

**TURNPIKE PLANS PREPARATION AND  
PRACTICES HANDBOOK (TPPPH)**

**VOLUME 1**



**FLORIDA'S TURNPIKE ENTERPRISE  
PRODUCTION DESIGN DEPARTMENT**

**OCOEE, FL**

**March 2017**

## **Introduction**

As part of the Turnpike's continuing quality enhancement effort, the Turnpike Plans Preparation and Practices Handbook (TPPPH) that includes Volumes 1, 2, and the Turnpike Enterprise Guide Drawings, has been developed to provide Consultants, Reviewers and Management with a single source of additional Turnpike specific requirements that modify or add to the normal requirements included in the FDOT Plans Preparations Manual (PPM). These two sources include the normal criteria that govern our work and help our projects to better "conform to requirements", the official FDOT definition of quality.

For Turnpike requirements related to tolling, please see the General Toll Requirements (GTR) which is a separate document.

The TPPPH Table of Contents for Volumes 1 and 2 show the PPM's Chapters and Sections that have been modified. If a section has been modified, the user can refer to the specific section in the TPPPH shown in the Table of Contents.

The TPPPH is updated on an annual basis (following the revisions to the PPM). We hope that you will find this document helps with the efficient production of quality plans.

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

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*No changes to the entire chapter*

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*No changes to the entire chapter*

# Chapter 1

## Design Controls

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

### 1.5 RRR Design

*Add the following section*

#### 1.5.1 Turnpike Resurfacing, Restoration and Rehabilitation (RRR) Design

Florida's Turnpike Enterprise resurfacing design criteria must follow the modifications shown in Chapter 25 of the TPPPH.

### 1.9 Design Speed

#### 1.9.1 Design Speed Coordination and Approvals

*Add the following paragraph*

All Turnpike Interstate Facilities will follow Table 1.9.2 (70 MPH minimum design speed) with the following exceptions.

1. HEFT from Milepost 0 to Milepost 27.5 is classified as an Urbanized Freeway and will have a design speed of 65 MPH in accordance to AASHTO design criteria, for horizontal and vertical curve length and stopping sight distance, with the exception of K-Values for crest vertical curves that must meet or exceed the more stringent FDOT 60 MPH criteria. All other design elements must conform to FDOT criteria.
2. Veteran's Expressway from Milepost 1.54 to Milepost 13.57 will have a design speed of 60 MPH.
3. Polk Parkway from Milepost 0 to Milepost 12.7 will have a design speed of 65 MPH.

*Add the following section*

## **1.13 Turnpike Design Controls**

### **1.13.1 Use of "Interstate" vs. "Freeway Other" vs. "Non Interstate" Criteria**

Unless approved by the Turnpike Design Engineer, the Turnpike System must be designed to "Interstate" Standards with the following exceptions.

1. Veteran's Expressway from Milepost 1.54 to Milepost 13.57 is classified as an Urbanized Freeway.

## Chapter 2

### Design Geometrics and Criteria

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

#### 2.0 General

*Add the following paragraph*

The width of all bridges must equal the paved width of the approach roadway including the paved width of shoulders. Section 2.3 of this Volume provides criteria for design of shoulders.

#### 2.1 Lanes

##### 2.1.5 Cross Slopes

*Add the following paragraph*

Median through-lane widening, turn lanes, tapered or parallel single lane ramps adjacent to two through-lanes do not automatically warrant a 3 percent cross slope. Surface drainage will be reviewed and used as the deciding factor. New two lane ramps, however, will be designed with 3 percent for both lanes through the gore area. It is understood that Figure 2.1.1 depicts through lanes, and that auxiliary lanes can be applied with a cross slope in the same direction as the adjacent through lane even if this causes more than three lanes to be sloped in the same direction. This approach does not require a Design Variation, but must meet lane spread requirements for storm water runoff. However, a hydroplaning analysis will be required if number of lanes sloped in one direction is greater than the maximum allowed of 3 lanes.

##### 2.1.5.1 Hydroplaning Risk Analysis

*Add the following paragraph*

A hydroplaning analysis is required whenever any additional contributing pavement (ex: Express Lane buffer, paved shoulder, paved gore, auxiliary lane, etc.) is added to the Standard Pavement Cross Slope sections shown in Figure 2.1.1. Super-elevated sections will be analyzed for hydroplaning when two (2) or more crashes occurred during the last 5 year period that were within the curve including crashes that were attributable or associated with weather/roadway conditions. For bridges with un-grooved decks that exceed the Standard Pavement Cross Slope sections shown in Figure 2.1.1, a hydroplaning analysis is required. Hydroplaning analyses will apply to all conventional and non-conventional projects; (widening, reconstruction, resurfacing, and new construction projects).

## 2.1.6 Roadway Pavement

*Add the following paragraph*

TPPPH Section 16.2.7.1 contains the minimum standards for pavement designs on the Turnpike System.

## 2.1.7 Transitions of Pavement Widths

*Add the following paragraph*

At bridge approach slabs, for a 150 foot length before or after the concrete approach slab, the ultimate pavement design asphalt thickness must be placed flush with the concrete at the ultimate profile grade. The initial pavement section must transition to the ultimate thickness at a maximum rate of 0.08 percent (1 inch/100 feet).

## 2.3 Shoulders

*Add the following paragraphs*

On ramps, the left and right shoulder widths may be reversed or adjusted if needed to provide additional sight distance on the inside of a curve. However, the sum of the right and left shoulder widths must be greater than or equal to the sum of the standard shoulder widths and in no instance will the shoulder width on the outside of the curve be less than 4 ft. Even though this is an acceptable practice for mitigating sight distance per AASHTO Chapter 10.9.6, a Design Variation for shoulder width will be required.

Where single lane ramps meet cross roads, additional ramp lanes are usually added for acceleration/deceleration of right or left turns. Unless these additional lanes are more than 500 feet long measured along the ramp baseline, single lane six foot wide ramp shoulders must be used throughout. A similar 500 feet length would apply to ramp plaza approaches and departures. Frequent short changes in ramp width do not warrant corresponding short changes in ramp shoulder width. The shoulder transitions may be longer than the multi-lane ramp segment.

Other shoulder requirements:

1. Four feet paved inside shoulders on one lane ramps and profiled edge lines on both sides of the travel way for all ramps must be evaluated at each ramp location within a project before implementation. The evaluation must consider horizontal and vertical geometry, sight distance, crash data, and other site specific factors to compare safety benefits to constructability and cost considerations.
2. "Two Lane Ramp Interstate" within PPM Table 2.3.1 must also be applied to ramps with more than two lanes, and thus have a four feet paved inside shoulder and a ten feet paved outside shoulder.
3. Though PPM Figure 2.11.1 only shows "two lanes" for multi-lane ramps, the shoulder configuration (six feet inside shoulder and ten feet outside shoulder) must also be applied when more than two ramp lanes occur.
4. Twelve feet inside and outside paved shoulders must be provided for mainline sections that are three lanes or more in one direction, and that have greater than 250 DDHV trucks.

Additional stabilization and continuation of the shoulder cross slope beyond the twelve feet paved width are not required. This shoulder width requirement also needs to be applied to bridges when the above conditions occur.

5. A minimum median paved shoulder width of twelve feet is required for express lane marker separated Express Lanes.
6. Shoulder requirements for 100 ft. of pavement centered on the toll gantry, are listed in the General Tolling Requirements.

Deviations to the above requirements will require an approved technical memorandum, similar in effort to preparing and processing a standard Design Variation.

At tolling locations, the paved shoulder width must meet the total minimum roadway shoulder widths (paved & unpaved) as specified in the FDOT PPM and the Turnpike TPPPH.

### **2.3.1 Limits of Friction Course on Paved Shoulders**

*Add the following paragraph*

Shoulder pavement on the high side where the shoulder slopes toward the travel lanes, the shoulder pavement will be flush with the adjacent travel way friction course to avoid trapping water on the shoulder. Inside Shoulder Detail Guide Drawings can be found at the following link:

<http://floridasturnpike.com/design/tppph.html>

### **2.3.2 Shoulder Warning Devices (Rumble Strips)**

*Add the following paragraph*

The minimum thickness of structural asphalt on shoulders where ground-in rumbles strips are to be used is 1.5 inches. On existing shoulders without rumble strips that call for new rumble strips to be placed, the minimum thickness of existing structural asphalt and proposed asphalt must be no less than 1.5 inches.

*Add the following section*

### **2.3.4 Shoulder Rocking**

Cross slope for full width shoulders in a tangent section may be varied from 3% to a maximum of 6%. In areas where a minimal longitudinal gutter grade of 0.3% cannot be met, a minimum longitudinal gutter grade of 0.24% must be provided. If the minimum 0.24% cannot be provided, shoulder rocking is allowed to maintain a minimum longitudinal gutter grade of 0.24%. The minimum distance between the low point and high point is 100 feet. Design must include provisions to assure that the reveal of the concrete barrier is not compromised.

For the outside shoulder, the Turnpike will allow one of three types of treatment in areas where the outside shoulder slope must be varied in order to meet minimum spread criteria. Options 1 and 2 must be shown as not feasible or workable before Option 3 can be considered.

1. Use concrete barrier wall with inlets. If the shoulder slope must be varied then the above criteria for varying the shoulder slope and longitudinal gutter grade must be met.
2. Use guardrail with shoulder gutter and inlets to collect storm water. If the shoulder slope must be varied then the above criteria for varying the shoulder slope and longitudinal gutter grade must be met.
3. Use guardrail in conjunction with a permanent turf reinforcement mat in fill sections with a front slope steeper than 1:4 and embankment height less than or equal to 10 feet. Storm water will be allowed to flow over the shoulder and the miscellaneous asphalt onto the sodded front slope. Shear stress calculations are required for the design/selection of the permanent turf reinforcement mat.

Design the top of concrete barrier wall profile in such a manner as to create a profile that is similar to the roadway profile and does not 'sawtooth' with a rocking shoulder design. The height of the proposed concrete barrier wall will vary (minimum height per Standard Index) between the high and low points of the special edge of shoulder profile to ensure that the top of the barrier wall profile is relatively constant and generally follows the grades of the proposed profile grade line to avoid undulating conditions.

## 2.5 Borders

### 2.5.1 Limited Access Facilities

*Add the following paragraphs*

On Turnpike resurfacing and widening projects where additional R/W will not be acquired, the minimum border width will be based on the following criteria:

1. The border width accommodates (1) roadside design components such as signing, drainage features, guardrail, fencing and clear zone, (2) the construction and maintenance of the facility and (3) permitted public utilities.
2. Along ramps and mainline lanes where roadside barriers are used and thus clear zone is not applicable, the minimum border width from the back of a barrier or retaining wall must be 10' if maintenance vehicles have sufficient access from public right of way that is contiguous and unimpeded to the Turnpike facility.
3. If the maintenance access is not continuous along a barrier or wall, and thus maintenance vehicles and equipment would need to turn around, then a sufficient turnaround area must be provided that is acceptable and approved by FTE Maintenance.
4. Maintenance accessibility includes the ability for equipment and vehicles to maneuver around obstacles including fences, lights, signs, side slopes and ponds.

This approach does not require a Design Variation.

## 2.6 Grades

**Table 2.6.2 Maximum Change in Grade without Vertical Curves**

*Add following note*

The minimum distance required between VPI's used to develop the Profile Grade Line (PGL) is 3 \* Design Speed.

## 2.8 Curves

### 2.8.1 Horizontal Curves

*Add the following section*

#### 2.8.1.4 Express Lane Separation in Horizontal Curves

On Turnpike facilities, Express Lanes will be either barrier separated or buffer separated with express lane markers. Minimum stopping sight distances requirements per PPM Table 2.7.1 and AASHTO apply. If barrier or express lane markers impede required sightlines around horizontal curves, then a formal Design Exception or Variation is required.

### 2.8.2 Vertical Curves

*Add the following paragraphs*

The minimum vertical curve lengths and minimum K values listed in the notes in PPM Tables 2.8.5 and 2.8.6 require some clarifications and restrictions:

Service Interchanges Per AASHTO, it is intended that a "platform" about 200 feet in length be provided on the ramp in advance of the gore using the Freeway K values.

System Interchanges K values for the higher system ramp design speeds must be used except for the "platform" area.

## 2.9 Superelevation

*Replace paragraph 2 with the following*

The standard superelevation transition places 80% of the transition on the tangent and 20% on the curve. In transition sections where the cross slope is less than 1.5%, a minimum longitudinal grade of 0.5% must be maintained for new and reconstructed alignments. For widening projects where MOT is shown to be cost prohibitive, the inside and outside edge of pavement must maintain a minimum grade of 0.3%.

*Add the following paragraph*

For ramp design speeds less than 35 mph. See AASHTO *Exhibit 3-30 Maximum Relative Gradient* for superelevation transition rates.

## 2.10 Vertical Clearance

*Add the following sentence to paragraph 3*

Existing vertical clearances between 16'-0" and 16'-6" must be maintained or increased, unless otherwise approved by the Turnpike Structures Design Engineer.

**Table 2.10.2 Minimum Vertical Clearances for Signs**

*Change this line of the following table*

ELEMENTS	CLEARANCE
Overhead Sign Structures	18'-0"

## 2.14 Interchanges and Medians Openings/Crossovers

*Add the following section*

### 2.14.5 Crossovers on Turnpike Facilities

Median u-turns throughout the Turnpike are used to accommodate turnarounds between interchanges for maintenance, service, and law enforcement personnel. The primary purpose of the u-turns is to alleviate adverse travel time for emergency vehicles by providing strategic u-turn locations along Florida's Turnpike.

Coordination efforts between Turnpike Production Design, Traffic Operations, FHP Troop K, and Service/Maintenance departments, helped provide the direction needed to identify and develop Turnpike specific criteria for the design and locations (sometimes relocation) of the official use u-turns on the system. Design guidelines from AASHTO's A Policy of Highway and Streets (2004), along with outcome of the internal coordination efforts, were used to develop Turnpike specific criteria during the time when the state was developing standards for crossovers on Limited Access Facilities.

The following is a summary of Florida's Turnpike crossover spacing criteria:

Criteria	Turnpike Requirement
Median width opening	≥ 20 feet (concrete barrier wall separated)

All crossovers within a project's limit are to be evaluated by the design consultant for the spacing criteria and for sight distance deficiency. Findings are to be documented and submitted to the Department for review and an internal decision will be made as to relocate or close the location. In the special case of managed lanes with buffers separating the managed lanes from general use lanes, crossovers will be prohibited. The design consultant will evaluate alternative crossing locations such as bridge abutments or emergency routes through interchanges.

Emergency Crossover Design Guide Drawings can be found at the following link:

<http://floridasturnpike.com/design/tppph.html>

Additional guide drawings are available within the PPM, Chapter 2.

*Add the following section*

## 2.17 Sodding

On resurfacing projects where there is more than 12 feet of travel lane pavement draining to the edge, the **minimum** sod dimension is 2 feet 8 inches. Where there is less than 12 feet of travel lane pavement draining to the edge, the **minimum** sod dimension is 1 foot 4 inches. Typically, the 2 feet 8 inches occurs on the outside shoulder and the 1 foot 4 inches on the inside shoulder.

For all slopes adjacent to new construction or widening, sodding must be used throughout the entire limits of the project.

*Add the following section*

## 2.18 Interchange Fence

On all projects involving interchanges between a Turnpike system facility and any roadway classified as "Urban", use Type B Fence along the limited access right of way within the limits of the interchange unless otherwise approved for the Turnpike Roadway Design Engineer.

Limits of Type B fence within the interchange begin at the theoretical gore point of each ramp and terminate at the end of the limited access right of way adjoining the urban roadway being crossed. Quadrants that do not contain a theoretical gore point will extend Type B fence to the point where the typical mainline right of way is resumed.

*Add the following section*

## 2.19 Parallel Entrance & Exit Interchange Ramps

According to AASHTO, parallel designs are preferred over tapered design. To optimize safety and operations within interchanges, all new construction, widening, and capacity improvement projects must provide parallel entrance and exits unless project specific circumstances warrant the

need for tapered designs. The project specific circumstances must be coordinated with and approved by the Turnpike Roadway Design Engineer and the justification documented in the Design Decisions Journal.

## Chapter 3

### Earthwork

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

#### 3.5 Earthwork Items of Payment

##### 3.5.7 Borrow Excavation (Truck Measure)

*Replace paragraph 2 with the following*

Borrow material, if available, may be obtained from within the right of way of the project, upon approval from the District. Obtaining material from the project right of way must not create an unsafe condition or unprotected hazard. Any borrow excavation occurring within the FDOT right of way must meet the pond dimensional criteria depicted in Figure 5-1 of the FDOT Drainage Manual. The control elevation must be determined if a slope steeper than 1:4 is proposed in order to confirm compliance with Figure 5-1 of the FDOT Drainage Manual. The proposed borrow areas must be reviewed and coordinated with the District Environmental Permit Coordinator, District Drainage Engineer, and District Roadway Engineer.

##### 3.5.9 Summary of Earthwork

*Add the following paragraph*

Specify and quantify material necessary to meet the drainage design requirements, such as select material beneath swales, on fill, and ponds designed to percolate runoff.

## Chapter 4

### Roadside Safety

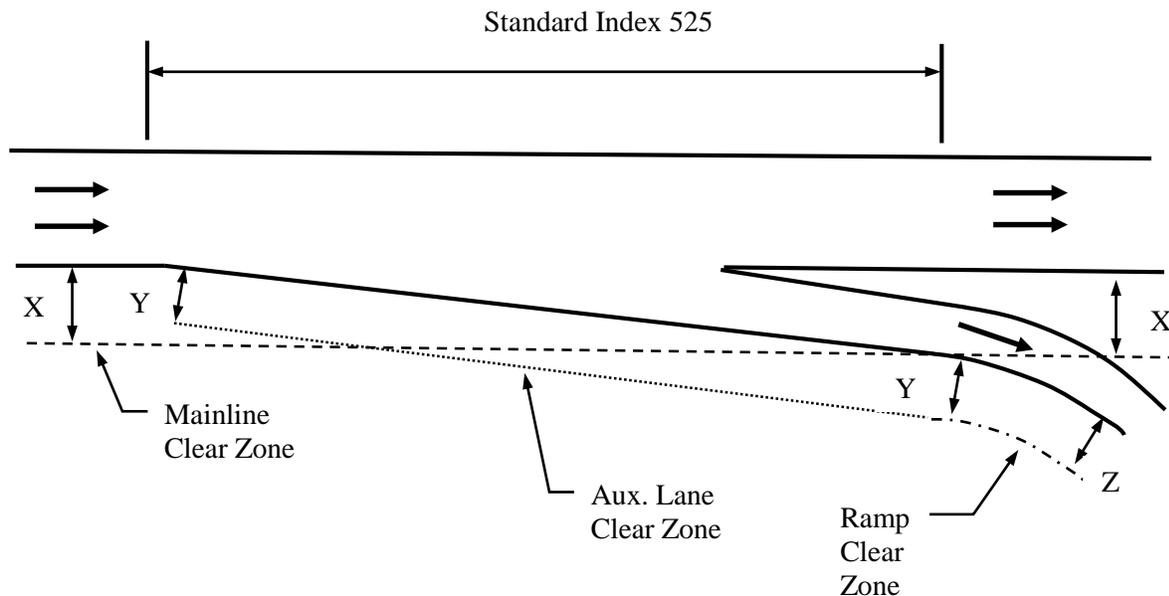
The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

#### 4.2 Roadside Features

##### 4.2.3 Clear Zone Criteria

*Add the following figure*

**Figure 4.2.16 Clear Zones at a Ramp**



#### 4.2.6 Roadside Slope Criteria

##### 4.2.6.1 New Construction Slope Criteria

*Add the following paragraphs*

A 1:2 front slope rate with guardrail can be applied regardless of fill height when constrained conditions exist, which requires approval from FTE Roadway, Drainage and Maintenance.

5 feet from face of guardrail to the beginning of the 1:2 cut slope must be provided on all guardrail and 1:2 cut slope applications to allow for a 5 feet guardrail deflection. If a concrete

barrier is used instead of guardrail and shoulder gutter, then a 4 feet wide level bench must be constructed within the fill behind the barrier before proceeding with a 1:2 slope.

New permanent slopes steeper than 1:2 require approval from FTE Roadway, Drainage, Geotechnical and Maintenance. Where the slopes are deemed too steep to perform maintenance by FTE, provide concrete pavement on slopes.

## 4.3 Roadside Hazards

### 4.3.2 Canal Hazards

*Add the following paragraphs*

Florida's Turnpike Enterprise defines a water body as a natural or manmade feature, such as a pond, lake, ditch or canal that has a depth of water of 3 feet or more for an extended period of time (24 hours or more), as measured from the seasonal high water level or control elevation, to the water feature's bottom elevation.

Provide shielding for all water bodies within the interchange areas.

Evaluate whether shielding is required for all water bodies within Turnpike right of way, as well as water bodies that run along and may fall slightly outside of Turnpike right of way. Evaluation must include the review of traffic data, facility characteristics, 5 year crash history, and a cost estimate of recommended improvements.

Modification for Non-Conventional Projects:
Delete the above paragraph and see RFP for specific shielding requirements.

## 4.4 Longitudinal Barriers, Barrier Transitions, End Treatments & Crash Cushions

### 4.4.1 Standard Longitudinal Barriers

#### 4.4.1.1 Flexible Barrier

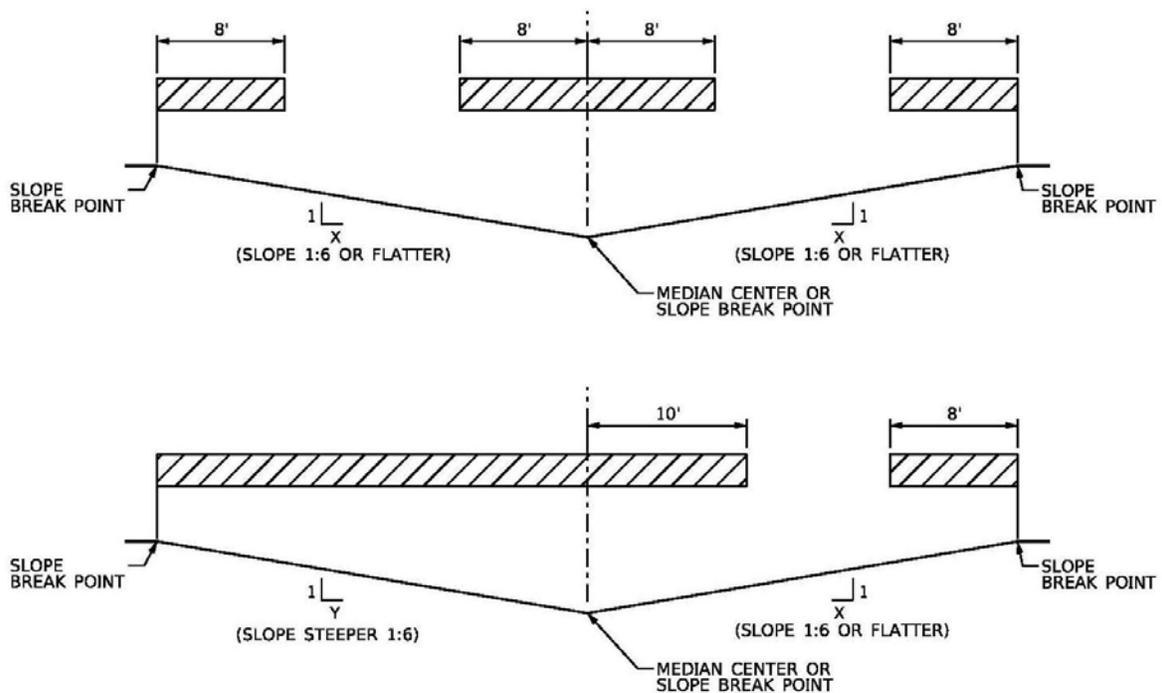
*Add the following paragraph*

The following criteria apply to the placement/location of high tension cable barrier and are supplement to Developmental Specification 540 High Tension Cable Barrier System.

