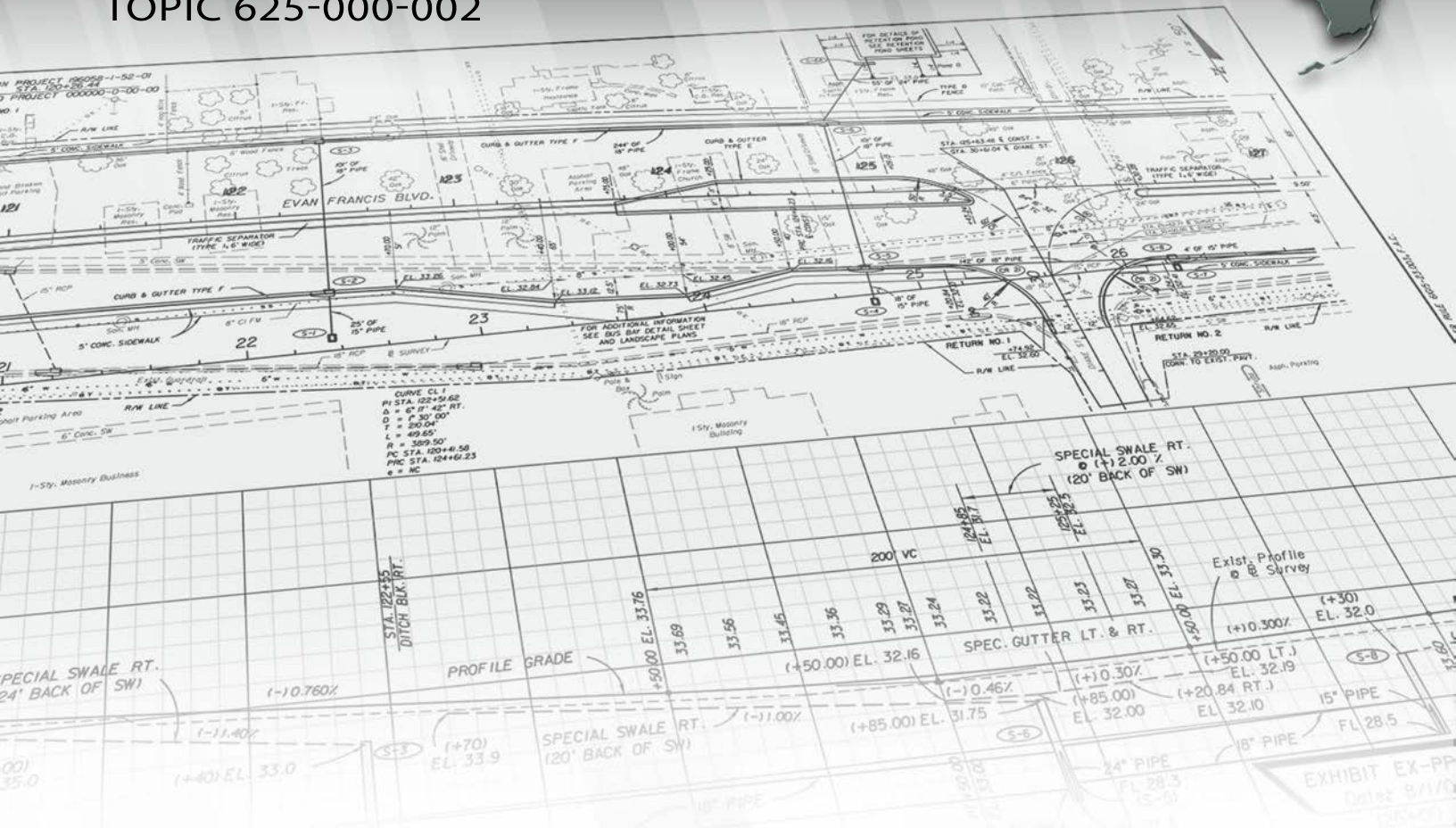


# FDOT DESIGN MANUAL

## DEVELOPMENT AND PROCESSES

TOPIC 625-000-002



JANUARY 2018

## 100 Introduction

### FDOT Design Manual

#### **PURPOSE:**

This *Florida Department of Transportation (FDOT) Design Manual (FDM)*, sets forth geometric and other design criteria, as well as procedures, for FDOT projects. The information contained herein applies to the preparation of contract plans for roadways and structures.

