design Criteria (Table Format)
 - C. Horizontal and Vertical Alignments (GEOPAK Output)
 - D. Design Calculations
 - a. Superelevation
 - b. Horizontal and Vertical Stopping Sight Distance
 - c. Vertical Clearance
 - d. Barrier – Length of Need
 - E. Typical Section Package (Final Signed and Sealed)

- F. Pavement Design Report (Final Signed and Sealed)
- G. MOT
 - a. Lane Closure Analysis (Final Signed and Sealed)
 - b. Pacing Analysis
 - c. Detour Analysis
 - d. Impact to Toll Facilities
- H. Existing Roadway Conditions Assessment Report (ERCAR)
- I. Meeting Minutes/Project Correspondence (Related to Roadway Elements)
- J. Comments and Responses (Related to Roadway Elements)

The design documentation shall include all design notes, data, and calculations to document the design conclusions reached during the development of the contract plans. The design notes, data, and computations shall be recorded on size 8 ½" x 11" sheets, fully titled, numbered, dated, indexed and signed by the designer and the checker. Computer output forms and other oversized sheets are allowed. All documentation shall be submitted electronically to the FTE Project Manager.