1. The maximum slope a high tension cable barrier must be placed on is 1V:6H, with preferred slope of 1V:10H.

2. High tension cable barrier cannot be placed between the front slope break point and 8' from the break point or median center when the approach slope is 1:6 or flatter; or 10' from the break point if the front slope is steeper than 1:6. See figure below for clarification.
3. Post spacing must be installed such that the dynamic deflection is no more than a maximum of 8 feet.
4. End anchors must be protected from vehicle impact with rigid barrier, guardrail, or overlapping cable barrier to avoid collapse of the cable barrier thereby losing median crossover protection.
5. For all median applications retro-reflective sheeting must be specified on both sides of the posts in the contract documents.

**Figure 4.4.14 Flexible Barrier Placement**



THE CROSS HATCHED AREAS IN THE FIGURE INDICATE THE LATERAL POSITIONS WHERE THE CABLE BARRIER MAY NOT BE EFFECTIVE AND SHALL NOT BE PLACED.

### **4.4.1.2 Semi-Rigid Barrier**

*Add the following paragraph*

The treatment of guardrail post installed in areas with soils that exceed the standard AASHTO soil requirements for guardrail post must conform to the W-Beam Guardrail Installations In Rock and In Mowing Strips Detail Guide Drawing which can be found at the following link:

<http://floridasturnpike.com/design/tppph.html>

## **4.4.6 Barrier Placement**

### **4.4.6.4 Median Barriers**

*Add the following section*

#### **4.4.6.4.1 Median Barrier Grading Requirements**

The most desirable median slope is one that is relatively flat with slopes at 1:10 or less in lieu of the standard 1:6 median typical section slopes. The slopes ahead and in front of guardrail installation are particularly critical on the older/narrow medians of 40 feet or less in width (see AASHTO Roadside Design Guide). In most cases, regrading will require the median ditch profile to be realigned horizontally and vertically. Therefore, drainage and earthwork in these areas need special attention in developing the typical sections and drainage profiles.

*Add the following section*

#### **4.4.6.7 Access Openings**

On projects that add roadside barrier to existing facilities (e.g. canal protection, spot/system wide safety improvement projects) the designer must strategically locate access points such that maintenance and operation crews can conveniently access existing infrastructure, particularly facilities that may already be placed outside the clear zone and would not be accessible from the shoulder. In addition, the maximum continuous length of a guardrail run along the outside of the roadway is 2,500 between end terminals. When long guardrail runs need to be broken up or an opening provided to access roadside facilities an access opening must be provided. The Designer must coordinate with FTE Maintenance and ITS on the final access location points to ensure these locations meet the needs for maintenance & operations.

The preferred typical detail for roadside guardrail access openings along Turnpike facilities can be found at the following link:

<http://floridasturnpike.com/design/tppph.html>

## **4.4.7 Warrants for Roadside Barriers**

### **4.4.7.2 Shielding Requirements**

*Add the following paragraph*

Light pole foundations are not considered a hazard if built in accordance to Standard Index 17500, though the roadway slope may cause a portion of the foundations to protrude more than 4" in height.

## **4.7 Upgrading Existing Barrier Systems**

*Add the following paragraphs*

For added capacity and reconstruction projects, existing guardrail sections that do not meet current mounting height design standards must be replaced or upgraded to meet current standards. If the run of guardrail extends beyond the project limits, then a 25 foot transition detail will be used to connect to the existing guardrail.

For resurfacing and spot or system wide safety improvement projects, existing guardrail sections that do not meet current mounting height design standards AND are impacted by project improvements must be replaced or upgraded such that the entire run of guardrail is upgraded/replaced to meet current standards. If the run of guardrail extends beyond the project limits, then a 25 foot transition detail will be used to connect to the existing guardrail. Existing guardrail not impacted by the design of the project improvements, is not required to be upgraded or replaced.

## **Chapter 5**

### **Utilities**

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

*No changes to the entire chapter*

## **Chapter 6**

### **Railroad Crossing**

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

*No changes to the entire chapter*

## Chapter 7

### Traffic and ITS Design

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

#### 7.1 General

*Add the following paragraphs*

Florida's Turnpike Enterprise has developed Traffic Plans Guide Drawings to establish guidelines for traffic design and traffic engineering plan development. The Guide Drawings attempt to improve the quality of plans, provide system consistency, reduce plan development time and reduce plan review time. The Guide Drawings represent the compilation of engineering manuals, best practices and effective design experience on Florida's Turnpike. The Guide Drawings show layouts and details of an example condition.

It is the responsibility of the Design Engineer of Record using these Guide Drawings to exercise proper engineering judgment and prepare a safe and effective design that fits the specific conditions of a project. The inappropriate use of and adherence to these Guide Drawings does not exempt the engineer from the professional responsibility of developing an appropriate design. Design engineers and consultants are encouraged to become familiar with the information contained in the Guide Drawings and to discuss specific design details with Florida's Turnpike design staff.

The Traffic Plans Guide Drawings are available as .dgn and .pdf at the following link:

<http://floridasturnpike.com/design/tppph.html>

Ancillary structures should not be placed in drainage features. If project geometry or other constraints require the placement of an ancillary structure in a drainage feature, coordinate with the Drainage Engineer to confirm these structures and their associated components are placed above the appropriate elevation as follows:

- Treatment Swales – Weir Elevation
- Conveyance Ditches – Normal Depth
- Stormwater Ponds – Design Storm Peak Stage
- Floodplain Compensation or Other Systems – Seasonal High Water Level

Provide the applicable elevation in the component specific cross sections/typicals.

## 7.2 Signing

### 7.2.1 Design Criteria

*Add the following to paragraph 1*

The placement of signs must prevent subjecting motorists to too much information, not interfere with other traffic control devices, not impair the visibility of other signs and not violate minimum spacing distances listed in Table 1, Minimum Spacing Distances for Signs in Florida Administrative Code 14-51.014. Table 1 provides the minimum spacing requirements and the design should maximize the sign spreading concept in MUTCD 2E.11 when possible. In addition, the minimum sign spacing between a Dynamic Message Sign (DMS) and guide signs/directional signs should be 1000 feet, when the guide sign is upstream of the DMS sign.

*Add the following to paragraph 2*

The designer must consider the physical placement of sign supports as well as the visibility of the sign panel. Clearing and grubbing should be included if the visibility of the sign panel is blocked. Refer to the Traffic Plans Guide Drawings for guidance.

The design for sign location must consider the cross section as to the placement of the sign structure foundation outside the clear zone. Signs located behind guardrail must be located at the minimum setback required from the face of guardrail. This applies to the foundations on overhead signs and for the sign panel for ground mounted signs.

*Add the following paragraphs*

All advance guide signs should use the physical gore as the point of reference for distance messages. The only time this should not be done is if the physical gore and theoretical gore are separated by more than 500 feet.

Destination guide signs on ramps must include destinations that repeat advance guide sign and supplemental guide sign information and provides route guidance to the driver.

Follow Typical Off Ramp Signing Diagrams, located on Turnpike Design Internet, for Advisory Speed Warning Signing at all Turnpike exit ramps.

For all post-interchange distance signs on the Turnpike, the maximum letter height used must be 10" E or 10" EM.

For size of signs, lettering and plaques, Florida's Turnpike facilities must follow the Freeway Classification in MUTCD Tables 2B-1, 2C-2, 2E-4 and 2E-5. The minimum sizes for regulatory and warning signs on exit or entrance ramps to/from Turnpike facilities must be Freeway Classification as well.

## 7.2.2 Overhead Signs on Freeways and Expressways

*Replace item 3 under paragraph 2 as follows*

Mount advance guide signs and exit direction signs on overhead structures when the number of travel lanes in one direction is three or more. Supplemental guide signs must remain ground mounted under sections of three or more travel lanes.

*Add the following paragraphs*

Overhead sign installations must meet the vertical clearance requirements of TPPPH Section 2.10, Table 2.10.2.

The final express lane toll rate sign prior to an express lane ingress must be supported on a mid-or full-span structure. See the latest edition of the General Tolling Requirements (GTR) Manual with amendments in effect for additional criteria for this structure.

## 7.2.4 External Lighting of Overhead Signs

*Add the following paragraph*

If a sign panel on an existing structure is being replaced, all signs on the structure should be consistent. For example, if a structure has three existing signs with lights, one panel is being replaced, the plans should call for either A) lights on the new panel or B) the other two panels replaced with Type XI sheeting and removal of the lights.

## 7.2.5 Signs on Median Barriers and Traffic Railings

*Modify the list in paragraph 1*

Add “Do Not Stop” (TPK-7) to the list of permanent signs critical to safety.

## 7.2.8 Delineators, Object Markers and Express Lane Markers

*Add the following to paragraph*

On Turnpike facilities, Express Lanes will be either barrier separated or buffer separated with express lane markers. Standard specifications for the express lane markers used in this application have not yet been developed. Therefore, a Modified Special Provision is required and must be included in the contract to define requirements for color, height, retroreflectivity, spacing, and mounting technique. The Turnpike Traffic Engineer must be consulted on this item.

<b>Modification for Non-Conventional Projects:</b>
Delete the last sentence of the above paragraph and see RFP for delineator requirements on Turnpike Express Lane projects.

*Add the following section*

## 7.2.11 Toll Route Markers

The Florida's Turnpike mainline must use the Turnpike Route Marker sign panel shown in the most current Guide Drawings.

For all other Turnpike operated facilities the Toll Route Marker must be used as shown in the Traffic Engineering Manual, Section 2.23. The size of this panel must meet the standards in the TEM with the following exception:

1. For identification along the mainline (i.e., Post Interchange Sign) – 36" x 48"

The width of the attached cardinal direction sign, directional arrow auxiliary sign, or other auxiliary sign must match the width of the parent route marker sign.

On the side streets, leading to the Turnpike Mainline, use the Toll Auxiliary Sign (M4-15) in combination with the Turnpike route marker. On numbered routes, such as Toll Route 869, use the Toll Route Shield (FTP-79-06, FTP-80-06, or FTP-81-06) without the additional Toll Auxiliary Sign.

*Add the following section*

## 7.2.12 Truck Lane Restrictions

The design engineer must include truck lane restriction signs on corridors that have three or more lanes in each direction of travel.

Sample panel designs for the restriction are included in the Guide Drawings. The design engineer should implement the signs similar to a post-interchange sign so that drivers entering the system are informed at each entry point. If installation of the truck lane restriction sign is not possible on the mainline due to sign clutter, the truck lane restriction sign can be implemented on the entrance ramp after the toll plaza, when necessary, to maintain proper sign spacing.

## 7.3 Lighting

Florida's Turnpike Enterprise has developed Lighting Guide Drawings to establish guidelines for lighting design and plan development. The Lighting Guide Drawings are available as .dgn and .pdf at the following link:

<http://floridasturnpike.com/design/tppph.html>

Projects including lighting design must comply with applicable standards. In addition to the Department's Standard Specifications, the following standards should be consulted:

***Roadway Lighting Design Guide, AASHTO*** - This is the basic guide for highway lighting. It includes information on warranting conditions and design criteria.

**Design Standards** - These indices are composed of a number of standard drawings or indexes which address specific situations that occur on a large majority of construction projects.

**Recommended Practice for Roadway Lighting IES RP-8-00 (R2005), ANSI/IESNA.**

**American National Standard Practice for Tunnel Lighting IES RP-22-11, ANSI/IESNA.**

**The IESNA Lighting Handbook Reference & Application, IESNA.**

**Federal Aviation Regulation, Part 77, Safe, Efficient Use, and Preservation of the Navigable Airspace, USDOT/FAA.** This regulation sets the requirements to follow on projects near airports.

**Federal Aviation Administration Advisory Circular AC 70/7460-1, Obstruction Marking and Lighting, FAA.** This advisory circular defines the requirements to follow to identify objects that require special lighting near airports.

**Federal Aviation Administration Advisory Circular AC 150/5345-43, Specification for Obstruction Lighting Equipment, FAA.** This advisory circular contains the FAA specification for obstruction lighting equipment.

**Manual on Uniform Traffic Studies (January 2000) Chapter 15 Highway Lighting Justification Procedure, FDOT.**

### 7.3.1 Design Criteria

*Add the following paragraphs*

All design considerations must be documented in the Lighting Design Analysis Report (LDAR). It must be the responsibility of the design consultant to coordinate with maintaining agencies to ascertain their preferences and obtain all other pertinent information required to provide a design that is acceptable to the department.

Lighting pole layout and design must employ practices, where possible, to reduce the risk of light poles in high crash and high risk locations. Some of these design considerations are, but not limited to: lane drop and intersection locations, sections of roadway where the paved shoulder narrows, and curve/vehicle departure directions.

Conventional lighting should be used for all Florida Turnpike roads. Conventional roadway lighting luminaires for Florida Turnpike roads must be pole top style. This requirement is based on aesthetic and logistical synchronization with existing facilities.

Modification for Non-Conventional Projects:
Conventional lighting must be used unless directed otherwise in the RFP.

Conventional lighting must be shoulder mounted. Median mounted poles are not allowed. If a geometric or safety concern exists related to shoulder mounting, median mounted poles will be

considered. In these cases, approval is required by the Turnpike Project Manager, Turnpike Electrical Engineer, and Turnpike Maintenance. Median mounted poles must be limited to the area of geometric or safety concern.

Modification for Non-Conventional Projects:
---

Shoulder mounted poles must be used unless directed otherwise in the RFP.
---

High mast lighting may be considered where conventional lighting is proven not feasible and the surrounding area is not residential or environmentally sensitive. The consultant must obtain approval from the Turnpike Electrical Engineer, Turnpike Structures Maintenance, and Project Manager before considering high mast lighting.

Modification for Non-Conventional Projects:
---

High mast lighting must not be used unless directed otherwise in the RFP.
---

High mast lighting must not be located in the following locations and must meet horizontal clearance requirements specified in PPM, Vol. 1 Chapter 2:

- a. Steep Embankments
- b. Steep Slopes in Slope Pavement
- c. Adjacent to Slope Embankment Cut-Outs
- d. With Buried Pole Bases
- e. In areas not accessible to a crane for aerial basket work.

Projects with conventional lighting along the roadside must be designed for an average initial illumination as indicated in Table 7.3.1. Projects with high mast lighting must be designed for an average initial illumination as indicated in Table 7.3.2 Rest areas and Service Plazas must be designed for an average initial illumination as indicated in Table 7.3.5. This includes the ramps to and from the Service Plazas.

If the adjoining mainline roads are not illuminated, then the lighting design must include mainline transition lighting to allow a driver a reasonable reduction in lighting levels from a lighted roadway to an unlit road. The mainline transition lighting must extend beyond the project lighting limits by approximately four-to six- pole spacing. The mainline transition illumination levels must be 1.0 foot candles average initial intensity (horizontal foot candles) with the same uniformity ratios specified in Table 7.3.1.

If the length of the mainline between any two lighted areas (roadway sections, interchanges, service plazas, and/ or tolls plaza) is 0.5 mile or less, then that section of the mainline must be lighted regardless of what the Lighting Justification Report indicates.

All widening and resurfacing projects must be reviewed for compliance with current lighting criteria. Project begin and end limits must define project lighting scope to be considered, regardless of the limits of resurfacing unless otherwise noted. All deficiencies within the project scope must be addressed and corrected. Deficiencies outside the project scope must be brought to the attention of the Turnpike Project Manager and Electrical Engineer.

Projects with highway speed tolling gantries are not required to have roadside lighting unless dictated by another section of the TPPPH and/or a Lighting Justification Report. Where roadside lighting exists, the roadway lighting must be reviewed for compliance with current lighting criteria and General Tolling Requirements. All deficiencies within the project scope must be addressed and corrected. Deficiencies outside the project scope must be brought to the attention of the Turnpike Project Manager, Tolls and Electrical Engineer.

Where new poles and luminaires are being proposed, all poles, luminaires, foundations, and infrastructure within the project scope must be new.

**Modification for Non-Conventional Projects:**

All poles, luminaries, foundations and infrastructure must be new unless directed otherwise in the RFP.

**Table 7.3.1 Conventional Lighting – Roadways and Signalized Intersections**

*Replace the following table*

ROADWAY CLASSIFICATIONS	ILLUMINATION LEVEL AVERAGE INITIAL (H.F.C)	UNIFORMITY RATIOS		VEILING LUMINANCE RATIO
		AVG/MIN	MAX/MIN	L <sub>v</sub> (max)/L <sub>avg</sub>
INTERSTATE, EXPRESSWAY, FREEWAY, MAJOR ARTERIALS & HIGHWAY SPEED TOLLING GANTRIES	1.7	4:1 or Less	10:1 or Less	0.3:1 or Less
ALL OTHER ROADWAYS	1.0	4:1 or Less	10:1 or Less	0.3:1 or Less
*PEDESTRIAN WAYS AND BICYCLE LANES	2.5	4:1 or Less	10:1 or Less	0.3:1 or Less

**Note:** These average illumination values should be considered standard, but should be increased if necessary to maintain an acceptable uniformity ratio. The maximum illumination level average initial horizontal foot-candle value must be 2.25 FC for Interstate, Expressway, Freeway, Major Arterials, and Highway Speed Tolling Gantries. The maximum illumination level average initial horizontal foot-candle values must be one and one-half values for All Other Roadways, Pedestrian Ways, and Bicycle Lanes.

\* This assumes a separate facility. Facilities adjacent to a vehicular roadway should use the levels for that roadway.

**Table 7.3.2 Highmast Lighting – Roadways***Replace the following table*

ROADWAY CLASSIFICATIONS	ILLUMINATION LEVEL AVERAGE INITIAL (H.F.C)	UNIFORMITY RATIOS	
		AVG/MIN	MAX/MIN
INTERSTATE, EXPRESSWAY, FREEWAY, MAJOR ARTERIALS & HIGHWAY SPEED TOLLING GANTRIES	1.0	3:1 or Less	10:1 or Less
ALL OTHER ROADWAYS	1.0	3:1 or Less	10:1 or Less

**Note:** These average illumination values should be considered standard, but should be increased if necessary to maintain an acceptable uniformity ratio. The maximum illumination level average initial horizontal foot-candle values must be one and one-half values for Interstate, Expressway, Freeway, Major Arterials, Highway Speed Tolling Gantries, and All Other Roadways.

**Table 7.3.5 Sign Lighting***Replace the following table*

AMBIENT LUMINANCE*	ILLUMINATION LEVEL AVERAGE INITIAL (H.F.C)	UNIFORMITY RATIOS
		MAX/MIN
LOW	5.0 to 10.0	6:1
MEDIUM	10.0 to 20.0	6:1
HIGH	20.0 to 40.0	6:1

\* Ambient luminance classifications are defined in Section 10.3 of the AASHTO Roadway Lighting Design Guide (2005). Refer to the Traffic Plans Guide Drawings for information on sign panel sheeting used on Turnpike projects.

**Table 7.3.7 Rest Area Lighting***Replace title with the following***Table 7.3.7 Rest Area and Service Plaza Lighting***Replace the following table*

AREA ILLUMINATED	ILLUMINATION LEVEL AVERAGE INITIAL (H.F.C)	UNIFORMITY RATIOS	
		AVG/MIN	MAX/MIN
ENTRANCE AND EXIT	1.7	4:1 or Less	10:1 or Less
INTERIOR ROADWAYS	1.5	4:1 or Less	10:1 or Less
PARKING AREAS	1.5	4:1 or Less	10:1 or Less

**Note:** These average illumination values should be considered standard, but should be increased if necessary to maintain an acceptable uniformity ratio. The maximum illumination level average initial horizontal foot-candle values must be one and one-half values.

*Add the following section*

### 7.3.1.1 Underdeck Lighting

Underdeck lighting must be mounted to pier caps, end bents, or walls. If pendant hung fixtures are required to meet criteria, special attention should be given to locate fixtures over shoulders, gore areas, other separations from traffic. If pendant hung fixtures are required over live traffic lanes, the fixture locations must be coordinated with the Turnpike Electrical Engineer and Turnpike Maintenance. Additional coordination with the Department's central office will be required where use of pendant lighting is recommended prior to final design submittal and must be coordinated with the Turnpike Project Manager. All pendant hung fixtures must have a redundant method of support, designed, signed and sealed by a Structural Engineer.

#### 7.3.1.1.1 Nighttime Underdeck Lighting

Where there is continuous roadway lighting during the night, roadways under bridge structures must be lighted to the same level (or criteria) of the adjacent roadway. If the adjacent roadway is not lighted, lighting under bridges structures is still required where there is frequent nighttime pedestrian traffic; or where unusual or critical roadway geometry occurs adjacent to or under the bridge structure.

#### 7.3.1.1.2 Daytime Supplemental Underdeck Lighting

Tunnel or daytime lighting may be required when the bridge structure limits natural sunlight penetration and limits a driver's visibility under the structure. Evaluation of existing/proposed roadway design regarding the need for Tunnel or Daytime lighting must be included in the Lighting Design Analysis Report. Tunnel or Daytime supplemental lighting shall be provided as warranted

by evaluation or as required by the Department. These requirements include not only Turnpike facilities, but any roadway crossing under a Turnpike facility.

i. Methodology

Methodology from the ANSI/IES RP-22-11 Tunnel Lighting guide shall be used to determine the need for daytime supplemental lighting for FTE underpasses. ANSI/IES RP-22-11 provides Table 2 and Table 3 for determining the need for daytime lighting of tunnels/underpasses and for preliminary determination of the target luminance value for threshold zone lighting.

When the adjustment factor per Table 2 is zero, no daytime lighting is recommended.

No daytime lighting is recommended for underpasses of 80' or less.

No daytime lighting is recommended for underpasses between 80' and 250' with traffic volume below 15000 AADT if they have good daylight penetration and good wall reflectance.

**\*Note: However where skewed roadway geometry, pedestrian/bike facilities, or local jurisdictional request are present, a daylight study (per department procedure and with consideration of these factors) shall be performed to verify need for daytime lighting.**

- a. The designer shall consider several factors when determining the proper adjustment factor from Table 2:
  1. Exit Visibility- Where the exit is completely visible from the site safe stopping distance, the silhouette of objects beneath the underpass against the bright aperture at the exit may provide better detection by contrast for a driver. Designer makes an assessment as to whether the roadway beneath the underpass is straight and will allow contrast detection from the driver's viewpoint at the site safe stopping distance. This would be considered "good" exit visibility. Otherwise, for example where curved roadways (horizontal curve with radii of 880 ft. or less in rural areas, 2500 ft. or less in urban areas) are present beneath the underpass, the exit shall not be considered visible.
  2. Daylight penetration- Where openings in the bridge/underpass structure allow light to enter, natural lighting will assist the overall luminance level. Designer makes an assessment of daylighting through openings such as entrance/exit portal, columns, wall embankments beneath the underpass, and median separations (10 ft. or greater) between the bridges. The recommended method for determining daylight penetration for proposed/existing would be use of 3-D modeling lighting

simulation software with daylighting features (i.e. AGi32). For existing bridge daylighting retrofits, results from software simulation may be field verified using photometric meters at the site prior to completion of design.

3. Reflectance of Underpass Walls- For narrow underpasses, retaining walls help to improve the luminance on the pavement due to the amount of light that will be reflected. For wide underpasses with three or more lanes and those with embankments, the reflectance will have much less of an effect due to the inter-reflection between the bridge deck and embankment surfaces. Designer makes an assessment based upon the material reflectance (i.e. concrete reflectivity varies between 20-30%, see Department recommended reflectivity below) of the underpass surfaces.
  4. Traffic Volume & Pedestrian/Cyclist traffic- Underpasses in urban areas are likely to have high traffic volume and pedestrian/cyclist traffic, therefore daytime lighting will be required where underpasses exceeding 80 ft. as indicated per Table 2.
- b. The designer shall determine the pavement luminance value from Table 3 and apply the adjustment factor from Table 2. Further reduction of luminaires shall be considered based upon Figure 8 of the ANSI/IES RP-22-11 guide.
  - c. The designer shall perform a daylight study using lighting simulation software capable of 3-D modeling of proposed underpasses and with features required to account for contribution of sunlight per weather station data. Study shall be performed at 9am, 12 noon, & 3pm at proposed underpass locations.