#### **AUTHORITY:**

Sections 20.23(3)(a) and 334.048(3), Florida Statutes.

#### **SCOPE:**

This procedure impacts anyone preparing roadway and structures construction plans for the Department.

#### **PROCEDURE:**

The criteria in this manual represent requirements for the State Highway System which must be met for the design of FDOT projects unless approved Design Exceptions or Design Variations are obtained in accordance with procedures outlined in this manual.

Roadway and structures design is primarily a matter of sound application of acceptable engineering criteria and standards. While the criteria contained in this manual provide a basis for uniform design practice for typical roadway design situations, precise standards which would apply to individual situations must rely on good engineering practice and analyses.

Special requirements for Non-Conventional Projects, e.g., Design-Build Projects and all Non-Design-Bid-Build Public-Private-Partnership Projects, may be shown in a "Modification for Non-Conventional Projects" box as shown in the following example:



Modification for Non-Conventional Projects:

Delete **FDM 230.2.6** and replace with the following:

### **230.2.6 Signing Project Coordination**

The Design-Build firm must submit a master signing plan with the Technical Proposal. The master signing plan can be on a roll plot.

These boxes are located at the beginning of the chapter or after a section, paragraph or table which is to be modified. The requirements listed within these boxes are only applicable to Non-Conventional Projects.

The Author of a Request for Proposal (RFP) for a Non-Conventional project must use the standard boilerplate language as a starting point in developing RFPs on all Department Design-Build projects. **Section V** of the **Design-Build Boilerplate** establishes Department, FHWA and AASHTO criteria, procedures, guidelines and design codes that serve as design constraints to be used in the performance of the work. The governing regulations list in **Section V** cannot be modified without the approval of the State Construction Office. The standard boilerplate language is available at the FDOT Construction Office website:

<http://www.fdot.gov/construction/DesignBuild/DBDocuments/DBDocsMain.shtm>

Pre-scoping questions have been developed to aid in the establishment of project constraints and requirements to be included in the RFP. The Pre-scoping questions can be found at:

<http://www.fdot.gov/construction/DesignBuild/DBRules/DBRulesMain.shtm>

Situations will exist where these criteria will not apply. The inappropriate use of and adherence to these criteria does not exempt the engineer from the professional responsibility of developing an appropriate design. The engineer is responsible for identifying those criteria which may not apply to a particular design, and for obtaining the necessary Design Exception or Design Variation to achieve proper design.

## 1. ORGANIZATION

### Background

The **FDM** is replacing the Plans Preparation Manual (PPM) that has circulated since January 1998.

### Organization

The **FDM** is a three-part manual. **Part 1** contains development and processes, **Part 2** contains design criteria, and **Part 3** contains material concerning plans preparation and assembly.

## 2. DISTRIBUTION

This document is available electronically on the FDM web page:

<http://www.fdot.gov/roadway/FDM/>

**FDM** users can register to receive notification of updates and **Roadway Design Bulletins** online through the Department's Contact Management Database at:

<https://www2.dot.state.fl.us/contactmanagement/Utilities/>

For information on updates and **Roadway Design Bulletins**, contact:

Roadway Design Office, Mail Station 32

Telephone (850) 414-4310

FAX Number (850) 414-5261

<http://www.fdot.gov/roadway/>

## 3. REVISIONS AND UPDATES

**FDM** users are encouraged to submit comments and suggestions for changes to the manual to the State Roadway Design Office. When ideas or suggestions are received they will be reviewed by appropriate Roadway or Structures Design staff in a timely manner and will be coordinated with other offices affected by the proposed change. Items warranting immediate change will be made with the approval of the State Roadway Design Engineer and/or State Structures Design Engineer in the form of a **Design Bulletin**.

**Roadway Design Bulletins** are numbered based on the two digit calendar year and bulletin number (YY- ##). Notices are sent to all users who are registered to

receive notifications for **Roadway Design Bulletins** and updates to the **FDM**. Design Bulletins affecting the **FDM** will remain effective until either:

1. An official manual revision is published; or
2. The **Design Bulletin** is made void.

Roadway Design Bulletins are posted online at:

<http://www.fdot.gov/roadway/bulletin/>

Structures design issues, which are subject to modification and revision, will be processed in coordination with the State Structures Design Office. See the [Structures Manual](#) for more information on this process.