Average luminance value in the threshold zone of the underpass shall be determined per Tables 2 and 3 of the RP-22-11 guide. Reduction of luminaires over the latter half to the threshold zone, per Figure 8 of the ANSI/IES RP-22-11 guide, shall be allowed except in cases where the length of the tunnel is less than the calculated threshold zone length. A Daylight study (to be included in the LDAR) shall be performed by software simulation and field investigation to account for sunlight that may contribute to achieving the overall luminance value at the roadway beneath the underpass. See recommended surface material reflectivity percentages for use in software modules following the recommended procedure below. Uniformities shall meet criteria as described in TPPPH Table 7.3.1 above.

**Procedure for Design of Photometrics for Daytime Lighting (ANSI/IES RP-22-11 and AGi32 or equivalent software will be needed to implement this procedure.)**

1. Determine the AASHTO SSSD per Table 1. (notes: Typical underpass will likely be determined to be evaluated for Threshold zone only lighting; calculations shall be performed to confirm this assumption)

2. Determine Threshold zone luminance value.
  - a. Per Table 2, evaluate table parameters to determine adjustment factor.
  - b. Evaluate proposed roadway “scene” and select scene per Figure 3.
  - c. Evaluate and determine the “Suggested Maintained Average Pavement Luminance Levels in the Threshold Zone of Vehicular Tunnels”, per Table 3.
  - d. Apply adjustment factor from 2a.
  - e. Apply reduction per Figure 8.
3. Perform Daylight study for proposed underpass (note: AGi 32 lighting software is recommended; other equivalent software/field methods may also be used. Considerations include but may not be limited to: luminance contributions from the sun, material reflectance, underpass orientation, etc. per ANSI/IES RP-22-11).
  - a. Create a proposed underpass model. (note: Model shall include but not be limited to: all surfaces that reflect light, any openings, roadway layout below underpass, bridge structures beneath underpass, as well as other contributors)
  - b. Apply surface reflectivity characteristics (note: Recommended material reflectivity characteristics may be obtained from the Department, see Table 7.3.1.1 below).
  - c. Create calculation zones for roadway beneath proposed underpass (note: Data points near the edges of the underpass may artificially inflate the luminance average. It is recommended that those data points not be considered in the overall average Luminance. Points within the first 5 ft. of the entrance and exit portals shall not be included in the overall average. Uniformities shall meet requirements of requirements of Table 7.3.1.)
  - d. Run Daylighting module and calculate average luminance values within calculation zones established in 3c. (note: site location coordinates will be required for weather station data. Luminance value determined in previous step 2 shall be used. Daylight module study shall be run assuming the orientation of the sun at 9am, 3pm, and 12 noon (as a worst case scenario).)
  - e. If average luminance value cannot be met using daylight, then layout supplemental wall mount luminaires beneath underpass as needed to meet the average value. Use of nighttime luminaires in conjunction with the daytime supplemental luminaires may be required. (note: Designer’s goal should be to meet the average luminance value using the least amount of fixtures.)
  - f. Adjust, re-run daylight module and re-calculate as needed to meet the average luminance value as determined in Step 2 above.

**Table 7.3.8: Material Reflectivity**

Material (Surface)	Recommended Reflectivity
Concrete	0.25
Steel	0.20
Asphalt	0.38

Deliverables from the daylighting study shall include, but not be limited to:

- snapshots of all 3-D views of underpass models
- summary of luminance value achieved with point to point photometrics layout that shows the calculation zones
- all designer's assumptions/judgements made to support the study

Design of construction plans shall follow Department requirements. Coordination with TPK Structures, power utility, and Electrical Design sub-consultant (if separate from lighting designer) may be required.

**Modification for Non-Conventional Project:**

Average pavement luminance value for daytime lighting shall be implemented as directed in the RFP.

*Add the following section*

### **7.3.1.2 Box Girder Maintenance Lighting and Power**

No welding or burning of the structure will be allowed. All fasteners must be approved mechanical devices. The electrical work associated with the box girders involves working in confined space areas. All precautions and rules according to "confined spaces" of the Code of Federal Regulations, 29 CFR 1910.146 must apply. Emergency lighting must be provided within each box girder per NFPA 101.

The minimum conductor size must be No. 10 AWG. A green insulated conductor must be installed in each conduit run. The minimum conduit size must be 1 inch.

The six-hour timers must control the lighting contactors. Timers must be provided at each hatch entrance and mid span.

The light fixtures must be connected to branch circuit breakers separate from the receptacle branch circuit breakers.

The service voltage for the box girders must be 240/480 volts, single-phase, three-wires and then step down to the 120/240 volts through the mini power centers. A main disconnect switch must be provided immediately adjacent to the hatch door of each girder. The 240/480 volt-feeder must terminate in a distribution panelboard. The distribution panelboard must provide 480 volt power to each mini power center.

The number of mini power centers within each box girder must be determined based on the number of lights and receptacles. The maximum number of lights and receptacles within a mini power center must be as indicated on Structural Index No. 21240.

*Add the following section*

### **7.3.1.3 Lighting Load Center and Wiring Criteria**

The standard service voltage for the roadway lighting load centers must be 240/480 volts, single-phase, three-wires.

Roadway lighting load centers must be coordinated with utility provider prior to Phase III Plan Submittal. Utility transformers must be sized for connected and spare loads. Consideration must be given for utility standard transformer sizes and limitations. Where a lighting load exceeds typical utility transformer sizes, the lighting load must be split and multiple load centers provided to serve the load unless approved otherwise by Turnpike Electrical Engineer.

FDOT Design Standard Index No. 17504 (Service Point Details) and Turnpike Lighting Guide Drawings must be coordinated with the utility provider's requirements for electrical service (or electrical service standards). The electrical service point must be designed to and meet all utility provider's requirements.

The load center location and surrounding area must have a minimum of 1'-0" between the load center and the designer's high water elevation.

Load center enclosure minimum dimensions must be as shown in the Turnpike Lighting Guide Drawings.

Where a load center is being replaced and existing poles, equipment, etc. are being re-fed, all equipment and identification labels must be replaced to include the new load center designation and circuit. Coordination with Turnpike Maintenance Engineer must be conducted as needed to properly update identification of equipment.

The voltage for the roadway luminaires must be 480 volts, single-phase, two-wires.

Roadway lighting circuit conductors must not be larger than #1 AWG. Circuits requiring conductors larger than #1 AWG must be coordinated with the Turnpike Electrical Engineer and Turnpike Maintenance.

Where existing conductors within a circuit are being replaced, the size of the new conductors must not be smaller than the existing conductors.

Dedicated circuits must be provided for daytime supplemental underdeck lighting. Daytime dedicated circuits must be in separate conduits from roadway lighting circuits. Where conduits are run in the same trench with roadway lighting conduits, the conduits must be separated in the pull boxes. Dedicated daytime lighting circuit conduits must be wrapped with electrical hazard tape in the pull boxes. Dedicated daytime lighting circuit conductors to be identified with an additional tag that states the conductors are live 24 hours a day, seven days a week.

Underdeck light fixture mounting details must be provided. Light fixtures/associated conduit may be field routed. Attachment of lighting equipment/associated conduit to MSE wall panels is not

allowed. Attachment of lighting equipment/associated conduit to MSE copings is acceptable. Attachment to other bridge elements must conform to the Structures Design Guidelines Appendix 1A.

Roadway lighting must be connected to alternate circuits to prevent a total blackout of any section of the highway in the event a circuit is out of service. Minor replacements must be evaluated on a case by case basis.

<b>Modification for Non-Conventional Projects:</b>
--

Roadway lighting must be connected to alternate circuits unless directed otherwise in the RFP.
--

The maximum distance between pull boxes and/or splice boxes in long conduit runs must be 300 feet.

A special power distribution design is required when new poles and luminaires are being proposed behind Noise Barriers (Sound Walls). Conduit, junction boxes, and pull boxes must not be installed behind Noise Barriers (Sound Walls). Provide conduit, junction boxes, and pull boxes in front of Noise Barriers (Sound Walls) on the roadside.

There must be no more than three circuits in a single conduit. Provide multiple conduits as needed in the plans.

All roadway crossings must be provided with a spare conduit and provided with a dedicated pull box at each end of the crossing road. Use of light pole pull boxes is not allowed, where space is sufficient for providing dedicated pull boxes.

All pull boxes and splice boxes must be Tier 22 load rated with Tier 22 rated covers. Metal lid covers must be avoided, unless otherwise approved by Turnpike Electrical Engineer and Turnpike Maintenance. All other pull and splice box requirements, per FDOT specifications, must also remain applicable.

*Add the following section*

### **7.3.1.4 Temporary Lighting Criteria**

The design of temporary lighting must meet the criteria shown in section 7.3.1. If this criteria cannot be met based on various factors of construction, the Design Engineer of Record must submit a safe and effective design, using proper engineering judgment to the Turnpike Project Manager and Turnpike Electrical Engineer for review and approval.

*Add the following section*

### **7.3.1.5 Pole Design Criteria**

It is desirable not to locate any light poles on highway bridges. Spacing must be adjusted, if possible, to keep light poles off bridge structures including the approach slabs. Bridge mounted

light poles are not desirable and should be avoided where possible. If light poles are required on bridges, their location must be closely coordinated with the Bridge Structural Designer. Bridge-mounted poles must have pull box as specified in FDOT Standard Index No. 21210.

Nominal mounting heights for conventional poles must be 40 and 50 feet as specified in FDOT Standard Index No. 17515. Nominal mounting heights for highmast poles must be between 80 and 120 feet as specified in FDOT Standard Index No. 17502. In cases where lower or higher mounting heights are required to meet minimum lighting design criteria, the designer must contact the Turnpike Electrical Engineer for approval and coordination. Technical special provisions and details must be provided in those cases where special designs are required. Technical special provisions must be signed and sealed by a Professional Engineer, licensed in the State of Florida. Vibration dampers and pads must be provided for all shoulder-mounted poles with pole-top mounted luminaires having mounting heights over 40 feet. All conventional light poles must be provided with breakaway transformer-type bases except when mounted on bridge traffic railing barriers or on barrier walls. Conventional light poles in parking lots must not be provided with frangible bases.

Conventional light poles must be aluminum and must not be painted. High mast light poles must be galvanized steel only.

A concrete slab is not required in those instances when the poles are located behind sidewalks. The pull box must be located flush with the sidewalk in front of the light pole, and is paid for as "roadside".

A combination pole and pull box concrete slab is not required where the grade is 1:2 or greater and protected by guardrail.

All foundations and pull boxes must be coordinated with current and future grading to ensure that the top of the foundations and the pull boxes are not below grade. In addition, foundations, boxes (pull, splice, junction or similar), and lighting equipment must not be located within the limits of any drainage systems or other locations where water and debris may accumulate.

All components of the pole cable distribution system must be listed by a Nationally Recognized Testing Laboratory.

The pole cable distribution system must be installed in the pull box adjacent to each light pole.

A pole cable distribution system that is installed inside the pole base may only be used when specific project conditions deem its installation inside the pull box impractical, and only after obtaining the approval of the Turnpike Electrical Engineer.

For poles that are median barrier mounted or pedestal mounted, the light poles must not be provided with frangible bases, strain relief fittings, or breakaway fuseholders.

For poles with (2) luminaires, a single TC cable must be run from the adjacent pull box to the pole's handhole. From the pole's handhole, a pole cable distribution system is required for each luminaire.

### 7.3.2 Design Methodology

*Add the following paragraphs*

A point-by-point, computerized photometric analysis must be performed for all roadway areas being illuminated throughout the project. Photometric data points must be legible. A copy of the results of this analysis must be included in the LDAR and submitted to the Turnpike Electrical Engineer for review. The photometric analysis must identify and evaluate each roadway classification and area of illumination, as defined by the section 7.3.2.1, within the project scope. Each analysis zone must be identified for all distinct area/sections of roadway within the project scope. Some of these distinct areas may include: Mainline, Ramps, and Roadway Directions. Results must indicate foot-candle values displayed on plan view on 11' x 17' pages with 1/100<sup>th</sup> accuracy (0.XX foot-candles). Where solid objects, such as bridges, block light fixture contributions, a 3D graphic representation must be included to ascertain that solids were accounted for. Typical section photometric analysis are not considered a complete or through photometric analysis.

A point-by-point, computerized photometric analysis must be performed for all signs being illuminated throughout the project. A 1 foot by 1 foot maximum point spacing must be used for the point by point photometric for the entire area of the sign panel(s). A copy of the results of this analysis must be included in the LDAR and submitted to the Turnpike Electrical Engineer for review. Results must indicate foot-candle values displayed on each sign panel with 1/100<sup>th</sup> accuracy (0.XX) foot-candles).

A photometric analysis is required for projects where the relocation of light poles is included in the scope of work.

Provide an angle convention detail, if any tilting is required, to clearly depict fixture tilt orientation. A detail is required for each type of fixture being used (fixture on pole, sign luminaire, etc.). The detail(s) must be provided in the LDAR and the plan sheets.

### 7.3.4 Lighting Project Coordination

*Replace the last paragraph with the following*

Per PPM, Vol. 1, 2.10.4 and PPM, Vol. 1, 13.5.1, all projects must be reviewed and coordinated with the FDOT Aviation Office to determine if notification and/or permitting are required to the Federal Aviation Administration (FAA), Florida Department of Transportation (FDOT), and any local jurisdictions.

The Turnpike preferred method of determining FAA notification requirements must be the FAA's Online Notice Criteria Tool at the following link:

<https://oeaaa.faa.gov/oeaaa/external/gisTools/gisAction.jsp?action=showNoNoticeRequiredToolForm>

The Turnpike Project Manager and Turnpike Electrical Engineer must be provided copies of all notifications and permits for review in the Lighting Design Analysis Report. If none are required, written notification must be given to that effect in the Lighting Design Analysis Report.

The airport manager of any possibly affected airport and/or heliport must be contacted and provided project scope, drawings, etc. and be met with to fully coordinate the airspace aspects of the project.

*Add the following paragraph*

**Turnpike ITS and Tolls** – When the locations of light poles are established, they should be checked with the ITS layout and the Toll Equipment layouts for any conflicts with the light poles, the light pole pull boxes, and the roadway lighting circuits.

Modification for Non-Conventional Projects:
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The Roadway Lighting Engineer of Record is responsible for all necessary coordination.
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### 7.3.5 Voltage Drop Criteria

*Replace with the following paragraph*

When determining conductor sizes for lighting branch circuits, the maximum allowable voltage drop must be 6 percent. It must include a combination of both feeder and branch circuit runs from the power company service point to the last luminaire within a circuit.

## 7.4 Traffic Signals

### 7.4.1 Design Criteria

*Add the following paragraph*

The Designer must make every reasonable effort to incorporate the design preferences of the local maintaining agency. These preferences may include but are not limited to pole types, detector loop strategies, conduit routing, specific equipment, signal timing methods, etc. It is the responsibility of the design consultant to meet with the maintaining agency to ascertain their preferences and obtain all other pertinent information. The findings of the design consultant must be reported to the Turnpike's project manager before proceeding with design.

### 7.4.2 Certification and Specialty Items

*Replace the paragraph with the following*

The design of traffic signals compatible with local signal systems may require the use of materials for which there are no Department approved Standard Specifications or Supplemental

Specifications. In those cases, the design consultant will be required to develop project specific Technical Special Provisions (TSPs) for inclusion in the contract document.

### **7.4.11 Traffic Signal Project Coordination**

*Add the following as paragraphs 7, 8 & 9*

In general, the Turnpike will actively work with the local maintaining agencies for coordination of design and maintenance issues.

**Signal Systems** - At the request of the local maintaining agency any signals designed by the Turnpike will include features and equipment typically used for their signals and signal systems. This will include time base, closed loop, UTCS or other technologies. The communications medium must match that already in place.

**Legal Authorization and Maintenance Agreements** - Maintenance Agreements with local maintaining agencies are handled by each FDOT district. New traffic signal locations need to be discussed with Traffic Operations personnel located in the district where they are being installed so that new traffic signals can be included in the overall list they are maintaining.

## **7.5 Intelligent Transportation System (ITS) Components**

### **7.5.2 ITS Device Approval and Compatibility**

*Add the following paragraph*

Equipment requirements must be coordinated at time of final RFP development or specification development with the Florida's Turnpike Traffic Operations Unit to ensure the most appropriate manufactures and models at the time.

### **7.5.4 Motorist Information Systems**

#### **7.5.4.1 Dynamic Message Sign (DMS)**

*Add the following paragraphs*

When general purpose mainline DMS are proposed, a travel time sensor compatible with the existing Vehicle Detection System – Automatic Vehicle Identification (VDS-AVI) System, formerly known as travel time system (TTS), must be installed at the site. Placement of mainline and arterial DMS must be in accordance with the PPM.

Any walk-in DMS proposed on structures collocated with static signage must require a formal approval from the District Traffic Operations Engineer.

New walk-in DMS installed on the mainline must be capable of displaying 18” characters, 21 characters per line, three lines, full color, full matrix messages with 20mm pixel pitch (resolution). Half-span or Full Span supporting truss structure is the preferred mounting style.

Arterial DMS (also known as “ADMS” or “Front Access DMS”) must be capable of displaying 15 characters per line, three lines, full color and full matrix messages with 20mm pixel pitch (resolution). The ADMS are typically mounted on cantilevered structures. The minimum character height must be per FDOT PPM Volume 1, Section 7.5.4.

Toll Plaza Approach DMS (TDMS) must be full-color with 20mm pixel pitch (resolution). TDMS must be located 1-mile to 2-miles from the toll plaza being considered, and must be located to provide adequate perception-reaction distance for the approaching motorists.

Single-line DMS (S-DMS). The Express Lanes status DMS must be capable of displaying 18” characters, 18 characters per line, one line, full color and full matrix messages with 20mm pixel pitch (resolution). For S-DMS provided along arterials, the character height requirement may be reduced to 12”, depending on the arterial speed limit.

Toll Amount DMS (T-DMS). The Express Lanes toll mount DMS must be capable of displaying 18” characters, 7 characters per line, one line, full color and full matrix messages with 20mm pixel pitch (resolution). For T-DMS provided along arterials, the character height requirement may be reduced to 12”, depending on the arterial speed limit. Each **individual toll rate brick on a Toll Amount DMS (T-DMS) panel** must be controlled by one controller, located in ground accessible cabinet. For instance, a standard 3-destination Toll Amount DMS will require three controllers installed in ground accessible cabinet.

For all types of DMS, provide a ground accessible cabinet to install UPS head units and associated battery equipment to meet backup power requirements. Also, transfer switch, auxiliary power and generator connection must be installed. A generator may also be desired; check with Florida’s Turnpike Traffic Operations Unit to see if a separate generator is required. At DMS locations with separate generators (separate from the overall express lanes generator installations) a leveled concrete pad of minimum eight feet (8’) by ten feet (10’) and six-inch (6”) thickness must be installed to support the DMS controller cabinet and generator.

### **7.5.4.2 Highway Advisory Radio**

*Add the following paragraphs*

Existing HAR Transmitter (HART) and HAR Beacon (HARB) locations impacted by project work must be relocated to maintain system effectiveness, in accordance with FCC licensing requirements.

A typical HAR deployment consists of one (1) HART and two (2) HARB signs. One HARB is installed in each direction approaching the HART. A frequency study should be performed prior to locating HARB and HART to ensure adequate signal strength and to limit potential interference of the radio signal between HARB and HART locations, however a practical spacing of 3 miles is recommended between the HART and HARB location to ensure adequate signal strength at the beacon locations.

Coordinate relocations with Central Office Telecommunications, who maintains FCC licensing information for each HART. The Radio Frequency (RF) output is power adjustable up to the FCC maximum of 10 watts, but must be in accordance with the requirements of the FCC License.

The existing and desired radio frequency is established at 1640 AM (1640 KHz), as licensed by the FCC on the Turnpike system.

## **7.5.5 Video Equipment**

### **7.5.5.1 Closed-circuit Television Systems**

*Add the following paragraphs*

Provide IP-addressable CCTV cameras with, Power over Ethernet (PoE) and Built-in encoder utilizing H.264. Provide camera capable of providing 1080p resolution.

Provide a dedicated verification CCTV for every Toll Amount DMS (T-DMS) and every Single-line DMS (S-DMS).

Provide CCTV Poles in accordance with Index 18113.

All new CCTV deployments must utilize a camera lowering device to facilitate maintenance for locations that are difficult to access or where pole heights greater than 45 feet.

### **7.5.5.2 Video Display Systems**

*Add the following paragraph*

Video wall requirements must be coordinated at time of final RFP development or specification development with the Florida Turnpike Traffic Operations Unit to ensure the most appropriate manufactures and models at the time.

## **7.5.6 Network Devices**

*Add the following paragraph*

All device requirements must be coordinated at time of final RFP development or specification development with the Florida's Turnpike Traffic Operations Unit to ensure the most appropriate manufactures and models at the time.

## 7.5.7 Fiber Optic Cable and Interconnect

### 7.5.7.1 Fiber Optic Cable

*Add the following paragraphs*

For new systems, the FOC backbone should utilize 144 single-mode fibers as a minimum (Minimum FOC 144 fibers mainline).

Lateral connections for ITS drops to the backbone must utilize 24 fibers as a minimum.

Label splice enclosure, exiting conduits, and FOC entering the boot with weatherproof laser printed tags (no sharpie or marker). Label patch panels inside of building installations. Use a permanent laser printed tag, waterproof labels, with a printout indicating the department, number of strands, stations upstream and downstream to the next hub. For example:

Department: TP-ITS Strands: 144  
Install Date: 07/07/2013 Project: 420735-1-A  
Current MP: 152.6  
Upstream MP: 153.4  
Downstream MP: 151.9

### 7.5.7.2 Fiber Optic Conduit

*Add the following paragraphs*

The fiber optic conduit system must consist of a minimum of four (4) 1-1/4" conduits. One (1) of the conduits must contain the fiber optic cable (FOC) backbone. One (1) of the conduits must contain tone wire and the other two (2) remaining conduits are spares. The conduits must utilize the colors as described below. In addition, for conduits that require stripes, include three (3) equally spaced longitudinal stripes of sufficient width and color intensity to be easily distinguished.

Orange without stripes (fiber optic cable backbone);  
Orange with white stripes (tone wire);  
Orange with green stripes (spare); and  
Orange with black stripes (spare).

The electrical conduit system must consist of a minimum of one (1) 2" conduit, and must utilize Red colored (without stripes) conduit.

Lateral fiber conduit requirements for ITS must include two (2), 1.25-inch conduits of which one is a spare. The lateral conduits must utilize the following colors:

Orange without stripes (lateral); and  
Orange with white stripe (spare).

### **7.5.7.3 Fiber Optic Splices and Terminations**

*Add the following paragraphs*

Terminate all fibers that enter a structure inside the rack.

Do not locate splice vaults outside of hub buildings; bring the trunk and laterals inside the hub building.

Do not use multimode fiber or copper in any underground backbone or lateral locations.

When the project work necessitates a break in the fiber cable, include provisions regarding allowable downtime. Temporary fusion splices may be used provisioned to temporarily reconnect any broken fibers. Mechanical splices are not permitted. After any temporary splices are added to the system and prior to final acceptance of the project permanent repair and subsequent testing of the ITS fiber optic cable must be completed in accordance with the FDOT Specifications.

Further, permanent repair for fiber optic cable must include replacement of the entire cable from the nearest existing termination point (butt end splice) to the next existing termination point (butt end splice) removing all temporary splices, unless otherwise directed by the Engineer. The butt end splice is defined as a color to color splice of all fibers of the cable. All temporary and permanent splicing must be performed in accordance with the provisions of FDOT Specifications.

Include requirements to submit an ITS repair plan to the Engineer at the pre-construction conference. The plan must outline the procedures, resources and points of contact for a step-by-step guideline in the event the Contractor damages or disrupts normal operation.

Provide detailed plans to the Engineer which show how damage to any ITS facility will be remedied. These details will become part of the as-built plans package. Remediation plans must follow the same guidelines for development and presentation of the as-built plans. In addition, the remediation plans must be approved by the Engineer before any remediation work proceeds.

### **7.5.7.4 Fiber Optic Cable Designating System**

*Add the following paragraphs*

In addition to the Sunshine One Call number (800-432-4770) provided on each route marker, the following contact information must be shown:

1. Florida's Turnpike Enterprise, Traffic Management Center (Orlando) 407-264-3363
2. Florida's Turnpike Enterprise, Traffic Management Center (Pompano) 954-934-1370

The labeling on the Fiber Route Marker must be:

BEFORE DIGGING IN THIS AREA CALL  
Florida's Turnpike Enterprise  
407-264-3363  
954-934-1370  
AND  
SUNSHINE ONE CALL  
1-800-432-4770

### **7.5.7.5 Pull, Splice and Junction Boxes**

*Add the following paragraph*

Provide requirements for splice vault wire management such as non-metallic cable supports to allow the slack cable to be positioned without resting on the ground. The railing system must provide at least 3 inches of separation from the cabling to the bottom of vault. Maintain manufacturers recommended bend radius during and after installation. Provide concrete apron as indicated in the standard index, ensuring appropriate compaction to reduce the possibility of washouts.

The top of pull, splice and junction boxes should be placed at a minimum of 2' above the appropriate drainage feature elevation described in Section 7.1.

All splice boxes must be H-20 or HS-20 load rated with a minimum dimensions of 54"(L)x54"(W)x48"(D).

Any pull box proposed on shoulders or roadways must be H-20 or HS-20 load rated and include a solid bottom with provisions for weep holes and conduit entry. Pull boxes that are proposed outside shoulder/roadway must be Tier 22 load rated.

Pull Boxes and Splice Boxes for fiber optic cable must be labeled and include the words "TPK FIBER OPTIC" permanently cast into their top surface.

Electrical pull boxes must be spaced at a maximum distance of 500 feet for the entire length of new projects.

Electrical Pull Box covers for ITS must include the words "TPK ITS Electric" permanently cast into their top surface.

Pull boxes with low voltage (50V or less) ITS cables must include the words "TPK ITS Composite" permanently cast into their top surface.

## 7.5.8 Infrastructure

*Add the following paragraphs*

Use gel-cap splices to splice electrical wires. No wire nut or electrical tape splicing is acceptable.

Power conduits must have smooth walls and be sized adequately, as determined by the overall cable diameter and recommended percentage of fill of conduit area, per requirements in the latest NEC and FDOT standard specifications, or a minimum of two inches (2") conduits, whichever is larger.

600V step-up electrical systems will not be allowed.

All foundations, cabinets and pull boxes must be coordinated with current and future grading to ensure that the top of the foundations, cabinets and the pull boxes are not below grade.

Maintenance Pads are required at each new ITS component support pole location. These pads must provide adequate clear space for maintenance access and protected from erosion & silt.

Provide a stable, level, and slip resistant concrete pad (tech pad) at all new and existing, affected cabinet locations to allow a technician to stand on comfortably while working on equipment inside the cabinet. The tech pad must, at a minimum, be reinforced to prevent cracking, have a depth of 6 inches, extend 36 inches from the face of each cabinet door, and be 36 inches wide. In addition, provide a leveling platform and railing system to protect from any drop-off hazards described in PPM Figure 8.8.1.

### 7.5.8.2 CCTV Pole and Lowering Device

*Add the following to the first paragraph*

The CCTV camera must be mounted at a minimum of 45 feet above the road, and in some cases may need to be higher to maintain 100% coverage of the roadway.

*Add the following paragraph*

When prestressed concrete poles are specified for ITS Poles, the Design Consultant should provide design and details based on the proposed attachments. Symmetrically placed prestressing should be considered where applicable.

### 7.5.8.4 Equipment Shelter

*Add the following paragraph*

The design layout must include necessary master hub locations to minimize network traffic with an optimum spacing, however, must be supported by a network layout and analysis with appropriate design loss calculations to meet the intent and requirements of this section and all applicable FTE and FDOT standards.

## 7.5.9 Vehicle Detection and Data Collection

*Add the following paragraphs*

In rural areas, MVDS devices must be spaced at 1 mile intervals and co-located with other ITS equipment, like CCTV. For urban areas, the MVDS devices must be spaced at ½ mile intervals. For express lane corridors, MVDS devices must be installed one per direction of travel, and along each direction, the MVDS devices must be located at a maximum spacing of 1/3<sup>rd</sup> mile. must

The MVDS should be installed at CCTV Camera locations to minimize costs, where conflicts between the MVDS and CCTV lower device can be avoided. The use of roadway lighting poles or sign structures for the installation of CCTV cameras and MVDS sites is not allowed.

For travel time data collection, provide VDS-AVI equipment based on Bluetooth technology. VDS-AVI equipment must be installed at each DMS and every interchange, with a maximum spacing at approximately 3 to 5 miles, and in accordance with the manufacturer's requirements.

The designer must provide a Travel Time Origin-Destination and link development submittal. This submittal must be coordinated with the Florida Turnpike Traffic Operations Unit, ensuring adequate link and site design / selection to provide adequate read and matches to provide a reliable travel time. This submittal will clearly identify each VDS-AVI location, message origin & destination, segment length, and anticipated DMS travel time message. In addition, this submittal will identify the links and messages for the FL 511 designation, which will be provided for critical segments from interchange to interchange.

## 7.6 Pavement Markings

*Add the following reference*

*TPPPH Guide Drawings*

*Add the following sections*

## 7.7 Electrical Systems Design and Analysis

The design of all electrical systems (Lighting, Traffic Signals, ITS, etc.) must comply with Florida Administrative Code (FAC) 61G15-33, Responsibility Rules of Professional Engineers Concerning the Design of Electrical Systems. These responsibilities are applicable for all new projects and any major modifications or renovations. The following analysis are required, yet not limited to: Voltage Drop Calculations, Load Analysis and Calculations, Arc Flash Hazard Analysis, and Short Circuit Analysis and Device Coordination. These designs and analyses must be prepared, reviewed, and signed and sealed by a Professional Engineer licensed in the State of Florida. The Professional Engineer must be competent in electrical engineering through training and/or experience. The design analyses must be submitted with each plan submittal as part of the

Lighting Design Analysis Report (LDAR) for lighting projects and the Power Design Analysis Report (PDAR) for ITS projects.

Turnpike preference is for electrical system design analysis to be completed using accepted industry power system analysis software (i.e. ETAP, SKM, etc.). When calculations by hand are used, engineering judgement, assumptions and methods must be clearly explained in the report. All supplemental information used or referenced in the power design analysis must also be provided in the report.

### **7.7.1 Voltage Drop**

Voltage drop calculations must be submitted for all branch circuits and service feeders. Voltage drop calculations must be limited to the percentages shown in the TPPPH and/or TPPPH Guide Drawings. If no criteria exist within the TPPPH and/or TPPPH Guide Drawings, the standards set forth in the FDOT PPM, FDOT Design Standards, and FDOT Standard Specifications for Road and Bridge Construction must be used. If no Turnpike or FDOT criteria exist, the consultant must use the guidelines set forth in the National Electric Code (NEC). Voltage drop calculations must be performed when additional loads are added to existing infrastructure to ensure the proposed conductors are sized appropriately for the total voltage drop resulting from the addition of new loads further from the existing circuits. Formulas, description of variables, and any other supplemental information required to evaluate design results must be included in the report.

### **7.7.2 Load Analysis**

A complete load analysis must be submitted. This analysis must include, but is not limited to: calculation of individual circuits, major distribution equipment, and service points. All calculations must verify all interrupting ratings and conductor sizing.

For any major modifications or renovations, calculations must consist of providing the existing load (prior to modification), the load being removed, the load being added, and new total load. A load analysis must be provided any time electrical load is added to existing infrastructure. All existing loads must be field verified by metering or calculated based on existing conditions.

New service points and major distribution equipment must be provided with a minimum of 20-percent spare capacity.

Manufacturer's product data cut sheets containing equipment power requirements must be provided in the report. Generator sizing calculations, UPS sizing calculations, and any other calculations affected by power loads for the project must be provided in the report.

### **7.7.3 Arc Flash Hazard Analysis**

Provide an Arc Flash Hazard Analysis for new electrical distribution equipment (panelboards, transformers, load centers, disconnects, etc.), per the latest version of the Standard for Electrical Safety in the Workplace, NFPA 70E. An arc flash hazard analysis must determine the Arc Flash Protection Boundary and the personal protective equipment (PPE) that personnel within the Arc Flash Boundary must use. The arc flash hazard analysis must be updated when a major modification or renovation takes place. Arc Flash and Shock Warning labels must be field installed on each piece of new electrical distribution equipment. The labels will indicate the flash hazard boundary, the flash hazard at 18 inches, the PPE level requirements, and the approach restrictions. All labels proposed for use on electrical equipment must be provided (in .pdf format) as part of the report and in the plans.

### **7.7.4 Short Circuit Analysis and Device Coordination**

A short circuit analysis must determine maximum fault current on each piece of new electrical distribution equipment and proper fault current interrupting capacity. Provide documentation from the utility provider on the maximum available fault current at the utility transformer. This value must be used in the short circuit analysis. Software programs or hand methods used must be capable of calculating the maximum short circuits at all electrical equipment locations to ensure equipment ratings are adequate. The short circuit analysis must be updated when a major modification or renovation takes place or if electrical load is added to existing infrastructure. The AIC ratings for all equipment must be provided as part of the contract documents to meet or exceed the short circuit analysis results.

Electrical distribution equipment must be designed as fully rated and selectively coordinated systems. The protective features of the electrical distribution system must automatically and selectively isolate a faulted or overloaded circuit from the remainder of the electrical system. Only the closest protective device to the fault must operate to isolate the fault without affecting other parts of the system.

## Chapter 8

### Pedestrian, Bicycle and Public Transit Facilities

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

#### 8.7 Bridges, Overpasses, and Underpasses

##### 8.7.1 Design Criteria

*Add the following paragraph*

###### 6. Railing and Fencing

- h. Provide enclosed bridge fencing in conformance with Standard Index drawings on pedestrian bridges and vehicular bridges with pedestrian facilities crossing Turnpike right of way or railroad. Unless otherwise approved, fencing must extend the full length of the bridge including approach slabs.

## Chapter 9

### Landscape and Community Aesthetic Features

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

#### 9.1 General

*Add the following paragraph*

All FTE landscape designs must comply with the “Florida Turnpike Enterprise Landscape BRAND Guidelines” most current issue. This document can be found at:

<http://floridasturnpike.com/design/docsandpubs.html>

#### 9.1.1 References

*Add the following reference*

20. Florida Grades and Standards for Nursery Plants, Current Edition, Florida Department of Agriculture and Consumer Services, Division of Plant Industry.

## Chapter 10

### Transportation Management Plan

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

#### 10.2 References

*Add the following reference*

9. FDOT, Drainage Manual

#### 10.3 Transportation Management Plan (TMP)

*Add to 4<sup>th</sup> paragraph representatives list*

Insert new additional #11. Florida Highway Patrol and Emergency Responders

##### 10.3.1 Transportation Management Plan Components

###### 10.3.1.1 Temporary Traffic Control (TTC) Plans

*Add the following sentence to item 9*

9. Consideration must take into account all affected lanes, i.e., mainline, auxiliary lanes, acceleration/deceleration, ramps, etc.

*Add to item 6*

6. "... Temporary signals, roadway CCTVs, and video detection sites."

*Add new/additional items*

22. Emergency responder access to maintained travel lanes within work zone and to work area.
23. Communication plan to coordinate with Turnpike Traffic Management Center (TMC) for real-time work zone and lane closure activities.
24. Address Emergency Stopping Sites (ESS)/Accident Investigation Sites (AIS) for motorists and responders within the work zone.

*Add the following paragraphs*

Project specific conditions associated with milling and resurfacing require the designer to develop project specific notes for the plans. Generally these notes are part of the TCP.

It is the Turnpike's policy **not** to allow ponding conditions during the milling and resurfacing. The Traffic Control Plan may require alternate stages/notes within a milling and resurfacing phase to meet this requirement.

The plan may require the contractor to alternate stages or pave multiple lifts during the same work period to comply with ponding avoidance and drop off restrictions.

It is the designer's responsibility to evaluate his/her plans and to incorporate notes or phasing such that the contractor clearly understands the conditions associated with milling and resurfacing in order to adhere to the Turnpike's policy.

**10.3.1.1.1 TTC Plan Development***Add the following as bullets to the end of Step #2*

10. Maintain drainage conveyance and spread.
11. Maintaining traffic at interchange locations, ie. need for auxiliary lane(s), lengths of acceleration and deceleration lane(s).

*Add the following as bullet #13 and 14 to end of Step #6*

13. a. Turnpike TMC communication and coordination for real-time activities.
14. Detail temporary drainage and maintenance of offsite drainage plans.

*Add the following as bullets to end of Step #6*

- F. Staged wreckers or tow vehicles
- G. Emergency Stopping Sites (ESS) or Accident Investigation Sites (AIS)

**10.3.1.2 Transportation Operations***Add 2 boxes to Strategies table to include:*

Under Safety Management and Enforcement column:

“Specialty tow or flatbed wreckers, incident response trucks (IRT)”

“Emergency Access, Emergency Stopping Sites, Glare Screens”

**10.4 Coordination***Add the following paragraphs*

Refer to TPPPH Volume 1, section 16.2.6.1, for specific coordination and preliminary traffic control plan requirements.

TTC plans must also include requirements for real-time communication and coordination with Turnpike TMC for active work zone and lane closure activities.

## 10.6 TTC Devices

*Replace #8 with the following*

8. Motorist Awareness System (MAS) and Turnpike TMC real-time coordination

## 10.7 Signs

*Add the following paragraph*

The Designer must prepare details for nonstandard TTC signs that do not have a standard MUTCD or FTP number. Provide the details on guide sign worksheets in the plans.

### 10.7.3 Project Information Sign

*Replace with the following paragraph*

Project Information Signs and Toll Dollars At Work Signs are required for all projects with more than 90 days of contract time. Placement of the Project Information Sign and Toll Dollars At Work Sign must be in advance of the first advance warning sign or as close to the beginning of the project as practice on each mainline approach. Ensure proper sign spacing criteria is maintained as described in section 7.2.1. The Project Information Sign must precede the Toll Dollars At Work Sign. See Index 600 and the Guide Drawings for sign layout details.

## 10.8 Lighted Units

### 10.8.2 Portable Changeable Message Signs

*Add sentence to end of paragraph 1*

Use of remotely programmable PCMS should be considered as needed. These PCMS could be activated and changed in real-time by TMC for better work zone management.

*Add the following paragraph*

For planned lane closures and detours, a portable changeable message sign must be placed and must display an advanced notification message one week prior to lane closure or detour. The EOR may extend this time if they deem necessary, but should not extend 14 calendar days. The message must include the month and day(s) of the implementation of the closure or detour. Prior to closure, the message must read location "TO CLOSE" with the date. During the closure the message must read the location is "CLOSED".

## 10.10 Pavement Markings

*Add the following paragraph*

All proposed, temporary, or pavement markings to be removed must be detailed completely in the plans for a proper layout. This includes either dimensions to physical features or stations and offsets.

### 10.10.1 Removing Pavement Markings

*Add the following paragraphs*

The Turnpike is advising all consultants that overlays or milling with overlays will be the only acceptable method(s) to achieve a positive means for the obliteration of existing pavement markings in areas such as long term crossovers, diversions and in some cases tangent sections that provide a rough riding pavement.

High pressure water blasting is the only acceptable method for the removal of conflicting pavement markings in those areas not mentioned above. When removing pavement messages via water blasting, the entire area within the pavement message, including the interior of the message that is not painted or have thermoplastic, must be water blasted so that the message outline is completely obliterated and drivers are not able to read or see the scar outlining the former message.

## 10.12 Temporary Traffic Control Plan Details

*Add the following as bullet #11*

11. Temporary pavement and drainage maintenance details.

### 10.12.5 Superelevation

*Add the following paragraphs*

The transition from existing to temporary pavements is a critical area. These areas are prone to flooding since all of the permanent construction features do not exist. These incomplete features include final pavement elevations and drainage facilities. Frequently, these temporary pavement transitions are superelevated with almost flat profiles. Elevations and grades with all superelevation data are required to be shown to ensure the intended design is constructed.

On Turnpike Facilities, diversions with construction speeds of 50 mph or greater are considered high speed facilities. Curvature and superelevation criteria for open highway conditions apply and must meet superelevation criteria described in the PPM Volume 1, Chapter 2.9.

### 10.12.6 Lane Widths

*Add the following paragraphs*

Shoulder widths associated with the travel lanes must be designed to achieve a minimum of two feet in width (paved). Spread must be checked to verify that the provided shoulder width complies

with the criteria in Chapter 3.9.1 of the Drainage Manual. Any deviation from the two feet must be justified to and approved by the Turnpike Design Engineer.

Milling and resurfacing of Turnpike's facilities must utilize a minimum offset of four feet from Turnpike Traffic and the milling operation or the resurfacing operation. Where a four feet shoulder (buffer) cannot be maintained, an acceptable buffer space must be approved by the Turnpike Design Engineer.

*Add the following sentence*

Consideration should also be given to maintain the maximum shoulder width up to 12-feet whenever possible to benefit motorists and for use by law enforcement and emergency responders for incident management.

*Add the following section*

### **10.12.6.1 Emergency Pull Off Area**

All capacity improvement (widening, reconstruction, etc.) or interchange projects that are greater than one mile in length along the mainline, and reduce the outside mainline shoulder width less than eight feet wide, must include provisions for an emergency pull off area. The emergency pull off area must be located to the right of the outside travel lane for use by patrons and emergency management personnel. The emergency pull off area must be a minimum of twelve feet wide and 500 feet long located every one-half to one mile and no closer than one-half mile from an interchange. The emergency pull off area must maintain the adjacent lane or paved shoulder cross slope and be paved with chevron pavement markings at 60 foot spacing. The emergency pull off area must not be designated as an ingress/egress location for the contractor.

### **10.12.7 Lane Closure Analysis**

*Add the following paragraphs*

Closing a traffic lane on Interstate or Limited Access facilities can have a significant operational impact in terms of reduced capacity and delay. Operational impact can occur when lane closure(s) of any of the following occur; mainline, interchange ramp(s), auxiliary lane(s), acceleration or deceleration lane(s). There will be no daytime lane closures allowed on Florida's Turnpike unless it is approved in writing by the Director of Transportation Operations or designee even though the lane closure analysis may support a daytime closure, approval must be obtained. Other districts have adopted similar policy for Interstate daytime lane closures; therefore, it is recommended the Designer verify the District's lane closure policy at the beginning of the design process.

The Turnpike System is a major intrastate facility that is vital in the case of evacuations due to weather and other disasters. The Turnpike also serves as a diversion route for various Interstates, including I-95 and I-4. It is essential that the Turnpike be able to reopen its facilities to all lanes even within construction zones. The development of a traffic control plan must not include prolonged lane reductions on mainline, ramps, auxiliary lanes, etc. The staging of a particular construction project must permit the roadway to be restored to its original number of lanes within

24 hours. If necessary the use of temporary bridges must be included in the traffic control plans to avoid prolonged lane closures due to work on the bridge.

Turnpike lane closure traffic data must be obtained from Turnpike Traffic and Planning Departments including a growth rate factor and peak seasonal factor for all production design projects. See Florida's Turnpike Lane Closure Policy for additional information and guidance. The design consultant will be responsible for developing analysis for both the begin construction year and the end construction year for projects twenty-four months and longer. Lane closure analyses are to be submitted for review in electronic format and include traffic data as attachment for reference. If a detour and/or a prolonged closure is proposed on a project, the lane closure analysis must also include traffic analysis of the affected ramps. In terms of prolonged closure, include analysis and effect of closure(s) on the capacity and operations at the interchange. Once reviewed and approval is provided, a signed and sealed Lane Closure Analysis will be requested by Project Manager for filing in the project folder.

Daytime closures will be considered/allowed if the EOR for the design makes a recommendation to the Project Manager that a closure is more beneficial to the Turnpike, its customers and adjacent property owners. For example, driving guardrail posts at night adjacent to homes is not as desirable as daytime closures which would support the work during the day and minimize the noise pollution and complaints from the adjacent property owners. The EOR for the design will be required to provide all supporting documentation including, but not limited to, lane closure analysis and the specific reasons why the request is being made to the Project Manager. On certain projects, daytime lane closures may not be applicable throughout the entire project. This aspect has to be considered by the EOR for the design when making his recommendation. The EOR for the design must evaluate adjacent projects for their closure hours and provide that information along with their analysis and recommendation.

In addition to daytime lane closures, Florida's Turnpike prohibits lane closures from sunup Friday until sundown Sunday (weekend). Weekend lane closures will also be considered/allowed if the EOR for the design makes a recommendation to the Project Manager that a closure is more beneficial to the Turnpike, its customers and adjacent property owners. A weekend lane closure request must follow the same process as a daytime lane closure request.

*Add the following section*

### **10.12.7.1 Requesting Deviations from the Lane Closure Policy**

Deviations from the Turnpike Lane Closure Policy are highly discouraged and should only be considered when all other alternatives are deemed impossible, impractical, or unsafe. Deviations must be requested with the necessary justification in accordance with the Turnpike Lane Closure

Policy. A Technical Memorandum must be prepared and approved as soon as possible in the design and no later than Phase III. The Technical Memorandum must contain at a minimum:

- 1.) Project Description
- 2.) Design Criteria
- 3.) Proposed Criteria
- 4.) Justification
  - a. Summarize Lane Closure Analysis
  - b. Evaluate 5-Year Crash Data (Including Time of Day Analysis)
  - c. Alternatives Considered
    - i. Explain why these alternatives are impractical, impossible, or unsafe.
    - ii. Include rough cost, impacts to right of way, environment, community, operations, etc.
- 5.) Summary Conclusions
- 6.) Appendices
  - a. All necessary supporting documentation

A coordination meeting with Turnpike Traffic Operations, Roadway, and Construction is required prior to requesting the deviation which can be done as part of the 45% MOT meeting and no later than Phase II.

*Add the following section*

### **10.12.7.2 Exit Ramp Opening**

Work in the vicinity of an exit ramp must follow the latest MUTCD requirements with the following modification:

1. Minimum Ramp Opening of 200 feet.

### **10.12.8 Traffic Pacing Design**

*Add language to last sentence*

“... the Florida Highway Patrol troop who will assist in the operation, and communicate and coordinate with the Turnpike TMC for pre-notice and real-time implementation. Coordination with TMC will allow real-time traveler information use of dynamic message signs, highway advisory radios and citizen band advisory system and statewide Florida 511 system.”

*Add the following paragraphs*

*Index 655* also includes a design table applicable to most work times of 20 minutes or less. The table is based on a pacing speed of 20 mph. Slower pacing speeds are not recommended but can be selected by the designer when necessary to shorten the pacing distance. See section IV Traffic Pacing of the Florida’s Turnpike Enterprise Lane Closure Policy for additional guidelines on Traffic Pacing.

Site specific conditions will dictate whether a pacing operation can be implemented; therefore, it is necessary that the designer coordinate with Florida's Turnpike Enterprise at the time the Traffic Control Plan is being developed. The type of work will determine the construction equipment and required staging areas the contractor will need, particularly for placing bridge beams. Review of these issues with Florida's Turnpike Enterprise will determine if lane closures will need to be used along with the pacing operation, or if the traffic will have to be detoured instead of paced. If it is determined that a pacing operation will be used, the designer must obtain concurrence from the Captain of the Florida Highway Patrol troop (Troop K) who will assist in the operation.

*Exhibit 10-C, sheets 5 - 12* will not be applicable. See Florida's Turnpike Enterprise Lane Closure Policy for allowable hours of Traffic Pacing. The Lane Closure Policy can be found at the following link:

<http://floridasturnpike.com/design/docsandpubs.html>

### **10.12.12 Narrow Bridges and Roadways**

*Add the following paragraph*

In the development of the detailed traffic control plan, any existing guardrail and barrier wall end treatments must be compared with standards to ensure the current standards are met. If the traffic control plan impacts these end treatments, then protective device upgrades will be necessary.