Proposed revisions are distributed in draft form to each District's Roadway Design Engineer or Structures Design Engineer. These experienced engineers provide the necessary technical and practical input on how the revision will potentially affect their District's operations and customers. Periodically, these engineers meet collectively with the State Roadway Design Office or the State Structures Design Office to discuss comments on the proposed revisions. Proposed revisions with comments are then presented to the District Design Engineers (DDE) for review and comment. Once the comments are addressed, the Florida FHWA Division Office is given the opportunity to review the revisions as per the Department's Stewardship Agreement with FHWA.

The State Roadway Design Office will also coordinate proposed revisions or additions with affected offices within the Central Office. Substantive revisions that result in policy change may be coordinated with the Executive Committee for adoption.

Revisions and updates are adopted or rejected by the State Roadway Design Engineer (for Roadway Design issues) or the State Structures Design Engineer (for Structures Design issues). Requirements mandated by FHWA or State Rules will be coordinated with the DDEs and affected offices within the Central Office and are considered compulsory.

Notification of the adopted revisions and addenda will be distributed to registered users of the manual through the Department's Contact Management Database.

## **TRAINING:**

None required.

## **FORMS:**

All forms related to this manual are found in ***FDM 103***.



## 102 Glossary of Terms

### 102.1 General

The following definitions used in the FDOT Design Manual (FDM) are assigned for consistency of understanding and interpretation of the processes and criteria contained within. These definitions may not be consistent with AASHTO, MUTCD, NCHRP or other documents referenced in this manual. When definition of terms conflict with other FDOT manuals, use the definitions provided in this chapter.

#### 102.1.1 FDM Definitions

- (1) **Access Classification:** A classification of a roadway that determines the standards to apply to the design of medians, median openings, connections and signal spacing. See **FDM 200** for additional information.
- (2) **AADT:** Annual Average Daily Traffic (AADT), is the total volume of vehicle traffic of a roadway for a year divided by 365 days.
- (3) **Arterial:** Divided or undivided roadways that provide continuous routes which serve through traffic, high-traffic volumes, and long average trip lengths. Arterials include expressways without full control of access, US numbered highways and principal state roads that connect cities and towns. Arterials are further classified by context.
- (4) **As-Built Plans:** The Contract Plans after construction is completed, all revisions including those occurring during construction, have been included and with the title on the key sheet changed to Final Plans.
- (5) **Auxiliary Lane:** The designated widths of roadway pavement marked to separate speed change, turning, passing and weaving maneuvers from through traffic. They may also provide short capacity segments.
- (6) **Bicycle Lane:** A bicycle lane (bike lane) is a portion of a curbed roadway which has been designated by striping and special pavement markings for use by bicyclists.
- (7) **Bicycle Way:** Any road, path or way which by law is open to bicycle travel, regardless of whether such facilities are signed and marked for the preferential use by bicyclists or are to be shared with other transportation modes. Examples include bicycle lanes, paved shoulders, shared use paths, and traffic lanes.

- (8) **C-D Road:** Collector-Distributor Roads are limited access roadways provided within a single interchange, or continuously through two or more interchanges on a freeway segment. They provide access to and from the freeway, and reduce and control the number of ingress and egress points on the through freeway. They are similar to continuous frontage roads except that access to abutting property is not permitted.
- (9) **Collector:** Divided or undivided roadway which serves to link arterials with local roads or major traffic generators. They serve as transition link between mobility needs and land use needs. Collectors may include minor state roads, major county roads, and major urban and suburban streets. Collectors on the SHS are further classified by context.
- (10) **Context Classification:** Description of the land use and transportation context where a roadway is found. Roadways are designed to match the characteristics and demands defined by the appropriate Context Classification criteria. See *FDM 200* for additional information.
- (11) **Conventional Project:** Projects for which the preparation of the contract documents is a 'stand-alone' effort resulting in Plans, Specifications and Estimates (PS&E) package that is advertised for a Construction Contract. These projects are often referred to as "design-bid-build" projects.
- (12) **Express Lanes:** An express lane is a type of managed travel lane physically separated from general use lanes, or general toll lanes, within a roadway corridor. Express lanes use dynamic pricing through electronic tolling in which toll amounts are set based on traffic conditions
- (13) **Freeway:** The terms Freeway, Interstate, Toll Road and Expressway are often used synonymously when establishing criteria within this manual. A Freeway is a divided highway that provides full control of access (i.e. Limited Access) and is intended for long distance trips. Interstate is a federally funded network of freeways that must meet national design criteria and operational standards. Toll Road is a general term for any road that requires the user to pay to use all or a portion of the road. Expressways are freeways situated in major metropolitan areas with primary service for commuters; and may or may not be tolled. Movement of traffic, free of interference and conflicts, is of primary importance for these types of facilities. Essential elements include medians, grade separations, interchanges, and, in some cases, collector-distributor roads and frontage roads. Freeways may be further classified as rural, urban or urbanized.
- (14) **General Use Lane:** Any untolled traffic lane that is not set aside for a specific purpose such as Express lanes.