### **10.12.13 Existing Highway Lighting**

*Replace the first paragraph with the following*

Temporary lighting systems are required for all roadways where existing lighting is being replaced or new lighting is being constructed. The designer must prepare a specification that completely describes what is to be done during all phases of construction. Give detailed information on poles, conduit, and/or conductors that would have to be installed. A field survey must be conducted to establish the condition of any existing system(s) and what responsibility the contractor will have in bringing the existing lighting system(s) back to an acceptable condition.

*Add the following section*

### **10.12.18 Temporary Drainage**

The Designer is responsible for designing the temporary drainage facilities necessary during construction. This includes designing temporary ditches, the size and length of pipes, placement of inlets and where necessary calculating spread where water may pool along temporary barrier wall or curbing adjacent to an inside lane. All temporary drainage items must be shown in the plans and quantified.

*Add the following section*

### **10.12.19 Friction Course on Temporary Pavement**

New structural asphalt has similar friction factors as friction course. The use of friction course asphalt on temporary pavement during construction will be used on a case by case basis and consider the duration of the construction phase, drainage, cross slope, operating speed and horizontal curvature.

*Add the following section*

### **10.12.20 Reflective Pavement Markers**

Reflective Pavement Markers (RPM) used to delineate traffic control lane lines must be installed in conjunction with lane stripes. The use of RMP's independent of pavement stripes must be approved by the Turnpike Design Engineer.

*Add the following section*

### **10.12.21 Standard MOT General Notes**

See Roadway Guide Drawings for standard MOT General Notes that must be shown on traffic control plans as applicable. Roadway Guide Drawings are at the following link on the Turnpike Design Website:

<http://floridasturnpike.com/design/tppph.html>

## **10.13 Speed Zoning**

### **10.13.1 Regulatory Speeds in Work Zones**

*Add the following paragraph*

All transitions and tapers for work zones must be based upon the preconstruction speed limits. For any locations incorporating speed reductions, speed limit signs must be installed departing the work zone to "restore" the speed limit to its preconstruction limit. During non-construction periods the speed limits must be restored to preconstruction limits.

## 10.14 Law Enforcement Services

### 10.14.2 Use of Traffic Control Officer

*Add the following paragraphs*

All lane and ramp closures on a FTE mainline facility require the use of Traffic Control Officers for the duration of the closure. The designer needs to coordinate the use of additional Traffic Control Officers with FTE Construction at the preliminary TCP submittal, or at a minimum, prior to the Phase II submittal. This must be an item of discussion at the 45% Traffic Control Meeting.

The locations and/or need for additional traffic control, must be outside of the four conditions called out in the Specification 102-7 and must be brought to the Turnpike's attention by memo identifying the additional locations and the corresponding considerations of a safety issue to the motorist and workers.

A matrix indicating the estimated hours for traffic control must be developed and provided to FTE Construction during coordination of law enforcement personnel. Coordination with FTE Construction must include discussion on placement of the matrix within the plans and/or the Computation Book.

<b>FHP TRAFFIC CONTROL OFFICER ESTIMATE</b>				
Direction/Phase	Number Work Periods	Hours/Work Period	No. Troopers Required	Total FHP Hours
NB Phase I	2	8	1	16
NB Phase II	2	8	1	16
SB Phase I	2	8	1	16
SB Phase II	2	8	1	16
Total FHP				64

This matrix is *an example* and must be modified as required for each project.

Upon concurrence with the designer's recommendation for the use of additional traffic control officers on the project, review MOT General Notes and incorporate in plans the applicable traffic control officer notes and Regional contact information:

<http://floridasturnpike.com/design/tppph.html>

## **10.15 Motorist Awareness System (MAS)**

*Add sentence to end of 2nd paragraph*

Required real-time communication and coordination with Turnpike TMC for traveler information device usage should be utilized. Dynamic message signs and other traveler information devices can be used by TMC for motorist information.

*Add the following paragraph*

All lane and ramp closures on an FTE mainline facility require the use of Index 670 – Motorist Awareness System.

## **Chapter 11**

### **Stormwater Pollution Prevention Plan**

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

*No changes to the entire chapter*

## Chapter 12

### Right of Way

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

#### 12.1 General

*Add the following definition to the end of section*

**Non-monetary Benefit** is when an attorney represents a property owner, and the attorney secures a benefit for his client such as improved access, drainage or a re-design. When this benefit can be quantified in dollars, the attorney may add the value of this benefit to the acquisition price of the property when determining his statutory fee, which is based on the benefit achieved.

#### 12.2 Procedures for Establishing Right of Way Requirements

##### 12.2.3 Access Management

*Add at end of paragraph 1*

Access management criteria often affect the access to property after construction. These criteria should be discussed during the field review to lessen potential impacts

*Add the following section*

#### 12.4 Property Owner Contacts

All property owners should be contacted and given notice prior to entering their property for any reason. In many cases the design consultant's survey crew makes the first contact with an owner. The Department has received complaints from owners where survey crews were on the property unbeknownst to the owner. In some cases, school age children were home alone; in others, the crews were disturbing livestock or cutting trees. When contacted, the company's response has been "we have the legal right to be there". While true, the Turnpike expects a more diplomatic and sensitive approach. A bad experience on the part of the property owner early in the process can sour the whole acquisition process.

Property owners often contact project managers by phone or at public hearings. There is a tendency to try to accommodate the needs of an owner, which can lead the property owner to believe they have a commitment from the Department. This is especially true with the initial design, access, and drainage. The Engineer/Surveyor should avoid conjecture and speculating on possible changes to avoid misunderstanding. The Turnpike Right of Way Office will be the point of contact with the property owner to discuss right of way impacts to the property. The

Turnpike Right of Way Office and Turnpike Project Manager should receive copies of any responses sent to property owners.

Throughout the life of a project, the project manager should refer any contact by the property owner to the right of way project manager. Concessions made to a property owner may result in a non-monetary benefit to the owner's attorney. Right of way should be included in all discussions when a design change affects the land required or access to adjoining property.

*Add the following section*

## **12.5 Construction Issues**

Fencing and encroachments are two issues that are repeated concerns upon letting a project to construction. The Department routinely pays for fencing in the right of way and for replacement fencing as a “cost to cure.” However, the property owner does not have to implement a “cost to cure” and therefore the contractor often finds a fence in place during clearing and grubbing. Construction may be concerned that if they take the fence down they will incur some liability for damages, like cattle roaming free or trespassing.

Right of Way routinely notifies the property owner in writing that a fence will be removed by construction and that the owner is responsible for replacing the fence. Often though, the owner's inaction requires the Department's legal staff to contact the owner's attorney to get the new fence erected. Providing for temporary fencing in the construction contract can help avoid any delays caused by fencing.

Other encroachments such as mailboxes and signs are found from time to time and the Property Management Office in Right of Way is charged with facilitating their removal.

## Chapter 13

### Initial Engineering Design Process

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

#### 13.2 Initial Engineering Design (Phase I)

*Add the following items*

12. Identify seasonal high water and base clearance water elevations and determine base clearance (PPM, Chapter 2).
13. Identify applicable project drainage criteria and constraints. Determine impacts to project design and schedule.

#### 13.5 Support Services

*Add the following items*

21. Toll Operations
22. Environmental Permitting
23. ITS
24. Lighting/Electrical
25. Concepts
26. Architecture
27. Materials (pavement)

#### 13.6 Preliminary Geometry, Grades, and Cross Sections

*Add the following sentence at the end of 3<sup>rd</sup> paragraph*

Refer to TPPPH Volume 1, Section 16.2.5.1, for specific submittal and coordination requirements of the preliminary line and grade.

## **Chapter 14**

### **Final Engineering Design Process**

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

*No changes to the entire chapter*

## **Chapter 15**

### **Update Engineering Design Process**

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

*No changes to the entire chapter*

## Chapter 16

### Design Submittals

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

#### 16.2 Design Documentation Submittals

*Add the following paragraph*

All documents requiring Turnpike approval/concurrence must submit the draft, pre-final, and final versions to the Turnpike Project Manager for review through the ERC process. Once the ERC process is complete, the Turnpike Project Manager can proceed with obtaining the necessary approvals/concurrence.

#### 16.2.3 Typical Section Package

*Add the following before paragraph 1*

All Typical Section Packages must include a Signature Sheet that will be located directly behind the location map and include an index of sheets and contain all necessary signatures for the package. This will allow Signatories to sign/seal one sheet as opposed to every sheet and facilitate the use of digital signatures. If District, County, or other signatories are required, those sheets will be listed separately on the Signature Sheet.

An example Signature Sheet can be found on the Turnpike Design Website:

<http://floridasturnpike.com/design/disciplines/roadway.html>

*Add items e. and f. to Bullet #1 “Are required if:”*

- e. There are realigned local roads, frontage roads, cul-de-sacs, railroads, canals, aerial transmission lines, etc. as applicable.
- f. There are proposed toll gantries. Typical section must be at the toll gantry structure and be representative of the 100' tolling pavement area.

*Add the following after paragraph 3*

When cross roads or other facilities are maintained by another agency, they must sign and date their approval on the typical section 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 typical sections to meet higher FDOT or Turnpike criteria.)

***Add to Bullet #7 (Traffic Data) “Project Controls Sheet”***

7. Traffic Data – Truck DDHV

***Add to list for “Proposed Roadway Typical Section Drawing”***

17. Express lane buffer widths with express lane markers (when applicable)
18. Future lane widths (types and locations).
19. Clear zone.
20. Vertical and Horizontal Clearances at crossing roads if project includes work within bridge limits.
21. 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.
22. Denote elements that require a design exception/variation.
23. Toll equipment building and gantry outlines (when applicable).

If major changes will be made after initial construction, a separate future typical section drawing must be prepared. Future lanes on proposed crossroad typical sections must be dashed and labeled "Future, By Others". Future typical sections 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.
16. Express lane buffer width with express lane markers (when applicable).

***Add the following section***

### **16.2.3.1 FTE Processing**

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 used for stormwater ponds 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 must submit preliminary (approximately 15 percent) alignment and grade sketches/computer plots depicting the proposed geometric design. The submittal must include horizontal geometry for all mainline roadways, ramps, cross streets and side roads. As a minimum, vertical geometry must 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 must be shown in profile view.

Supporting calculations/computer printouts must also be submitted. Specific elements which must 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 must 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) must be submitted for review. A comment resolution meeting between the design consultant and FTE production and Construction staff must be scheduled following the review.

Deviations from Turnpike's Lane Closure Policy or from the TPPPH Chapter 10 are to be identified and requested via a Technical Memorandum as part of the 45% submittal. Approval as indicated in the Turnpike's Lane Closure Policy must be obtained prior to the Phase II submittal.

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 must be on Roll Plots, in electronic format, and must 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 must 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 Turnpike Design Engineer.

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

10. All Pavement designs through Tolling Gantries must meet the minimum pavement designs listed in the General Tolling Requirements (GTR), latest edition. If necessary the pavement thickness must be increased from the GTR minimums in order to provide the required pavement structural number.

Upon acceptance by FTE staff, submit the signed and sealed Pavement Design Reports. The Turnpike Roadway Engineer will forward the report to the Turnpike Design Engineer for concurrence and signature. A signed copy will be returned to the consultant.

To simplify and reduce the effort and time in processing the pavement designs, the Engineer of Record must digitally sign and seal the cover page of the Pavement Design Report and provide a concurrence signature block for the Turnpike Design Engineer's approval. This eliminates the need for the Engineers to approve the pavement designs individually.

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://floridasturnpike.com/design/disciplines/roadway.html>

*Add the following section*

### **16.2.7.2 Cross Slope Analysis Report – Design**

Cross Slope Analysis on designated RRR projects must use the cross slope ranges defined in Section 25.4.6 of PPM Volume 1. All non-designated RRR projects require new construction criteria and must use the cross slope tolerances for new construction cross slopes as defined by Specification 330-9 available at the following link:

<http://www.dot.state.fl.us/programmanagement/Implemented/SpecBooks/default.shtm>

Existing cross-slopes must be analyzed by averaging the cross slope on a sliding scale and comparing the average cross slope against the appropriate tolerances. For practical construction purposes, Turnpike generally uses 1000' on tangent and 500' through horizontal curves as the minimum sliding scale lengths. However, the engineer may increase or decrease these lengths based on project specific warrants. A separate cross slope analysis report must be submitted concurrently with the project pavement design and approved prior to the Phase II project submittal.

**Modification for Non-Conventional Projects:**

*Delete the last two sentences above and replace with the following*

A separate cross slope analysis report must be submitted concurrently with the project pavement design and approved prior to the Phase III project submittal.

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 must be shown in the plans, with a preference to show milling at specific cross slopes between stations from a single constant depth control point for at least 1000' through tangent sections and 500' through horizontal curves, followed by constant depth resurfacing. This approach minimizes the amount of the data shown in tabular format.

For all projects, the approach to cross slope correction described above is required unless otherwise approved by the Turnpike Roadway Engineer.

*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 or Specification 330-9 as applicable.

*Add the following section*

### **16.2.9 Roadway Design Documentation**

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

**I. Section 1 – Summary**

- A. Narrative
  - a. Summary of existing and proposed design
- B. Design Decision Journal
  - a. Document design decisions for all disciplines both internal and external in tabular format
  - b. Include Identification Number, Date, Author, Discipline, Subject, Decision, and an Explanation

**II. Section 2 – Design Documentation**

- A. Location Map
- B. Roadway Design Criteria (PPM, TPPPH, & AASHTO in tabular format)
- C. Horizontal and Vertical Alignments (GEOPAK Output)
- D. Design Calculations & Exhibits (Existing, Proposed, and Temporary Conditions)
  - a. Superelevation
  - b. Horizontal and Vertical Stopping Sight Distance
  - c. Vertical Clearance
  - d. Barrier – Length of Need
  - e. AutoTURN Analysis
  - f. Intersection Sight Distance Analysis
  - g. Cross Slope & Superelevation Analysis
- E. MOT
  - a. Lane Closure Analysis (Final Signed and Sealed)
  - b. Pacing Analysis
  - c. Detour Analysis
  - d. Impacts to Toll Facilities
- F. Typical Section Package (Final Signed and Sealed)
- G. Pavement Design Report (Final Signed and Sealed)
- H. Design Variations/Exceptions (Final Signed and Sealed)
- I. Summary of 5-Year Crash Data
- J. Existing Roadway Conditions Assessment Report (ERCAR)
- K. Meeting Minutes/Project Correspondence (Related to Roadway Elements)
- L. Comments and Responses (Related to Roadway Elements)

The design documentation must 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 must 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 must be submitted electronically to the FTE Project Manager.

## Chapter 17

### Engineering Design Estimate Process

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

#### 17.6 Alternative Contracting Practices

*Add the following sentence*

The Project Manager must obtain, from the construction office, recommendations for Alternative Contracting Practices.

## Chapter 18

### Quality Assurance and Quality Control

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

*Add the following sections*

#### 18.4 Turnpike Quality Control and Assurance Process

##### 18.4.1 Quality Goals and General Requirements

The Turnpike's definition of Quality is "**Conformance to Requirements**". The Turnpike's primary quality goal is that construction documents and reports be complete, orderly, correct, and appropriate for the intended purposes, so that they do not impose potential liability, or require supplemental agreements that increase construction time or cost, or require an inappropriate review effort on the part of the Turnpike. The preparation of the work must meet or exceed normal, legally acceptable, "**Due Diligence**" ("**Due or Ordinary Care**") requirements that have been established by the following criteria, the standard of practice generally provided on Turnpike work.

The following is the general quality control and assurance process criteria that is required by each project Scope of Services, including - initiation, production, review and audit procedures.

1. Designate the appropriate project staffing for each element of the work in the Project Staffing List form included at the end of this section. Also provide the required organization, planning, scheduling and project initiation. If the work produced is to comply with the quality requirements and goals, it will be imperative that the work **be prepared and checked by qualified professionals that know the Department and Project requirements**, and that they use and document the "Due or Ordinary Care" production and review quality control and assurance requirements stipulated in the Standard Project Scope of Services performance criteria. Designated Project Team personnel include - the qualified Responsible Professionals and associated project staff to produce the work, and Reviewers with professional qualifications necessary to be the Responsible Professional to review and confirm that the work is accurate and complete. Also, Reviewers must be independent of activities that take place during design and plans production for the Project.
2. Focus on the prevention of rework and production errors by the use of quality oriented Responsible Professionals and production procedures (including self and documented Responsible Professional checking) to produce high quality work. Production quality is achieved through the careful development of the work and the continuous checking,

- concurrence (back checking) and verification of changes on all work and documents during their preparation and review.
3. Provide and document the required Coordination, Field and Biddability Reviews as provided in the Scope of Services to prevent production rework, errors and omissions.
  4. Support Value Engineering Studies and provide special supplemental Independent Peer, Constructability, and/or Maintainability Reviews on designated projects.
  5. Provide and document, as required, the Submittal and Biddability Reviews by qualified and experienced Reviewers to confirm that the work produced is appropriate, complete, and correct. As a minimum, checking must be required for each document before it is used for further development or before a required Phase Submittal.
  6. Utilize a standard check and back check procedure that meets the Standard Project Scope of Services performance criteria to document the thoroughness of the checking and review process and to provide the documentation of the agreement between two qualified (licensed if required) professionals in a given field that the work produced and reviewed conforms to all requirements, is appropriate, complete, accurate and correct. The checking process must take place in accordance with the requirements of the Scope of Services and the established project schedule.
  7. Utilize Submittal Sufficiency and Quality Assurance Reviews to confirm completion and validate each submittal Certificate of Compliance.
  8. The Standard Project Scope of Services performance criteria require that a Standard Check and Back Checking Procedure must be used to document all checking and reviews. Project production and review team members must also utilize the Completion Checklists, Quality Control Tracking Stamp and Quality Process Logs, (blank copy included at the end of this Chapter), to document the production and review checking of all work. Project production and review quality control procedures are to be performed in compliance with the Scope of Services.
  9. The Standard Project Scope of Services performance criteria requires that the review documentation, which is developed during the production and review of the work, must be retained in the project files, according to requirements of the Scope of Services, for Quality Assurance Review and audit purposes, and to demonstrate that the Project quality control requirements have been met.
  10. If, under some extenuating circumstance an information printout or document must be sent to the Turnpike before the required Submittal Review has been performed, this procedure is to be followed:
    - a. The Principal or Officer-In-Charge approves the release of the documents.
    - b. The documents are stamped "Advance Copy - For Information Only".

- c. The Turnpike is notified in the transmittal letter that the Submittal Review process has not been completed on the documents and that the Turnpike personnel should not review the documents until the Project Quality Control Process is complete.
11. The Turnpike will provide Compliance Reviews, Biddability Audits, PM Monitoring, and Quality Process Audits to complete the process.
12. The process required forms - Quality Control Tracking Stamp, Project Staffing List, Quality Process Log, Certificate of Compliance and Certification of Plans, Specifications and Quantities are located at the end of this chapter. A Sample Project Quality Control Plan that meets the requirements of the Standard Project Scope of Services performance criteria is available through Turnpike Project Managers.
13. Definitions of terms utilized in the Standard Project Scope of Services performance criteria and explanations of these requirements are included in the following section.

<b>Modification for Non-Conventional Project:</b>
---

All reviews and processes described within this chapter are required to be implemented and documented in the Quality Management Plan for all non-conventional projects.
---

## **18.4.2 Quality Control Procedure Requirements**

### **18.4.2.1 Completion Checklists Requirements**

The Standard Project Scope of Services performance criteria requires that the Design Consultant use appropriate Completion Checklists to document the thoroughness of their Production Review efforts and to reduce rework on each work element. Design Consultant will include copies of their Completion Checklists as an appendix to their Project Quality Control Plan.

### **18.4.2.2 Quality Control Tracking Stamp Requirements**

The Standard Project Scope of Services performance criteria requires that the Design Consultant use the standard Quality Control Tracking Stamp or an equivalent CADD cell, with an acceptable version of the production certification shown in the stamp below, to document and track the completion of the check and back check procedure on all types of checking and reviews. The stamp is applied by the Responsible Professional to the cover of a bound set of documents or to individual sheets, if unbound or uses different project personnel. The stamp is designed to track, guide, and document the quality review process and the Standard Checking Procedure described herein. The person responsible for each step of the Submittal Review procedure is required to "sign-off" and to date the document being reviewed on the Quality Control Tracking Stamp as a record that their part of the procedure has been carried out. The Responsible Professional (RP) and Reviewer (R) that produce the work and conduct the Submittal Review will be those designated in the Project Staffing List. The Project Manager

must secure the Department approval of any changes of designated project staff prior to the revised staff beginning work on the project.

<b>QUALITY CONTROL TRACKING STAMP PHASE</b>		
___ <b>SUBMITTAL REVIEW</b>		
Responsible Professional (RP) Reviewer (R)	Initials	Date
<b>PRODUCTION CHECKING COMPLETE</b> READY FOR SUBMITTAL REVIEW (RP)		
<b>CHECKED (R)</b> Correct (Yellow) Change (Red)		
<b>CONCURRENCE (RP)</b> (Red Check OK or X-Out for Disagree)		
<b>CHANGE INCORPORATION (RP)</b> (Yellow Highlighter)		
<b>VERIFICATION (R)</b> (Green Check or Circle & Remark Incorrect)		

### 18.4.2.3 Quality Process Log Requirements

The Standard Project Scope of Services performance criteria requires that the Design Consultant utilize the standard Quality Process Log form (see attached) to monitor, track and document the production and review process for each deliverable and support documentation. Quality Process Logs provide a record of the progress of the project and document the completion of each major phase of the submittal production and review process. In addition, the Project Team members are to utilize their Completion Checklists, as well as the Quality Control Tracking Stamp to promote the thoroughness of the checking process and to eliminate oversights and omissions.

### 18.4.2.4 Standard Documentation Procedure

The Standard Project Scope of Services performance criteria requires that the Design Consultant utilize the standard forms (Completion Checklists, Quality Process Logs, Quality Control Tracking Stamp, Certificate of Compliance) included in this section.

### 18.4.3 Definitions

**3D Model Review** – A review of the 3D model deliverables as defined in the FDOT CADD Manual and the project scope of services. These reviews occur prior to each phase submittal and are performed to ensure consistency between the 3D model and the construction documents. These reviews must be listed on the Quality Process Log and the QC Reviewer identified on the Project Staff List.

**Biddability Review** - A review of construction contract documents, prior to bidding, which seeks to identify errors, omissions, conflicts, ambiguities, inaccuracies, and deficiencies in and

among the construction documents. Biddability Reviews are made in addition to Quality Control (QC) reviews and focus on pay items and uniformity between the plan quantities and the TRNS\*PORT input forms.

**Constructability Review** - A supplemental and specialized review of construction plans and specifications which seeks to identify construction requirements that are impractical, unnecessarily costly, or difficult to build. Constructability Reviews are made in addition to Quality Control reviews, and considers such items as contractor access, site constraints and relationship to other project work.

**Coordination Review** - A review of combined work elements to identify and resolve any conflicts that may exist among all design elements such as lighting and drainage (i.e. foundation conflicts with pipe runs) prior to the Quality Control Reviews.

**Deliverable** - A professional service product that is to be furnished to the Department or others.

**Field Review** - Mandatory visits to the project site to verify compatibility of the design with the field conditions to be encountered during construction.

**Kick-Off Meeting** - A meeting held before any work begins on a project in which the Project Work Plan and quality control requirements are discussed by the Consultant's Project Manager, the Responsible Professionals, the Reviewers, and others as appropriate.

**KMZ Review** - A review of KMZ files to ensure quality and consistency with the KMZ Standards provided on the Turnpike's Design website:

<http://floridasturnpike.com/design/disciplines/roadway.html>

**Independent Peer Review** - A supplemental Quality Control review performed on selected projects, or portions of a project, by an independent team of qualified reviewers. This review is performed in addition to the regular Submittal Reviews and is conducted under the direction of the Consultant's Project Manager. Normally, members of the Independent Peer Review team are not assigned to the same organizational unit or location that managed and produced the project. The Independent Peer Review is a comprehensive examination of the technical aspects of the project design that is made in addition to Submittal Reviews.