- (15) **Grade Separation:** A crossing of two roadways, or a roadway with a railroad or pedestrian pathway, at different levels.
- (16) **High Speed:** Design Speeds 50 mph and greater.
- (17) **Highway:** A highway is a high speed roadway (divided or undivided) intended for travel between destinations like cities and towns.
- (18) **HOV Lane:** Special designated travel lanes reserved for high occupancy vehicles (HOV); e.g. buses and car pool vehicles. They may be adjacent to general use lanes or separated.
- (19) **Intersection:** Intersection types can be categorized by intersection basic type, functional classification, control type, area type, or a combination of these classifiers, depending on the element of design.
- (20) **Local Agency Funding Agreement:** An agreement used when Local Agencies provide funds to the Department for a specific project, often that are not on the State Highway System. This funding needs to be documented with an Agreement that should include provisions for additional funding for contingency. These Agreements must be coordinated through the Comptroller's office and is covered by procedure locally funded agreements (non-PTO) – financial provisions and processing (**Topic Number: 350-020-300-n**).
- (21) **Local Road:** Roadways which provide high access to abutting property, low average traffic volumes, and short average trip lengths. Local roads may include minor county roads, minor urban and suburban subdivision streets, and graded or unimproved roads.
- (22) **Low Speed:** Design Speeds of 45 mph and less.
- (23) **Low Volume and High Volume:** Descriptive terms used to describe certain operating characteristics and driver expectancy on highways. Standards for these controls are based on area type and are given in **Table 102.1.1**.

**Table 102.1.1 AADT Thresholds for Low and High Volume Roadways**

Facility	Urban		Rural	
	Low Volume AADT	High Volume AADT	Low Volume AADT	High Volume AADT
<b>Freeway</b>				
4-Lane Facility	57,000	69,000	46,000	56,000
6-Lane Facility	86,000	103,000	69,000	83,000
8-Lane Facility	114,000	138,000	92,000	111,000
<b>Arterial</b>				
2-Lane Facility	16,000	20,000	9,000	14,000
4-Lane Facility	37,000	43,000	38,000	47,000
6-Lane Facility	55,000	64,000	58,000	71,000
8-Lane Facility	69,000	80,000	--	--
<b>Collector</b>				
2-Lane Facility	11,000	16,000	8,000	13,000
4-Lane Facility	37,000	45,000	30,000	38,000
<p><b>LOW VOLUME ROADWAYS:</b> Design Year AADT is <math>\leq</math> low volume AADTs shown.</p> <p><b>HIGH VOLUME ROADWAYS:</b> Design Year AADT is <math>\geq</math> high volume AADTs shown.</p>				

- (24) **Maintenance Agreement:** An agreement with a Local Agency for the maintenance responsibilities of a federally funded project. This agreement is required for construction projects let by FDOT for work not on the State Highway System and must be obtained prior to the authorization for construction of the project.
- (25) **Match Existing:** This term is used when the construction a proposed element (e.g. roadway, sidewalk, striping) may need to be adjusted at the termini to harmonize with the existing element being connected to. For Resurfacing Projects, this term is used when the existing pavement cross slopes are not intentionally modified or changed; i.e. applicable to constant depth milling and resurfacing.



- (26) **Paratransit:** Comparable transportation service required by the American with Disabilities Act (ADA) for individuals with disabilities who are unable to use fixed route transportation systems. The specific requirements and parameters for this service, including eligibility and service requirements, are contained in 49 CFR Part 37, Subpart F.
- (27) **Pedestrian Access Route:** A continuous and unobstructed path of travel provided for individuals with disabilities within or coinciding with a pedestrian way.
- (28) **Pedestrian Way:** A space for pedestrian travel separated from traffic lanes. Sidewalks, shared use paths, footpaths and shoulders are considered to be pedestrian ways; however, footpaths and shoulders are not Pedestrian Access Routes, since they lack specific improvements or provisions to accommodate persons using mobility aids.
- (29) **Projects of Division Interest (PoDI):** PoDIs are projects that have an elevated risk, contain elements of higher risk, or present a meaningful opportunity for FHWA involvement to enhance meeting program or project objectives. Project selection is risk-based. Stewardship and oversight activities will be directed toward addressing identified risks. This may include retaining certain project approvals, where permissible, or directing stewardship or oversight activities to a specific phrase or element of the project. Additional information is included in **FDM 125**.
- (30) **Production Date:** The committed completion date for final plans (as described in **FDM 301.2.5**) and Certifications (e.g., utilities, permits, R/W, environmental). Marks the date that the project is ready for the Plans, Specifications, and Estimates (PS&E) Submittal(s).
- (31) **Ramp:** A turning roadway that connects a Freeway to a crossing roadway within an interchange. The components of a ramp are a terminal at each leg and a connecting road. The geometry of the connecting road ramp usually involves some curvature and a grade.
- (32) **Roadway:** Roadways consist of prepared surfaces (asphalt or concrete pavement) for use by vehicles, including shoulders and adjacent bicycle lanes. A divided roadway provides a separation between opposing traffic lanes.
- (33) **Rural (area type):** Places outside the boundaries of concentrated populations that accommodate higher speeds, longer trip lengths and freedom of movement, and are relatively free of street and highway networks.
- (34) **Shoulder Break:** Point of intersection of the shoulder slope plane and the embankment or ditch slope plane; i.e. where the full-width shoulder slope of 0.05 or 0.06 “breaks” to a front slope of 1:x.

- (35) **Strategic Intermodal System (SIS):** A transportation system comprised of facilities and services of statewide and interregional significance, including appropriate components of all modes. The highway component includes all designated SIS Highway Corridors, Emerging SIS Highway Corridors, SIS Intermodal Connectors, and Emerging SIS Highway Intermodal Connectors.
- (36) **Streets:** The local system which provides direct access to residential neighborhoods and business districts, connects these areas to the higher order road systems and offers the highest access to abutting property; sometimes deliberately discouraging through-traffic movement and high speeds.
- (37) **Traffic Lane:** The terms Traffic Lane and Traveled Way are often used synonymously within this manual. A traffic lane is the designated portion of a roadway intended to carry motorized traffic, exclusive of shoulders and bicycle lanes. Traffic lanes include travel lanes and auxiliary lanes.
- (38) **Travel Lane:** A travel lane is the designated portion of a roadway intended to carry motorized through traffic. Generally, travel lanes equate to the basic number of lanes for a facility; e.g. 4-lane divided highway.
- (39) **Truck Traffic:** Truck traffic is sometimes used as a qualifying control. Truck traffic is expressed as a percent of the AADT or daily count (24 hr.).
- (40) **Urban (area type):** A geographic region comprising as a minimum the area inside the United States Bureau of the Census boundary of an urban place with a population of 5,000 or more persons, expanded to include adjacent developed areas as provided for by Federal Highway Administration (FHWA) regulations. The FHWA Urban Boundary maps are available online at:  
  
<http://www.fdot.gov/roadway/BufferMaps/Default.shtm>
- (41) **Urbanized (area type):** A geographic region comprising as a minimum the area inside an urban place of 50,000 or more persons, as designated by the United States Bureau of the Census, expanded to include adjacent developed areas as provided for by Federal Highway Administration regulations. Urban areas with a population of fewer than 50,000 persons which are located within the expanded boundary of an urbanized area are not separately recognized.
- (42) **Very Low Speed:** Design Speeds 35 mph and less.

## 103 Standard Forms

### 103.1 General

This chapter contains fillable portable document format (PDF) of the standard forms found in the FDOT Design Manual (**FDM**). The form number assigned to each form corresponds to the **FDM** chapter in which it is discussed. Refer to the related chapter for instruction on the use of each form.