**Maintainability Review** - A documented review performed prior to the Phase III submittal to determine the ease with which the roadway can be maintained in order to: isolate and correct defects or their cause, repair or replace damaged components, prevent unexpected failures, maximize the facilities' useful life, meet new requirements, make future maintenance easier, and maximize efficiency, reliability, and safety.

**Production Review** - A documented review performed during production by the component Engineer of Record (EOR) prior to the Quality Control Reviews.

**Project Work Plan (PWP)** - A document that programs the assignment from the Kick-Off Meeting through production, submittal review, coordination, delivery of the product, and archiving of the project records.

**Quality Assurance (QA) Review** - The Principal or Officer-In-Charge review and certification procedure to determine whether or not production and review quality control procedures have been performed effectively and appropriately.

**Quality Control (QC) Process** - Prescribed production and review on procedures by which deliverables are produced, reviewed and brought into compliance with Department and project requirements, professional standards, contractual obligations, and commitments.

**Standard Checking Procedure** - A color-coded check and back check process for reviewing and correcting work products before they are released for use by the Turnpike or otherwise released as a final work product.

**Submittal Review** - Review of submittal documents by the designated Reviewer, a qualified professional other than the Responsible Professional for each element of the work, to see that the work is accurate, conforms to the project requirements, and is free of errors and omissions. The Reviewer checks concepts, methods of preparation, and presentation.

**Project Staffing List** (*Expand or reduce list to include all Sub consultants, and deliverables*)

The following key Project Team members are dedicated to the production and review of the project deliverables shown below. Resumes of the Principal or Officer-In-Charge, Project Manager, Responsible Professionals and Reviewers for all deliverables are attached. The Project Manager must revise the Project Staffing List and secure the approval of any changes in key Project Team personnel during the production and review of the project. Show Professional Registration.

*Add the following exhibit***Exhibit 18-A, Page 1 of 4****Principal or Officer-In-Charge** (*Oversees Project & provides QA Review*): Name**Project Manager** (*Oversees Quality Control & Coordination, provides part of the QA Review*): Name

<b>ELEMENT / TASK</b>	<b>Deliverable</b>	<b>Responsible Professional (RP)</b>	<b>Reviewer (R)</b>
<b>ROADWAY</b> Engineer of Record			
Typical Sections	Package		
Pavement Design	Package		
Existing Roadway Conditions Report	Report		
Geometry & Alignment	Roadway Plans		
Design Documentation	Calculation Book		
Traffic Control Plans	Roadway Plans		
Utility Adjustments	Roadway Plans		
Drainage Design	Roadway Plans		
Geotechnical	Report		
Drainage Report	Report		
Quantity Computation	Calculations		
Specifications	Package		
Mitigation Plans	Roadway Plans		
3D Corridor Model	LandXML and CADD Files		
<b>SURVEY / RIGHT OF WAY</b>			
Design Survey	Field Notes		
Right of way Survey	Field Notes		
Right of way Control Survey	Plans		
Right of way Maps	Maps		
Legal Descriptions	Descriptions		

**Exhibit 18-A, Page 2 of 4**  
Project Staffing List (Cont.)

<b>ELEMENT / TASK</b>	<b>Deliverable</b>	<b>Responsible Professional</b>	<b>Reviewer</b>
<b>SIGNING &amp; MARKING</b>			
Engineer of Record			
Signing Plans	Signing & Marking Plans		
Signing - Summary of Quantities	Signing & Marking Plans		
Pavement Marking	Signing & Marking Plans		
Quantity Computation	Calculations		
Specifications	Package		
<b>SIGNALIZATION</b>			
Engineer of Record			
Signal Design	Signalization Plans		
Phasing & Timing Design	Signalization Plans		
Summary of Quantities	Calculations		
Pole Calculations	Calculations		
Specifications	Package		
<b>LIGHTING</b>			
Engineer of Record			
Lighting / Electrical	Lighting Plans		
Quantity Computation	Lighting Plans		
Intensity & Voltage Calcs.	Calculations		
<b>ENVIRONMENTAL</b>			
Mitigation Report	Report		
Permits	Report		
Wetland Assessment	Report		

**Exhibit 18-A, Page 3 of 4**  
Project Staffing List (Cont.)

<b>ELEMENT / TASK</b>	<b>Deliverable</b>	<b>Responsible Professional (RP)</b>	<b>Reviewer (R)</b>
<b>STRUCTURES</b>			
Engineer of Record			
Bridge Development Report (BDR)	Report		
Bridge Hydraulics Report (BHR)	Report		
Geotechnical	Report		
Structures Plans	Structures Plans		
Design Documentation	Report		
Specification	Package		
Quantity Computation	Calculations		
<b>TOLL PLAZA(S)</b>			
Roadway	Toll Plaza Plans		
Civil Site including utilities	Toll Plaza Plans		
Signing & Pavement Markings	Toll Plaza Plans		
Traffic Control Plan	Toll Plaza Plans		
Landscape & Irrigation	Toll Plaza Plans		
Architectural	Toll Plaza Plans		
Structural	Toll Plaza Plans		
Electrical, Lighting & Toll Equipment Conduit	Toll Plaza Plans		
Mechanical / Plumbing & HVAC	Toll Plaza Plans		
Demolition	Toll Plaza Plans		
Design Documentation	Calculation Book		
Specifications	Package		
Quantities	Calculations		

**Exhibit 18-A, Page 4 of 4**  
**Project Staffing List (Cont.)**

**PROJECT STAFFING LIST** (Cont., for PD&E projects, list all elements & deliverables, including those provided by sub consultants)

<b>Element / Task</b>	<b>Deliverable</b>	<b>Responsible Professional (RP)</b>	<b>Reviewer (R)</b>
<b>PD&amp;E</b>			
State Environmental Impact Report	Reports - Draft & Final		
Type 2 Categorical Exclusion	Reports - Draft & Final		
Environmental Assessment	Reports - Draft & Final		
Finding Of No Significant Impact (FONSI)	Reports - Draft & Final		
Environmental Impact Statement	Reports - Draft & Final		
Preliminary Engineering Report	Reports - Draft & Final		
Noise Impact Study	Reports - Draft & Final		
Air Quality Report	Reports - Draft & Final		
Wetlands Evaluation Report	Reports - Draft & Final		
Biological Assessment	Reports - Draft & Final		
Conceptual Stage Relocation Plan	Reports - Draft & Final		
Contamination Screening Evaluation Report	Reports - Draft & Final		
Cultural Resources Assessment Report	Reports - Draft & Final		
Traffic Report	Reports - Draft & Final		
Location Hydraulics Report	Reports - Draft & Final		
Geotechnical Report	Reports - Draft & Final		
Bridge Development Analysis	Reports - Draft & Final		
Pond Siting Report	Reports - Draft & Final		

*Add the following exhibit*

**Exhibit 18-B**  
Certificate of Compliance

**CERTIFICATE OF COMPLIANCE** (Complete and Submit on Consultant's Letterhead)

**TO:** \_\_\_\_\_, P.E., Turnpike Director of Transportation Development  
 \_\_\_\_\_, P.E., Turnpike Design Engineer  
 \_\_\_\_\_, P.E., Design Program Manager  
 \_\_\_\_\_, P.E., Production Project Manager  
 \_\_\_\_\_, P.E., Turnpike Quality Initiatives Manager

**DATE:** \_\_\_\_\_

**RE:** **QUALITY ASSURANCE (QA) REVIEW - PHASE \_\_\_ SUBMITTAL**

**FPID:** \_\_\_\_\_

**DESCRIPTION:** \_\_\_\_\_

**COUNTY:** \_\_\_\_\_

**COMPONENT SETS:** \_\_\_\_\_

**CONSULTANT:** \_\_\_\_\_

\_\_\_\_\_  
 \_\_\_\_\_ ( ) \_\_\_\_\_

**SUBCONSULTANTS:** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_ ( ) \_\_\_\_\_

This is to certify that we have monitored the quality control (QC) process during production and review of the above submittal, that we have completed and signed the attached QC Checklists for each element of the project, and that we have completed and documented (in the Quality Process Log) the required QA Review of the production and review quality control documentation for all component sets (elements) of the above phase submittal. This QA Review was conducted at the above office on (day, month, year), after all QC procedures were complete. Submittal plans, associated production and review check prints, and quality control documents for the referenced elements (including those of the Sub consultants) have been evaluated, initialed, and are available for review upon request.

This certificate is issued to document our reviews and to confirm that "due or ordinary care" processes were followed in producing the submittal documents. In our professional opinions, these documents meet the standards of the Turnpike and the Florida Department of Transportation, and are ready for review. These requirements include those stipulated in the Project Scope of Services performance criteria and Florida Department of Transportation requirements.

SIGNED: \_\_\_\_\_, P.E.  
 Consultant Principal or Officer –In-Charge

PRINTED: \_\_\_\_\_, P.E.  
 Consultant Principal or Officer-In-Charge

SIGNED: \_\_\_\_\_, P.E.  
 Consultant Project Manager

PRINTED: \_\_\_\_\_, P.E.  
 Consultant Project Manager



*Add the following exhibit*

**Exhibit 18-D**

Certification of Plans, Specifications and Quantities

Date

\_\_\_\_\_, P.E.  
Turnpike Design Engineer  
Florida's Turnpike Enterprise  
Florida Department of Transportation  
P.O. Box 613069  
Ocoee, Florida 34761

Re: Certification of Plans, Specifications and Quantities  
Financial Project ID: 408694-1-52-01  
County: Martin  
Description: Drainage and Safety Improvements at Stuart Interchange

Dear Mr. \_\_\_\_\_:

The undersigned John Doe, P.E. hereby certifies that the plans, specifications and estimates for the above referenced project are free from design errors or omissions, and are ready to process for contract Letting. Further:

- All work has been prepared in accordance with this project Scope of Services.
- Engineering design conforms to the current Florida Department of Transportation (FDOT) Plans Preparation Manual and Design Standards.
- All plans components are complete, accurate, and up to date.
- The Specifications Package has been prepared in accordance with FDOT Specifications Package Preparation Procedure. Included are any necessary Technical Special Provisions.
- All applicable general notes and pay item footnotes are included. All notes are clear and free of ambiguities and contradictions.
- Pay item numbers and quantities are consistent with related pay item notes. The Summary of Pay Items agrees with work called for in the plans.
- Required construction operations will not conflict with each other.
- The project is constructible and traffic can be maintained efficiently.

- All conditions included in permits issued to the Department have been addressed.
- Public Involvement requirements have been met and are documented in the project file.

If you should have any questions, please feel free to give me a call.

Sincerely,  
HOWARD, BRACKINS & ASSOCIATES, INC.

John Doe, P.E.  
Principal-in-Charge

## Chapter 19

### Signing and Sealing Documents

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

#### 19.3 Signing and Sealing Other Documents

*Add the following as items #14 and #15*

14. Lane Closure Analysis on Turnpike Facilities
15. Cross Slope Analysis Report

## Chapter 20

### Plans Processing and Revisions

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

#### 20.1 Plans Processing and Revisions Prior to Award

##### 20.1.4 Revisions to the PS&E Submittal

*Add the following language*

Changes to plans after advertisement require clouding as well as the revision triangle and date.

Any change to the Contract Plans and/or Specifications Package during advertisement require the Design Consultant to submit **Exhibit 20.4-A Contract Addendum Transmittal Memo**.

**Exhibit 20.4-A  
Contract Addendum Transmittal Memo**



*Operates the statewide  
Turnpike System as  
part of the Florida  
Department of  
Transportation*

RICK SCOTT  
Governor

ANANTH PRASAD, P.E.  
Secretary of Transportation

DIANE GUTIERREZ-SCACCETTI  
Executive Director and  
Chief Executive Officer

Turnpike Headquarters:  
Milepost 263, Bldg. 5315  
Turkey Lake Service Plaza  
Ocoee, FL 34761

Mailing Address:  
P.O. Box 613069  
Ocoee, FL 34761

Tel: 407.532.3999

[www.floridasturnpike.com](http://www.floridasturnpike.com)

**CONTRACT E8L46 MODIFICATIONS SUMMARY:**

<b>PLAN REVISIONS</b>	
<b>SHEET</b>	<b>DESCRIPTION OF MODIFICATION</b>
1	Modified index of roadway plans
2	Added pay items
3	Added / revised pay items
13	Revised quantity
14	Added summary box
15	Added / revised pay item notes
17	Revised notes
44A	Added new sheet

<b>PAY ITEMS + QUANTITIES (TRNS*PORT) 123456-1-52-01</b>				
<b>PAY ITEM</b>	<b>SHEET</b>	<b>ADD / MOD / DEL</b>	<b>OLD QUANTITY</b>	<b>NEW QUANTITY</b>
0327-70-7	2	ADD	N/A	1915.000

<b>PAY ITEMS + QUANTITIES (TRNS*PORT) 123456-3-52-01</b>				
<b>PAY ITEM</b>	<b>SHEET</b>	<b>ADD / MOD / DEL</b>	<b>OLD QUANTITY</b>	<b>NEW QUANTITY</b>
0162-1-11	2	ADD	N/A	2054.000
0400-143	3	ADD	N/A	360.000
0401-70-4	3	MOD	26.700	52.300
0570-1-2	3	MOD	12571.000	14747.000

<b>SUPPLEMENTAL SPECIFICATIONS</b>	
<b>SECTION</b>	<b>DESCRIPTION OF MODIFICATION</b>
975	Section 975 Structural Coating Materials is deleted and substituted

**CONTRACT E8L46 MODIFICATIONS NARRATIVE:**

Provide a brief description of modifications.

## Chapter 21

### Transportation Design for Livable Communities

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

#### 21.5 Design Criteria

##### 21.5.10 Landscaping

*Replace the last sentence in the second paragraph with the following*

Landscaping must also comply with the lateral offset and horizontal sight distance requirements found in Section 21.5.6 of this chapter, and Chapters 2, 4, and 25 of this volume. Sight distance limits are measured from the edge of traveled way to the outside edge of the mature growth. In addition, it must be ensured that future growth will not obstruct sight distance.

## **Chapter 22**

### **Lump Sum Project Guidelines**

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

*No changes to the entire chapter*

## Chapter 23

### Design Exceptions and Design Variations

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

#### 23.3 Justification for Approval

*Add the following section*

##### 23.3.1 Turnpike Design Exceptions and Variations

The Consultant must submit all Design Exceptions and Variations electronically 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 digitally signed and sealed Design Exceptions and Variations to the TRE who will forward the approved documents to the Turnpike Design Engineer (TDE) with a recommendation of approval. After receiving concurrence by the TDE, a soft copy of the digitally signed approval letter will be returned to the Consultant.

All Design Exceptions and Variations will require that the appropriate checklist be completed and included with the submittal.

For examples of Turnpike Design Exceptions and Variations document format, refer to Design website, Roadway discipline, and Design Exceptions and Variations link:

<http://floridasturnpike.com/design/disciplines/roadway.html>

#### 23.7 Design Approval Request

##### 23.7.3 Design Variation Approval

*Add the following section*

###### 23.7.3.1 Turnpike Design Variations

Design Variations and deviations from the TPPPH that are approved solely by the Turnpike, do not impact the FHWA 10 Controlling Design Elements and do not impact clear zones, sight distance, or Americans with Disabilities Act (ADA), may be submitted to the Turnpike for approval from the Turnpike Design Engineer as a signed and sealed Design Memorandum.

## **Chapter 24**

### **Federal Aid Project Certification**

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

*No changes to the entire chapter*

## Chapter 25

# Florida's Design Criteria for Resurfacing, Restoration and Rehabilitation (RRR) of Streets and Highways

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

### 25.1 Introduction

#### 25.1.2 Application

*Add the following to the 1st Paragraph*

Unless otherwise noted in this chapter or unless otherwise approved by the Turnpike Design Engineer, projects not designated as “RRR” are required to apply new construction criteria for all design elements.

*Revise 3rd Paragraph*

Existing median crossovers on Interstate highway and freeways must be evaluated for conformance to the criteria in section 2.14.4, Crossovers on Limited Access Facilities, and as modified in TPPPH section 2.14.5. Crossovers that do not meet those criteria must be presented to FTE staff for internal review. FTE staff will provide direction to either remove or relocate the crossover.

### 25.3 RRR Project Design Process

#### 25.3.6 Document the Design Process

*Revise 1st Paragraph*

The designer must include in the design an Existing Roadway Conditions Assessment Report (ERCAR) that substantiates the design process, evaluates all existing conditions against criteria, provides recommendation, and documents decisions made. It must include the following information:

*Add the following Items*

7. The Turnpike will evaluate the ERCAR and determine what elements will require a Design Exception/Variation and/or the enhancement work to be included into the current project or a separate FPID. The consultant will be directed by the FTE Project Manager on how to proceed.

8. ERCAR guidelines can be found at the following link:

<http://floridasturnpike.com/design/docsandpubs.html>

## **25.4 RRR Design Criteria**

### **25.4.3 Pavement Design**

*Add the following sentence*

See section 16.2.7.1 for additional FTE pavement design requirements.

#### **25.4.26 Ancillary Structures (Sign, Signal, Lighting and ITS)**

*Add the following sentence*

For projects that involve the re-use of existing miscellaneous structures, the provisions of section 25.4.26 applies, even if the project is not a RRR.

#### **25.4.26.2 Analytical Evaluation with Proposed Additional Loading or Relocated Structures**

*Replace the last sentence*

Structures must be strengthened or replaced. Design exceptions will not be permitted.

## **25.5 Design Exceptions and Design Variations**

*Revise the following section*

Every effort must be made to adhere to new construction criteria. However, it may be necessary and appropriate to use values that are less than the minimum FTE preferred values. Application of lesser values must be identified and coordinated with FTE. The necessary evaluation, coordination, approval, and concurrence must be obtained at the earliest possible time, but not later than Phase II, so that the denial of any such request will not alter the project letting date.

Design Exceptions and Variations on resurfacing projects will be processed as described in Table 25.5.1:

**Table 25.5.1 - Turnpike Design Exceptions and Design Variations**

	<b>Meets PPM New Construction Criteria?</b>	<b>Meets AASHTO New Construction Criteria?</b>	<b>Meets PPM Chapter 25 Criteria?</b>	<b>Documentation Required</b>	<b>Notes</b>
<b>FHWA 10 Controlling Design Elements</b>	NO	NO	YES	<b>DESIGN TECHNICAL MEMO</b>	If a Design Exception is identified under the ERCAR, the element should then be evaluated against Chapter 25 for final determination of a Design Exception. If the element meets Chapter 25 design criteria, a technical memo will be submitted for approval by the Turnpike Design Engineer documenting that the element meets Chapter 25 criteria and a Design Exception is not required.
	NO	NO	NO	<b>DESIGN EXCEPTION</b>	If a Design Exception is identified under the ERCAR and also does not meet Chapter 25 criteria, then a Design Exception will be processed against current new construction criteria.
	NO	YES	N/A	<b>DESIGN VARIATION</b>	All Design Variations identified under the ERCAR will be processed against PPM and TPPPH new construction criteria.
	YES	YES	N/A	<b>NONE</b>	No documentation required for design elements meeting both PPM and AASHTO New Construction Criteria

All Design Exceptions and Design Variations identified in the ERCAR will be tabulated with the following data as a minimum:

- Number; Location
- Element; Criteria
- Tech Memo (Y/N)
- Estimated Cost
- Explanatory Comments

FTE intent is to accumulate ledger of Design Exceptions and Design Variations on the Turnpike system for inclusion in future widening or reconstruction projects.

## Chapter 26

### Bridge Project Development

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

#### 26.9 Bridge Development Report (BDR)/30% Structures Plans

##### 26.9.3 Format

*Replace the last sentence*

For most projects, the BDR will contain exhibits/sketches and the 30% plan will be submitted after acceptance of the BDR recommendations. Please refer to PPM 26.9.10 for more information.

##### 26.9.4 Aesthetics

*Add the following items*

- FTE offers the following guidance as to the implementation of Structures Design Guidelines 1.4.5 and 7.3.1.c “Concrete Surface Finishes”. In certain cases, project specific conditions may dictate that enhanced aesthetic treatments are required. For projects that involve coatings, textures, colors or graphics on any concrete structures, please see the guidance below, request the appropriate approvals as necessary and coordinate with the FTE Project Manager. “Coating” refers to coatings, colors, tints, or stains. “Structures” include bridges, retaining walls, noise barriers and traffic railings/parapets on bridges/walls.

<b>Projects with</b>	<b>Treatment</b>
New Structures	Bridges – no coating, smooth Retaining Walls – no coating, Ashlar Stone (Type B) or Vertical Fractured Fin (Type G) texture per FDOT Standard Index No. 5200 Noise Walls (ground mounted) – no coating, Ashlar Stone (Type B) or Vertical Fractured Fin (Type G) texture per FDOT Standard Index No. 5200 Noise Walls (barrier mounted) – no coating, smooth
New Structures Adjacent to Existing Structures / Bridge Widening	Generally follow treatment for New Structures above. If project specific conditions warrant (ex: existing coating on an adjacent structure), then coat new structure to match the existing scheme and clean the existing structure. If cleaning alone is insufficient, then clean and recoat the existing

	structure. In all cases, avoid where possible (re)coating areas that require Chief Engineer approval (ex: traffic face of traffic railing). If the Class 5 coating on an existing bridge has degraded to resemble unfinished concrete, the bridge should be considered to "not have a Class 5 coating" for the purposes of SDG 7.3.1.c.
Repainting Existing Steel Girders	Clean the existing concrete. Recoating may be considered in special circumstances.
Aesthetic Commitments	Meet aesthetic commitments.
Other Agencies	No (re)coating. If a Local Maintaining Agency requests (re)coatings then follow SDG 1.4.5.D.
Anti-Graffiti Coating	Do not use.
Textures/Graphics	Use of textures and graphics is acceptable. Get approval if texture/graphic is not from the Standard Index drawings.

The Approval Letter for Concrete Surface Finishes can be found at the following link:

<http://floridasturnpike.com/design/disciplines/structures.html>

4. For projects with steel girders that require painting, coordinate the girder color with the FTE Project Manager. Typically steel girders are painted FTE Green (FC34090).
5. For historical documentation, the following are the colors that were previously used on FTE structures:
  - a) Light Tan: FC23717 for retaining walls
  - b) Dark Tan: FC20475 for traffic railings, copings and slab overhangs
  - c) FTE Green: FC34090 for beams

## 26.10 Bridge Development Report (BDR) Submittal Checklist

*Add the following to item 4*

Bridge deck spread must be evaluated for all bridges. 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, cross slope adjustment, bridge deck drains and conveyance systems. Costs for the bridge deck drainage may be significant when comparing alternative bridge designs.

*Add the following sections*

## **26.19 Deviations from Structures Manual**

### **26.19.1 Bridge Deck Grooving**

Structures Manual – Volume 1: Structures Design Guidelines – Section 7.7 is modified/supplemented as follows:

All new bridge decks (including new decks of bridge widenings) that will not be surfaced with asphalt must be grooved. If an existing bridge deck (including existing deck of bridge widenings) is un-grooved, perform a hydroplaning analysis per TPPPH Section 2.1.5.1 and add grooving if required by the analysis. Grooving an un-grooved existing deck requires approval of the DSDE for evaluation of project specific conditions and alternatives to grooving where necessary.

### **26.19.2 Barrier Conduits**

Structures Manual – Volume 1: Structures Design Guidelines – Section 6.7.1.F is modified/supplemented as follows:

All bridge barriers and parapets must have two 2” diameter conduits per Index 21210 except where prohibited by SDG 6.7.1.F. Conduits not intended for current use must be labeled as "future use". In the case of a parapet and a barrier on one side of the structure (ex: sidewalk configuration), conduit is required in whichever feature is located closest to the coping. Median barriers must also have two 2” diameter conduits. In the case of adjacent bridges with back-to-back barriers with a clear gap of 5-ft or less, conduit is only required in one barrier. These requirements also apply to retaining wall barriers/parapets on bridge approaches.

### **26.19.3 Bridge Widenings**

Structures Manual – Volume 1: Structures Design Guidelines – Section 7.3 is modified/supplemented as follows:

SDG Section 7.3 applies to all portions of the existing bridge, both superstructure and substructure. Bridge widenings should be "in-kind" with the existing structure. As an example, if an existing end bent has battered piles, then the proposed end bent extension should provide a means of lateral load restraint. Design Variations for overstress, as noted in SDG Section 7.3.4.B, will not be granted.

### **26.19.4 Pier Retrofits**

Structures Manual – Volume 1: Structures Design Guidelines – Section 2.6.4.E shall add the following sentence:

Every effort should be made to use pier protection barriers. Existing pier retrofits require approval of the Turnpike Structures Design Engineer.

## **Chapter 27**

### **Hydraulic Data and Agency Permits**

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

*No changes to the entire chapter*

## Chapter 28

### Shop and Erection Drawings

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

*Replace within whole chapter*

Where stated in the Plans Preparation Manual (PPM), Volume 1, Chapter 28, any reference to Engineer of Record, must read as follows: Architect of Record and/or Engineer of Record (AOR/EOR).

#### 28.1 Introduction

*Add the following before paragraph 1*

Typically, Florida's Turnpike Enterprise (Department's) Shop Drawing Review Office will provide the Contractor with the Shop Drawing Routing Chart (Refer to **Exhibit 28-B**) and Shop Drawing Procedures information package at the Preconstruction Conference. This information addresses requirements for the submission of shop drawings, which provides an overview of the review and approval process.

Modification for Non-Conventional Projects:

In 1<sup>st</sup> sentence, delete reference to **Exhibit 28-B** and replace with **Exhibit 28-E**.

#### 28.2 Drawing Submittals Required

*Replace title with the following*

#### 28.2 Shop Drawings Required

*Delete paragraph 4 and add the following*

Material certifications, welding procedures, paint procedures and concrete mix designs are typically submitted by the Contractor to the Engineer (CEI) who forwards the certifications to the State Materials Engineers in Gainesville. These items do not need to be submitted to the Department's Shop Drawing Review Office for review and approval by the Engineer of Record. They are submitted through the ProjectSolve system as Pre-Qualified submittals within the shop drawing module, which are submitted directly to the Engineer (CEI) for review. For non-standards items, the Engineer (CEI) will typically request approval by the Engineer of Record regarding applicability. Material certifications for items on the Approved Product List (APL) are typically submitted by the Contractor to the Engineer (CEI) through ProjectSolve.

## 28.3 Contractor Information Required

*Replace last sentence of paragraph 2 with the following*

Other documents such as trade literature, catalogue information, calculations and manuals must be submitted through ProjectSolve with a Table of Contents coversheet.

*Replace the following after paragraph 3*

### Modification for Non-Conventional Projects:

Delete the above paragraph and replace with the following:

The Design-Build Firm is responsible for the preparation and approval of all shop drawings and calculations. Once the shop drawings have been reviewed and approved by the Contractor and Architect of Record/Engineer of Record, submit shop drawings and calculations to the Department for review and approval thru ProjectSolve. Before submission, the Contractor and AOR/EOR must determine and verify all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog number and similar data with respect thereto, and must review and coordinate each drawing with other shop drawings and with the requirements of the Contract Plans and Specifications. The Contractor and the AOR/EOR must stamp and initial each sheet indicating that the shop drawing review and approval is for conformance with the design concept of the project and for conformance with information given in the Contract Plans and Specifications (including Supplemental Specifications and Special Provisions).

Only shop drawings stamped “APPROVED” or “APPROVED AS NOTED” will be forwarded to the Department for review. Shop drawings submitted without stamps from Contractor and the AOR/EOR, will be returned for re-submittal. When the Department requires a resubmittal, the drawings must be modified by the Contractor, resubmitted to the AOR/EOR for approval, and then forwarded to the Department for review. In the case where the AOR/EOR generates the shop drawings for the project, another Engineer within their firm, not involved in the production of the shop drawing, must review and stamp the drawings per the requirements stated herein.

*Replace paragraph 5 with the following*

At the time of each submission, the Contractor must give specific written notice, along with an itemized list of all deviations/variations from the Contract Plans and Specifications, in a transmittal letter along with the Shop Erection Drawing submission. In addition, the drawings must contain a specific notation which explicitly and prominently calls out any deviations. Approval of Shop Erection Drawings will not constitute nor be considered grounds for approval of a variation in which the project requirements are affected unless specifically indicated as such and noted on the submission by the AOR/EOR or the Department’s approval comments as returned with the shop drawing to the Contractor.

*Add the following paragraphs*

Submit shop drawings/submittals electronically utilizing Florida's Turnpike Enterprise website, ProjectSolve. Assign a unique submittal number to Shop Drawing.

Shop drawings will be submitted in Portable Data Format (pdf), using 300 dpi resolution and in 8-bit up to 24-bit color. Once the Contractor has uploaded the shop drawing to ProjectSolve, the AOR/EOR is notified via an email generated by the system, notifying a shop drawing has been submitted for review; the Engineer (CEI) is copied on the email notification.

Any comments or markings provided by the Contractor or their Subcontractor must be indicated in blue or black. In the case there is no place to incorporate stamping on the front page, and considering stamping by others (AOR/EOR and Turnpike), insert a blank page to indicate back side of page, and page number (i.e., back of Page 1 of 6). Do not stamp over literature, dimensions or details.

**Modification for Non-Conventional Projects:**

Expand the above paragraph with the following:

In addition, on shop drawing, the date on stamp must supersede the date of when the contract documents and plans were stamped "Released for Construction".

If the shop drawings consist of samples, as outlined in the Contractor's shop drawing item list, it is acceptable for the data to be submitted electronically through ProjectSolve. Data must include the following: Manufacturer, Product Name and Product Number. These pages must be stamped. It will be at the discretion of the Department, if submissions of original samples are required. The Contractor will coordinate with the Architectural Department prior to the submission.

If original samples are required, the Contractor must submit three (3) samples for proper processing, in addition to the number of samples needed by the Contractor. The Contractor is required to stamp the samples, include the FPID and their shop drawing submittal number. Initiate the shop drawing review process through ProjectSolve, by uploading the transmittal letter and indicate in the "Comment" area on the shop drawing module page that samples have been forwarded to the AOR/EOR via Overnight Courier Service. The AOR/EOR must confirm within ProjectSolve "Comment" area that they are in receipt of the samples

Once samples have been reviewed by both the AOR/EOR and Florida's Turnpike Enterprise, the Department's Shop Drawing Review Office will distribute, if allotted number of samples: one (1) to the Engineer (CEI) and the Department's Shop Drawing Review Office will retain one (1) for their files. Any remaining samples will be provided to the Contractor.

## 28.4 Submittals Requiring a Specialty Engineer

*Replace title with the following*

## 28.4 Shop Drawings Requiring a Specialty Engineer

*Replace last paragraph with the following*

When a shop drawing requires a Specialty Engineer, the sealed prints and calculations will ultimately be retained by the Department in electronic format, as the official record shop drawing. Also refer to Transmittal of Submittals hereinafter.

*Add the following paragraph*

Prior to Contractor uploading the shop drawing to ProjectSolve, ensure that the seal (rubber ink stamped or embossed) is legible. Failure to do so will constitute the submission as incomplete, and the shop drawing will be submitted back to Contractor as “Not Reviewed”. Resubmittal will be required. It is acceptable for the Contractor and the AOR/EOR to stamp the cover page of the calculations only. Each sheet of the shop drawing must be stamped.

## 28.5 Scheduling of Submittals

*Replace title with the following*

## 28.5 Scheduling of Shop Drawings

*Replace paragraph 1 with the following*

The Contractor is required to submit a Shop Drawing Schedule/Submittal Item List to the Engineer (CEI) within 60 days of the start of construction operations, and prior to the submission of any shop drawings. Adherence to the Shop Drawing Schedule/Submittal Item List is intended to allow for the planning of resources, and to reduce the possibility of a large number of shop drawings being forwarded for review concurrently.

The list is to be submitted utilizing the required excel format, which will be provided by the Engineer (CEI) to the Contractor. For each planned shop drawing submission, and when developing the Shop Drawing Schedule/Submittal Item List, define the following; description of item, structure identification number, bridge number, gantry identification number and location, specification section numbers and/or roadway divisions. In addition, if the project contains Express Lane Tolling components, identify these components by site location (i.e., building, gantry structures, etc.). Combining shop drawings for multiple sites is not acceptable.

Traffic and ITS components must be identified as separate line items for review. Ensure to indicate in the item description if they apply to Traffic or ITS, since they both share the same roadway division number.

Refer to *Exhibit 28-A*, which depicts the review coordination of the shop drawing/submittal item list. The Contractor will provide the completed list to the Engineer (CEI).

## 28.6 Transmittal of Submittals

*Replace title with the following*

## 28.6 Transmittal of Shop Drawings

*Replace paragraph 2 with the following*

*Exhibits 28-A through 28-C* and Exhibit 28-E show the flow of shop drawings submissions during the review process. These Exhibits are shown at the end of this chapter.

*Exhibit 28-A*            **Florida’s Turnpike Enterprise (FTE) Flow Chart for Shop Drawing/Submittal Item List, Reviewer Coordination for Items Deemed “Critical”, Design Bid Build (Conventional) Projects**

*Exhibit 28-B*            **Florida’s Turnpike Enterprise (FTE) Shop Drawing Routing Chart for Design Bid Build (Conventional) Projects**

*Exhibit 28-C*            **Florida’s Turnpike Enterprise (FTE) Shop Drawing Review Office, Department Review Office Distribution Chart**

*Exhibit-D*                *Not Used*

*Exhibit 28-E*            **Florida’s Turnpike Enterprise (FTE), Shop Drawing Routing Chart for Design Build (Non-Conventional) Projects**

*Replace the following after paragraph 2*

Modification for Non-Conventional Projects:

Delete the above paragraph and replace with the following:

*Exhibit 28-E* depicts the distribution flow of shop drawing during the review process, through ProjectSolve.

*Exhibit 28-E*            **Florida’s Turnpike Enterprise (FTE) Shop Drawing Routing Chart for Design Build (Non-Conventional) Projects**

*Replace paragraph 3 with the following*

The Special Provisions for the project may denote the procedure to be followed. Furthermore, the procedural requirements for shop drawings submissions and the website URL will be provided at the preconstruction conference for the project. In the absence of such instructions, the following, as outlined within this Chapter applies.

## **28.6.1 General Submittal Requirements**

*Replace title with the following*

## **28.6.1 General Shop Drawing Requirements**

*Replace this section with the following*

On projects where the AOR/EOR is a Consultant to the Department, and unless otherwise directed at the project's preconstruction conference, the Contractor must submit shop drawings to the Consultant utilizing ProjectSolve. On projects where the Department is the AOR/EOR, the Contractor must submit shop drawings to the Department utilizing ProjectSolve. All drawings must be on sheets no larger than 11" x 17" in order to facilitate electronic filing. For plotting requirements, please refer to *FDOT CADD Production Criteria Handbook*. The Contractor's letter of transmittal must accompany the drawings.

*Delete Modification for Non-Conventional Project after paragraph 1*

## **28.6.2 Requirements for Department EOR**

*Replace title with the following*

## **28.6.2 Requirements for Department Architect of Record/Engineer of Record**

*Replace this section with the following*

On projects where the AOR/EOR is the Department in-house staff, shop drawings will be transmitted to the Department's Shop Drawing Review Office or as directed at the preconstruction conference. The Department's Shop Drawing Review Office is the principal contact group and "clearing house" for all construction shop drawings and information desired by the Contractor regarding structural, mechanical, electrical, tolling and vertical elements.

## **28.6.3 Requirements for Consultant EOR (Full Services)**

*Replace title with the following*

## **28.6.3 Requirements for Consultant Architect of Record/Engineer of Record (Full Services)**

*Add the following paragraphs*

On projects where the AOR/EOR is a Consultant to the Department, and has been retained by the Department to review construction items, shop drawings, (unless otherwise noted below) must be submitted by the Contractor directly to the Consultant thru ProjectSolve. Upon receipt of the shop drawing, the Consultant will perform the review, note any comments directly on the sheets indicate their dispositions by electronically stamping the sheets as described within this chapter, and finally submit the shop drawing, through ProjectSolve to the Department's Shop Drawing Review Office for review and distribution to the appropriate responsible lead reviewer and final processing (Refer to *Exhibit 28-C*).

When shop drawings require a Specialty Engineer, the AOR/EOR must verify the Contractor has properly submitted the shop drawing and the seal is a legible image. If the seal is not legible, the AOR/EOR will coordinate with the Contractor to determine if they can acquire a legible copy in a reasonable amount of time. If not, the shop drawing will require resubmission. The AOR/EOR must coordinate with the Department's Shop Drawing Review Office to properly process the shop drawing through ProjectSolve and request resubmission.

As the AOR/EOR, when reviewing signed/sealed calculations and shop drawings, it is acceptable to incorporate the disposition stamp on the cover sheet of the calculations only. Each sheet of the shop drawings must be stamped by the AOR/EOR.

The AOR/EOR is responsible for reviewing the Contractor's Shop Drawing/Submittal Item List, to ensure verification for its technical components per the Design Plans (Refer to *Exhibit 28-A*).

AOR/EOR receives the shop drawing from the Contractor through ProjectSolve. It is the responsibility of the AOR/EOR to ensure that the Contractor has submitted the shop drawing as outlined within this chapter. If the shop drawing has not been provided in complete format, the AOR/EOR must coordinate with the Engineer (CEI) and/or Contractor. The AOR/EOR will make determination, based on coordination, if the Contractor is required to resubmit. The AOR/EOR must coordinate with the Department's Shop Drawing Review Office, to process the shop drawing through ProjectSolve and request resubmission.

If it is determined that a submission is from the Approved Product List (APL), product is to be reviewed by the Engineer (CEI). The AOR/EOR must coordinate with the Engineer (CEI), and contact the Department's Shop Drawing Review Office to amend the ProjectSolve System for proper routing to the Engineer (CEI).

The AOR/EOR reviews the shop drawing and implements any comments in red, stamps every sheet of the shop drawing with their disposition; "APPROVED", "APPROVED AS NOTED", "RESUBMIT" OR "NOT APPROVED", include initials and date. Any additional comments may be added where they apply, under the stamp or in an attached Memorandum.

If the shop drawing consists of samples, the AOR/EOR must incorporate their disposition stamp. If physical samples are provided by the Contractor, once the AOR/EOR has reviewed and stamped, they will retain one (1) copy for their files, and return the remaining original samples to the Department's Shop Drawing Review Office (via overnight courier), unless specific instructions have been provided. Color should be either to match existing, or if the AOR/EOR is responsible for choosing the color and should be noted.

The AOR/EOR must notify the Florida's Turnpike Enterprise Production Project Manager if shop drawing submissions deviate from contract requirements.

Once the AOR/EOR has completed the review of the shop drawing, it is submitted through ProjectSolve to the Department's Shop Drawing Review Office for final processing (Refer to *Exhibit 28-B*).

### **28.6.3.1 Review by Engineer of Record Only**

*Replace title with the following*

### **28.6.3.1 Review by Architect of Record/Engineer of Record Only**

*Replace this section with the following*

Refer to Section 28.6.3 for AOR/EOR requirements. On projects where the AOR/EOR is a Consultant to the Department, and has been retained by the Department to review construction items without follow-up review by the Department, the Consultant will assume the responsibility of the owner's agent. The reviewing consultant is encouraged to communicate with fabricators, contractors, specialty engineers and the Department's Shop Drawing Review Office Responsible Lead Reviewer (refer to *Exhibit 28-C*) to clarify concerns before returning the shop drawing to the Contractor. The reviewing Consultant will also contact the Department's Shop Drawing Review Office if unsure of the Department's position on certain issues during the review. Shop drawings should not be stamped "RESUBMIT" if "APPROVED AS NOTED" will suffice. Shop drawings (unless otherwise noted below) must be submitted by the Contractor directly to the Consultant. Upon receipt of the shop drawing, the Consultant will perform the review and note any comments directly on the sheets, indicate the disposition by electronically stamping the sheets as described within this chapter, and submit the shop drawings back to the Department's Shop Drawing Review Office through ProjectSolve, for final processing.

### **28.6.3.2 Review by Engineer of Record and the Department**

*Replace title with the following*

### **28.6.3.2 Review by Architect of Record/Engineer of Record and the Department**

*Replace the whole section with the following*

On projects where the AOR/EOR is a Consultant to the Department, and has been retained by the Department to review construction items, shop drawings, (unless otherwise noted below) must be submitted by the Contractor directly to the Consultant thru ProjectSolve. Upon receipt of the shop drawing, the Consultant will perform the review and note any comments directly on the sheets, indicate the disposition by electronically stamping the sheets as described within this chapter, and submit the shop drawing through ProjectSolve to the Department's Shop Drawing Review Office for review to the appropriate responsible lead reviewer and final processing (Refer to *Exhibit 28-C*).

The Department will continue to overview those shop drawings which are deemed "Critical" (ADA, Life Safety and/or Tolling elements). A project specific list of "Critical" shop drawings will be determined by the Department. Upon review of these shop drawings, the Department's reviewer will indicate the disposition by electronically stamping the sheets, sign and date (Refer to *Exhibit 28-A*).

**Modification for Non-Conventional Projects:**

Delete the above paragraph and replace with the following:

The Department will overview all shop drawings. Upon review of these shop drawings, the Department's reviewer will indicate the disposition by electronically stamping the sheets, sign and date (*Refer to Exhibit 28-E*).

### **28.6.5 Requirements for Architectural or Building Structures**

*Replace this section with the following*

Shop drawings related to architectural or building structures must follow the standard Florida's Turnpike Enterprise Shop Drawing Review Process as required within this chapter.

### **28.6.6 Requirements for Roadway Submittal Items**

*Replace title with the following*

### **28.6.6 Requirements for Roadway Shop Drawing Items**

*Replace this section with the following*

Shop drawings related to roadway plans such as lighting, attenuators, non-standard drainage structures, retained earth wall systems, etc. (except bridge items such as poles, bracket arms, or as noted below) must be distributed in accordance to the Construction Project Administration Manual, (Topic No. 700-000-000) for the component involved or as otherwise directed at the preconstruction conference. Shop drawings related to bridge items must be submitted as required within this chapter.

### **28.6.8 Miscellaneous Requirements and Assistance**

*Replace this section with the following*

For items not specified above or for which questions may arise as to shop drawing requirements, the Contractor should be advised to contact the Engineer (CEI) or the appropriate Department's Shop Drawing Review Office personnel.

## **28.7 Disposition of Submittals**

*Replace title with the following*

### **28.7 Disposition of Shop Drawings**

*Replace paragraph 1 with the following*

The approval or disapproval of shop drawings by the AOR/EOR must indicate one of the following designations: "APPROVED" (no further action required), "APPROVED AS NOTED", (make corrections noted, no further submission is required), "RESUBMIT", (make corrections noted and

resubmit for approval), or “NOT APPROVED” (rejected, do not resubmit the concept or component as submitted).

***Add the following after paragraph 1***

The approval or disapproval of shop drawings by the Department must be indicated by one of the following designations: “REVIEWED”, (approved, no further action required), “FURNISH AS NOTED”, (approved as noted, make corrections noted, no further submission is required), “FURNISH AS NOTED/SUBMIT SPECIFIC ITEM”, (approved as noted, approval is contingent upon submission of additional information for review and approval), “REJECTED”, (not approved, do not resubmit the concept or component as submitted), “REJECTED/SUBMIT SPECIFIC ITEM”, (not approved, submit additional information for review and approval), “REVISE/RESUBMIT”, (resubmit with corrections), “NOT REVIEWED”, (no review required), “SUBMIT SPECIFIC ITEM”, (submit additional information for review and approval), “NOT REVIEWED/SUBMIT SPECIFIC ITEM”, (not reviewed, submit additional information for proper review and approval).

***Replace the following after paragraph 2***

**Modification for Non-Conventional Projects:**

Delete the above paragraph and replace with the following:

The approval or disapproval of shop drawings by the AOR/EOR will be indicated by one of the following designations: “APPROVED” (no further action required), “APPROVED AS NOTED” (make corrections noted, no further submission is required), “RESUBMIT” (make corrections and resubmit for approval), or “NOT APPROVED” (rejected, do not resubmit the concept or component as submitted). Only shop drawings that have been “APPROVED”, or “APPROVED AS NOTED” will be submitted to the Department, for review.

Upon completion of the Department’s review, the Department submits the shop drawing to the Engineer (CEI), through ProjectSolve, who must stamp the drawings, “RELEASE FOR CONSTRUCTION”, “RELEASE FOR CONSTRUCTION AS NOTED”. Shop drawings which are stamped “RESUBMIT”, by the AOR/EOR, will not be submitted to the Engineer (CEI) for stamping.

***Replace paragraph 3 with the following***

All Consultants reviewing shop drawings must red ink stamp and initial each item, as noted above with the firm’s appropriate stamp. Consultants must declare any limitations to the extent of their review and approval by the terminology of their standard stamp and/or by additional written and “ballooned” notes on the shop drawing items. When the AOR/EOR is a Consultant, and when a Sub-consultant is retained to assist in the shop drawing review, the AOR/EOR must signify disposition of the shop drawing as noted above with the AOR/EOR’s firm’s appropriate stamp prior to distribution or prior to submitting, through ProjectSolve, to the Department. In this event, it is the AOR/EOR’s prerogative to also require a disposition stamp by the Sub-consultant.

***Replace paragraph 4 with the following***

When a shop drawing contains deviations from the Contract Plans and Specifications, the Consultant must contact Florida's Turnpike Enterprise Project Manager, who will coordinate with the Construction Project Manager, and will determine as to whether or not a Supplemental Agreement or Cost Savings Initiative Proposal (CSIP) is required. If either procedure is required to be initiated, the shop drawing will not be reviewed until a decision is finalized.

***Replace paragraph 13 with the following***

***Exhibits 28-A*** through ***28-C*** reflect the distributional flow of a shop drawing. When the Department concurs with the Consultant's review and disposition of the shop drawing, the Department will electronically stamp and submit the shop drawing through ProjectSolve. The Consultant is provided a system generated email notification. Should the Department's review and/or dispositions of the shop drawing differ from that of the Consultant, the final disposition will be resolved by coordination between the firms, the final disposition on the shop drawing is reflected by the Department's disposition stamp.

***Replace the following after paragraph 13*****Modification for Non-Conventional Projects:**

Delete the above paragraph and replace with the following:

***Exhibit 28-E*** shows the shop drawing and distributional flow of a shop drawing. When the Department concurs with the Design-Build Firm's AOR/EOR review and disposition, the Department will electronically stamp and distribute the shop drawing through ProjectSolve. Should the Department's review and/or disposition differ from that of the Design-Build Firm's AOR/EOR, the final disposition on the shop drawing is reflected by the Department's disposition stamp.

**28.9 Distribution of Submittals**

***Replace title with the following***

**28.9 Distribution of Shop Drawings**

***Replace paragraph 1 and Table 28.3 with the following***

Refer to ***Exhibit 28-B*** for the distributional flow of a shop drawing through ProjectSolve.

***Replace paragraph 2 with the following***

When precast/prestressed concrete components are involved, the Department's District Precast Engineer is furnished an electronic copy, via email. When structural steel components are involved, the Department's Assigned Commercial Inspection Agency (ACIA) is furnished an electronic copy, via email. When mechanical/electrical components of movable bridges are involved, the Mechanical/Electrical Section of the State Structures Design Office (SSDO) is furnished an electronic copy, via email.

*Replace paragraph 4 with the following*

When approval of a shop drawing is denied (“RESUBMIT” or “NOT APPROVED”), distribution of the shop drawing will occur through ProjectSolve. The Contractor, AOR/EOR and the Engineer (CEI) are notified by a system generated email.