**Certification Statement:**

I certify that the component plans listed in this letter have been verified by independent review and are in compliance with all requirements presented in the Contract Documents. Independent Peer Review comments and comment resolutions have been included in this submittal under separate cover.

Please do not hesitate to contact me if you have any questions.

Name of Independent Peer Review Firm \_\_\_\_\_

Name of Independent Peer Reviewer \_\_\_\_\_

Title \_\_\_\_\_

Signature \_\_\_\_\_

Florida Professional Engineer Lic. No. \_\_\_\_\_

**Certification Letter**

Florida Department of Transportation  
District \_\_\_\_\_

Attn:

**Reference: Independent Peer Review Category 2 Structures**  
**Financial Project ID:**  
**Federal Aid Number:**  
**Contract Number:**

**Submittal: 100% Bridge Submittal Plans**  
**Bridge Number(s):**

Dear \_\_\_\_\_,

Pursuant to the requirements of the Contract Documents,  
\_\_\_\_\_ hereby certifies that an independent peer review of the above-referenced  
submittal has been conducted in accordance with FDM 121 and all other governing  
regulations. Component plans that were included in the peer review are as follows:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Certification Statement:**

I certify that the component plans listed in this letter have been verified by independent review,  
that all review comments have been adequately resolved, and that the plans are in compliance  
with all Department and FHWA requirements presented in the Contract Documents.

Please do not hesitate to contact me if you have any questions.

Name of Independent Peer Review Firm

Name of Independent Peer Reviewer

Title

Florida Professional Engineer Lic. No.

*[Insert Signature,  
Date and Seal  
here.]*

# SUBMITTAL/APPROVAL LETTER

To: \_\_\_\_\_  
District or Turnpike Design Engineer

Date: \_\_\_\_\_

Financial Project ID: \_\_\_\_\_ New Const. RRR

Federal Aid Number: \_\_\_\_\_

Project Name: \_\_\_\_\_

State Road Number: \_\_\_\_\_ Co./Sec./Sub. \_\_\_\_\_

Begin Project MP: \_\_\_\_\_ End Project MP: \_\_\_\_\_

FHWA Project of Division Interest: Yes No

Request for: Design Exception Design Variation  
Community Aesthetic Feature: Conceptual Final

Re-submittal: Yes No Original Ref# \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_

Requested for the following element(s):

Design Speed	Lane Width	Shoulder Width	Cross Slope
Design Loading Structural Capacity	Vertical Clearance	Maximum Grade	Stopping Sight Distance
Superelevation	Horizontal Curve Radius	Other _____	

**Recommended by:**

\_\_\_\_\_ Date \_\_\_\_\_

**Approvals:**

\_\_\_\_\_ Date \_\_\_\_\_

\_\_\_\_\_ Date \_\_\_\_\_

\_\_\_\_\_ Date \_\_\_\_\_

\_\_\_\_\_ Date \_\_\_\_\_

\_\_\_\_\_ Date \_\_\_\_\_

\_\_\_\_\_ Date \_\_\_\_\_



**Design Plans Phase Review**

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

TO: \_\_\_\_\_

FROM: \_\_\_\_\_

COPIES: \_\_\_\_\_

SUBJECT: Response to \_\_\_\_\_ Phase Review

REF:	Financial Project ID	_____
	FA Project Number	_____
	County	_____

APPROVED:

CONCURRENCE:

\_\_\_\_\_  
 Responsible Professional Eng.  
 (Name of Consultant Firm)

- \_\_\_\_\_  
 \* District Design Engineer  
 \* District Structures Design Engineer  
 \* District Project Management Engineer

\* As appropriate

**Design Plans Component Review**

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

TO: \_\_\_\_\_

FROM: \_\_\_\_\_

COPIES: \_\_\_\_\_

SUBJECT: Response to \_\_\_\_\_ Component Review

REF: Financial Project ID \_\_\_\_\_  
FA Project Number \_\_\_\_\_  
County \_\_\_\_\_

APPROVED:

CONCURRENCE:

\_\_\_\_\_  
Responsible Professional Eng.  
(Name of Consultant Firm)

- \* District Design Engineer
- \* District Structures Design Engineer
- \* District Project Management Engineer