*Replace the following after paragraph 4*

**Modification for Non-Conventional Projects:**

Refer to *Exhibit 28-E* which shows the shop drawing flow diagram for Design-Build Projects.

When precast/prestressed concrete components are involved, the Department’s District Precast Engineer is furnished an electronic copy, via email. When structural steel components are involved, the Department’s Assigned Commercial Inspection Agency (ACIA) is furnished an electronic copy, via email. When mechanical/electrical components of movable bridges are involved, the Mechanical/Electrical Section of the State Structures Design Office (SSDO) is furnished an electronic copy, via email.

The Contractor is responsible for transmitting a copy of the processed shop drawing to the appropriate subcontractor, specialty engineer or fabricator.

## **28.11 Submittal Activity Record (Logbook)**

*Replace title with the following*

## **28.11 Shop Drawing Activity Record (Logbook) and ProjectSolve**

*Replace paragraph 1 with the following*

The Department’s Shop Drawing Review Office is the Final Review Office and maintains the Shop Drawing Activity Record (Logbook), through ProjectSolve. A log can be generated for each project where shop drawings have been submitted. Reports can be generated on a daily basis.

The following minimum data is entered and generated within the ProjectSolve System.

1. Financial Project ID
2. Contract Number
3. Roadway Division/Specification Section
4. Florida’s Turnpike Enterprise (FTE) Shop Drawing Number
5. Description of Shop Drawing Entry
6. AOR/EOR Submittal Number (if applicable)
7. Contractor Submittal Number (if applicable)
8. Date Submitted by Contractor to the AOR/EOR
9. Date Submitted by AOR/EOR to the Department’s Shop Drawing Review Office
10. Date Distributed by the Final Review Office to the Contractor
11. AOR/EOR Disposition
12. FTE Disposition

ProjectSolve maintains a historical record of activity devoted to an individual shop drawing as that for the project as a whole. It can serve as a verification of review time, to respond to inquiries of a particular shop drawing's status and as a record of manpower effort to aid in estimating and allocating future workload.

## **28.12 Archiving Record Shop Drawings**

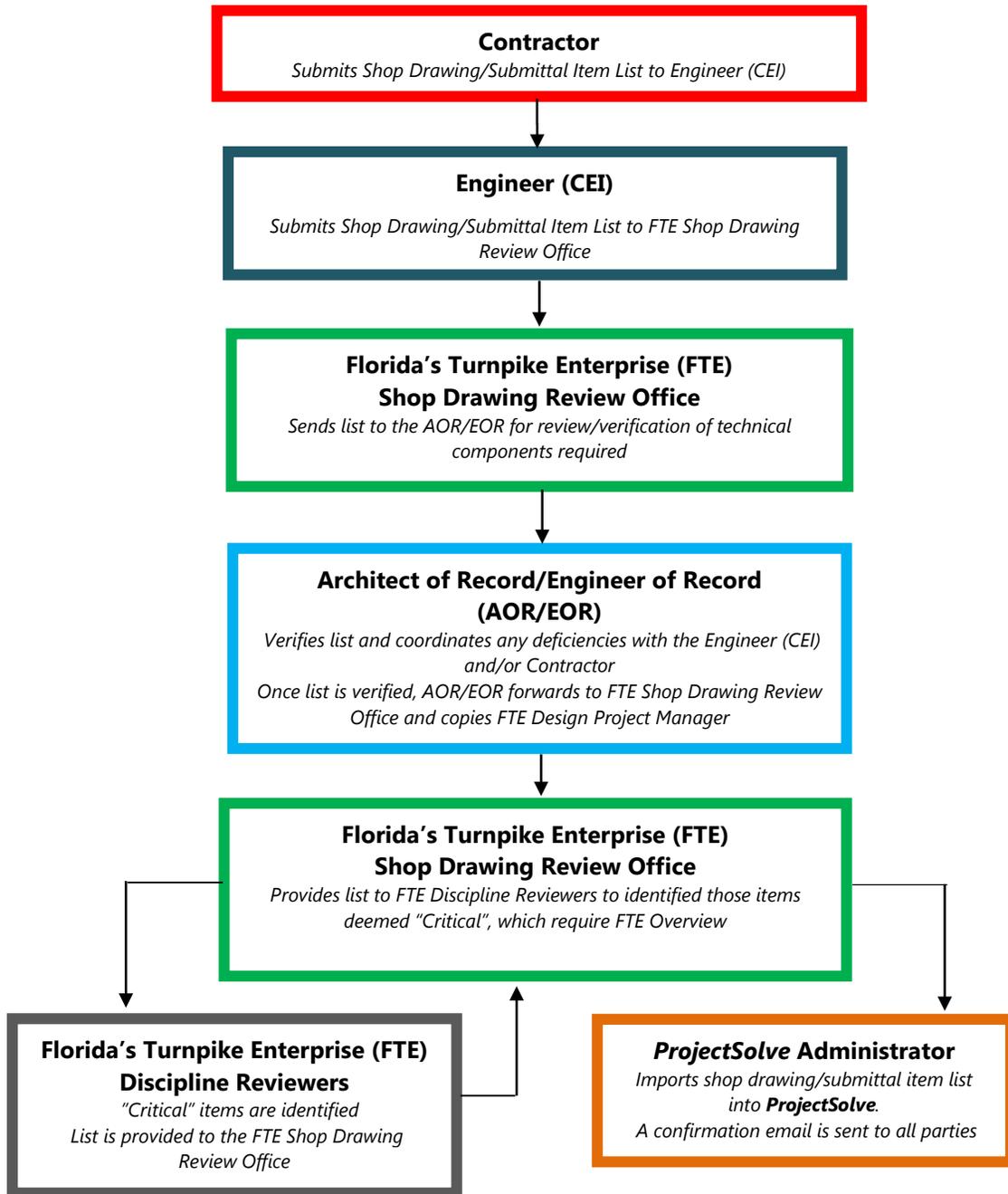
*Replace this section with the following*

Prior to project completion, the Engineer (CEI) must coordinate with the Department's Shop Drawing Review Office to verify resolution of resubmittals for all project shop drawing submissions. If, for any reason a resolution of a shop drawing has not taken place, the Department's Shop Drawing Review Office will request the Engineer (CEI) to coordinate with the Contractor to obtain resolution.

Upon completion and acceptance of the construction project by the Department (usually by receipt of a Notice of Acceptance), the Department's Shop Drawing Review Office imports the shop drawings into the EDMS System. The Shop Drawing Activity Record Logbook (Shop Drawing Status Report) is also generated through ProjectSolve, which is also imported into the EDMS system.

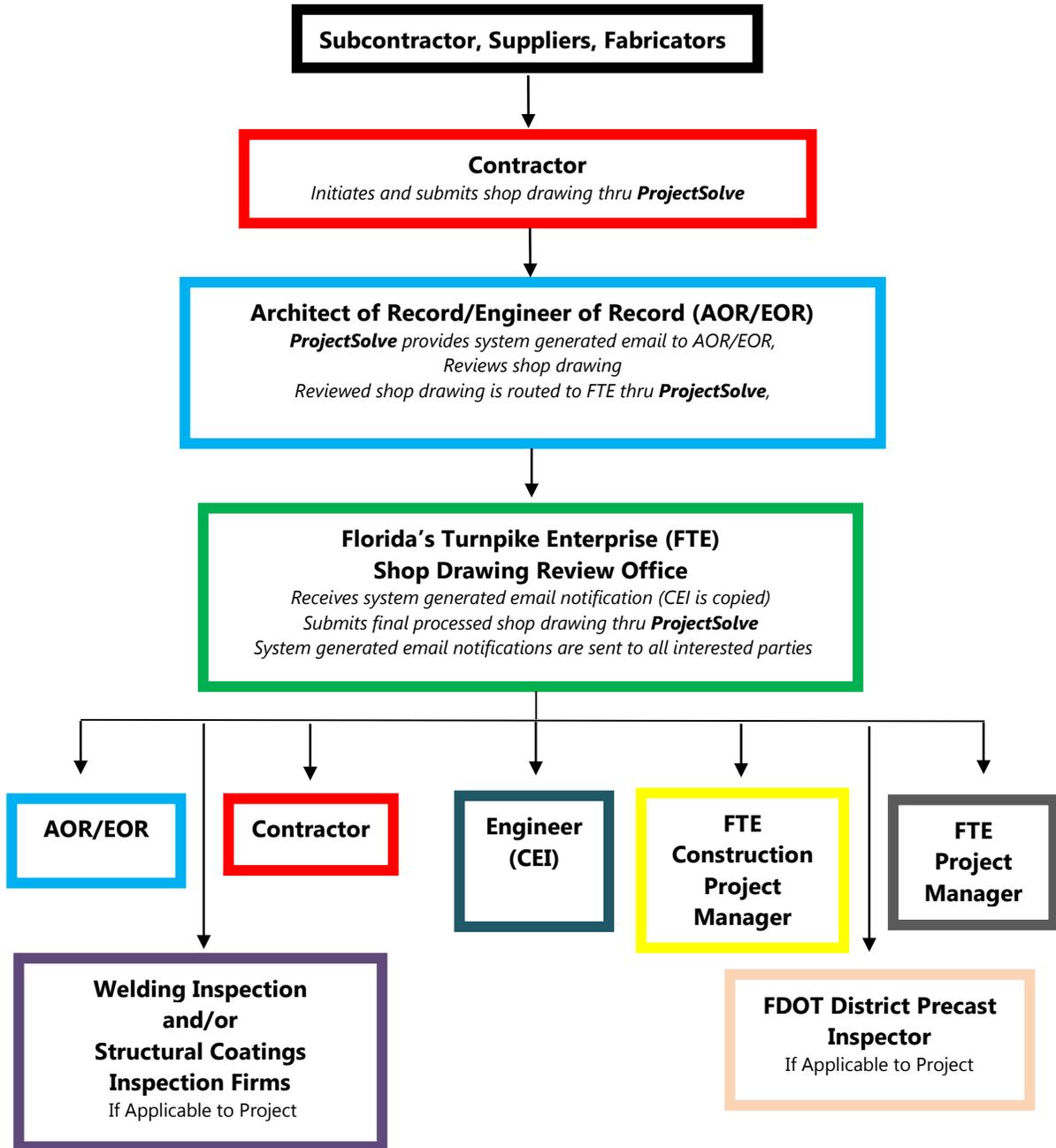
*Replace the following Exhibit*

**Exhibit 28-A**  
**Florida’s Turnpike Enterprise (FTE) Flow Chart for Shop Drawing/Submittal Item List**  
**Reviewer Coordination for Items Deemed “Critical”**  
**Design Bid Build (Conventional) Projects**



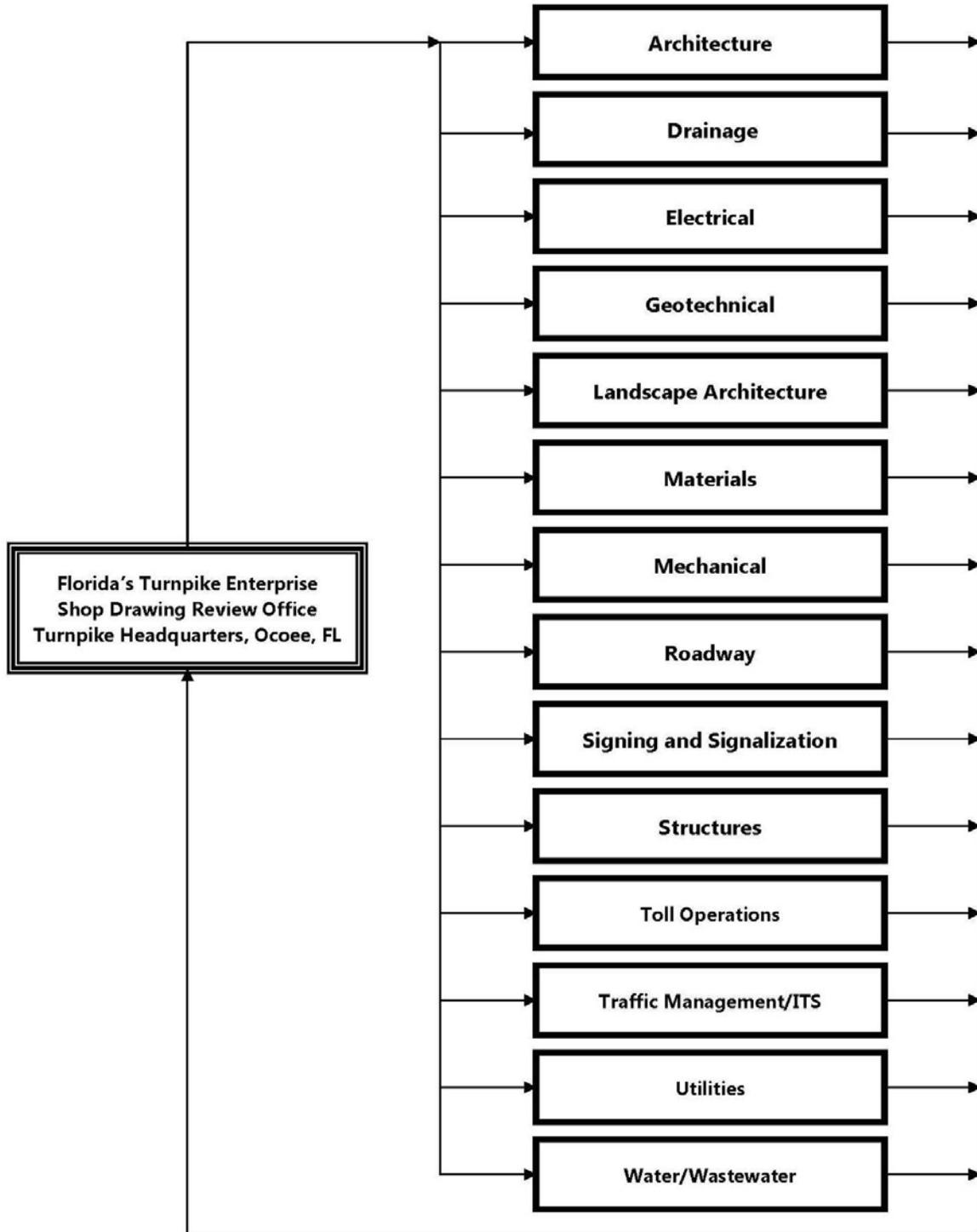
*Replace the following Exhibit*

**Exhibit 28-B**  
**Florida's Turnpike Enterprise (FTE)**  
**Shop Drawing Routing Chart for Design Bid Build (Conventional) Projects**



*Replace the following Exhibit*

**Exhibit 28-C**  
**Florida's Turnpike Enterprise (FTE)**  
**Shop Drawing Review Office**  
**Department Review Office Distribution Chart**

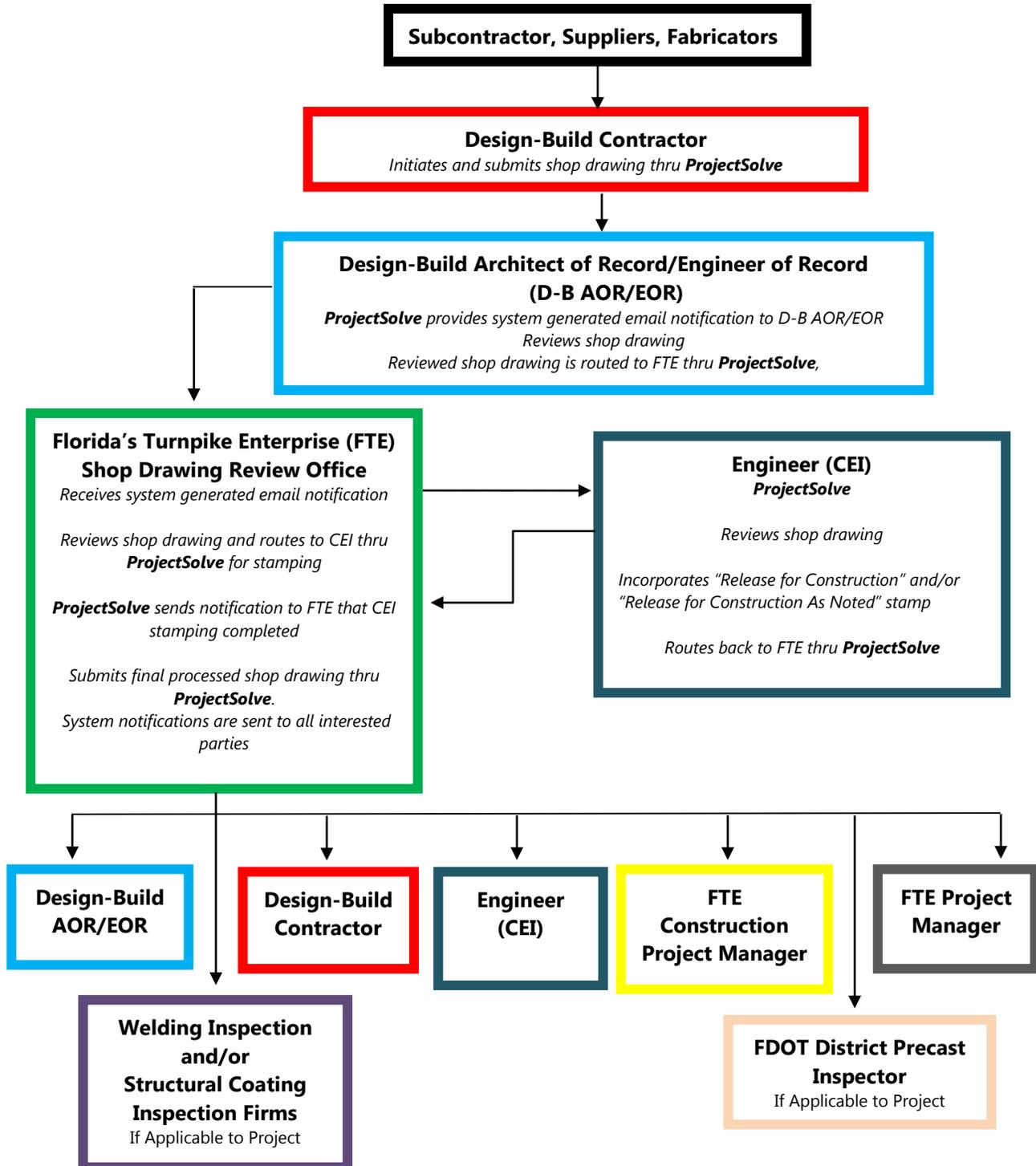


*Delete the following exhibit*

***Exhibit 28-D***

*Replace the following Exhibit*

**Exhibit 28-E**  
**Florida's Turnpike Enterprise (FTE)**  
**Shop Drawing Routing Chart for Design Build (Non-Conventional) Projects**



## Chapter 29

# Structural Supports for Signs, Luminaires, and Traffic Signals

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

### 29.1 General

*Add the following paragraphs*

For projects that involve the re-use of existing miscellaneous structures, the provisions of Section 25.4.26 applies, even if the project is not a RRR.

During the design process, the Design Consultant should coordinate with FTE Maintenance to secure structure numbers for overhead cantilever and span sign structures. These structure numbers should be used in the Signing and Pavement Markings plan set.

Miscellaneous Structures (sign structures, mast arms, etc.) must use a galvanized coating per the applicable Standards. Do not paint or otherwise coat these structures without consent of FTE. Coordinate with the Turnpike Project Manager as necessary.

Typically if a drilled shaft supporting a sign structure is deemed unacceptable in construction, a replacement shaft can be constructed nearby. The Consultant must identify gantry foundation locations, which are critical (cannot be moved without design or permit changes), and follow the General Tolling Requirements.

### 29.2 Sign Support Structures

*Add the following paragraphs*

All overhead sign structures including those carrying DMS, must be designed to accommodate 25% extra sign area than what is called for in the plans. Sign structures must be designed for a minimum sign panel weight of 5 lbs/sf for conventional sign panels and 25% extra dead load for DMS. For conventional (Design-Bid-Build) projects, the DMS dead load and wind area used for the design must be the largest value of any applicable DMS listed on the APL at the time of the design, increased by 25% as previously described. It is anticipated that the worst case dead load and worst case wind area may not come from the same DMS model. For non-conventional (Design-Build) projects, the designer should document the exact DMS model to be used and must design for a 25% increase of that model's weight and area. The requirements for minimum and future sign panels in Structures Manual Volume 3 also apply. If 125% of the proposed panel area is less than the Volume 3 minimum area, the Volume 3 minimum area should be used. If signs are not present over lanes, the Volume 3 minimum area should be used. Refer to TPPPH Section 2.10 for the requirements of minimum vertical clearance.

The designer is responsible to determine the dimensions of the 125% panel that will create the worst case loading scenario. For historical documentation, a note must be added to each sign structure cross-section and to the structural Table of Variable notes that the design accounts for the 25% increase in area. For DMS, plan notes should denote the design assumptions of weight and area.

Application of the 25% extra area and weight is not required when analyzing existing sign structures for re-use.

The designer should verify that the sign panel size conforms to the FDOT Standard Index drawings with regards to vertical hangers, wind beams and luminaire arms. If not, special design and details should be provided in the S&PM plans.

When possible, avoid truss depths greater than 8-ft (96"). Deep trusses pose additional inspection issues.

For bridge mounted sign structures, connection to the traffic railing barrier should be avoided where possible. If it is absolutely necessary to connect to the barrier, the point of connection should be as close to the top of deck as possible.

## **29.5 ITS Support Structures**

*Add the following paragraph*

For projects that involve the re-use of existing sign structures carrying DMS signs, at a minimum, existing U-bolts which connect the truss chords to the upright must be replaced with high-strength U-bolts. Also refer to 29.2.4 and 29.2.5 for additional TPPPH requirements.

## Chapter 30

### Retaining Walls

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

#### 30.3 Retaining Wall Plans Submittal Procedures

*Add the following paragraph*

If any wall system is proposed to be connected to an existing MSE wall, and the existing soil reinforcement are required to provide resistance for that new wall, the design life of the existing wall system must be analyzed to provide full design life of a new wall. This analysis must be submitted for review with the Phase III submittal (or 90% Plans). Internal and external wall stability analyses must use the lowest soil friction angle, as determined by direct shear tests following FM 3-D3080 to model existing MSE wall backfill. This requirement applies to both conventional and non-conventional projects.

## **Chapter 31**

### **Geosynthetic Design**

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

*No changes to the entire chapter*

## Chapter 32

### Noise Walls and Perimeter Walls

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

#### 32.3 Noise Abatement Criteria

*Add the following paragraphs*

Maintenance access points must be provided for noise barriers constructed along the Turnpike. The spacing between openings or the ends of the noise barrier must be no greater than one-half mile. Consultants must coordinate all maintenance openings with the FTE Project Manager and the FTE Maintenance Department. Refer to the Noise Wall Maintenance Access Guide Drawings for acceptable access opening types and example details of maintenance doors. Please note that the Design Consultant is responsible for the final Control Drawings and all details required for the proposed openings.

If a Design Phase Noise Study Report proposes a Traffic Railing/Noise Wall where tapers and attenuators have not been included, the station limits must be extended to account for any tapers or attenuators introduced in final design due to the requirements of the FDOT Design Standards. This applies to individual Traffic Railing/Noise Walls and also where an overlap with another parallel noise barrier is proposed. These changes may require reanalysis due to site specific geometry, and must be approved by the Turnpike Environmental Management Office.

Show the location and limits (Stations and Offsets), including any tapers, for the Traffic Railing/Noise Walls in the Post and Panel Plans. Provide dimensions “D” and “L” depicted in the Noise Wall Maintenance Access Guide Drawings for any proposed access points.

The Noise Wall Maintenance Access Guide Drawings can be found in the following link:

<http://floridasturnpike.com/design/tpph.html>

## **Chapter 33**

### **Reinforced Concrete Box and Three-Sided Culverts**

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

*No changes to the entire chapter*

## **Chapter 34**

### **Monitor Existing Structures**

The following are changes, additions or deletions to the January 2017, Topic #625-000-007, Plans Preparation Manual (PPM), for use on Turnpike projects only.

*No changes to the entire chapter*