\* As appropriate

## Special Provisions

DATE:

TO:

FROM:

COPIES:

SUBJECT:

REF:       Financial Project ID  
            FA Project Number  
            County

APPROVED:

CONCURRENCE:

Responsible Professional Eng.  
(Name of Consultant Firm)

\* District Design Engineer  
\* District Structures Design Engineer  
\* District Project Management Engineer

\* As appropriate

## INITIAL MEETING CHECKLIST

### Basic information about the project

Project Location	Jurisdiction(s) in which the Project is Located
Project Limits	Proposed Change in Lane Configuration
Project Length	Project Schedule
Project Purpose	

This is a list of items that the Applicant should be prepared to discuss at the Initial Meeting:

Conceptual plan (including transitions to and from the lane elimination section)	Anticipated changes (if any) in functional classification and access management classification
Existing and long-range future AADT (the latter based on historical growth and/or the regional travel demand model)	Anticipated changes (if any) in posted speed limits
Consistency of the proposed project with the applicable Long-Range Transportation Plan (LRTP), Transportation Improvement Program (TIP), Transit Development Plan (TDP), comprehensive plan, and any applicable master plans, visions, and Complete Streets initiatives	Need for design variations or design exceptions to support the lane elimination project
Status of the roadway as an Evacuation Route, freight route, and/or part of the Strategic Intermodal System (SIS)	Plan for obtaining input and review from businesses, residents, and other stakeholders
Status of the roadway as a major transit corridor per the LRTP or TDP	Plan for receiving endorsement from elected officials
Proposed use(s) for the right-of-way after lanes are eliminated (e.g., widened sidewalks, bicycle lanes, landscaping, on-street parking, transit lanes)	Ideas for funding sources
Existing right-of-way width and any proposed changes to the right-of-way width	Potential implementation strategy and partner commitments
Anticipated changes (if any) in jurisdictional responsibility for ownership or maintenance of the roadway	

## Methodology Checklist

This is an illustrative list of items that the District Review Team might require the Applicant to address in a Concept Report:

- Conceptual design plans (including proposed typical sections) that meet FDOT design standards for all transportation modes
- Need for any design variations or exceptions
- Size of impact area
- Near- and long-range traffic forecasts with and without the proposed (with changes in travel patterns clearly shown)
- Near- and long-range level of service (LOS) and queuing analysis for intersections and segments in the impact area under the build and no-build scenarios
  - LOS analyses may be daily or peak hour analyses at the District Review Team's discretion.
  - The District Review Team and the Applicant should agree on an analysis methodology.
- Mitigation to address significant and adverse LOS impacts on State roads and the regional transportation system resulting from the lane elimination
- Impact on pedestrian and bicycle infrastructure (e.g., sidewalks, bicycle lanes, and multi-use paths) and connectivity
- Impact on transit routes and/or transit stops locations (including appropriateness of turn radii and lane widths)
- Impact on parking supply
- Crash data summary and analysis, which may include identification of high-crash locations (by crash type) and locations on FDOT's 5% lists (i.e., the lists of the 5% of segments and intersections with the highest number of crashes) and/or estimation of the potential increase or decrease in crashes using Crash Modification Factors (CMFs) from the Highway Safety Manual, CMFs from the Federal Highway Administration CMF website, or other appropriate methodologies
- Impact on trucks and designated truck routes (including appropriateness of turn radii and lane widths and possible relocation of designated truck routes)
- Impact on evacuations routes and emergency response
- Conceptual funding plan (includes cost estimates and funding sources)
- Conceptual implementation plan (including an implementation schedule and a list of the commitments that the applicant will make in support of the lane elimination project)
- Existing posted speed and desired posted speed after the lane elimination
- The need to add, remove, or modify traffic signals
- Impacts on school crossing locations and/or midblock pedestrian crossing locations
- Case-specific special considerations to be determined (e.g., railroad crossing improvements)

**Lane Elimination  
Initial Notice to Central Office**

**FORM 126-C**

To: \_\_\_\_\_ From: \_\_\_\_\_ Date: \_\_\_\_\_  
*Systems Management Manager*

The intent of this message is to inform Central Office that District \_\_\_\_\_ has received a request for lane elimination on a State Highway.

**PROJECT INFORMATION**

State Road: \_\_\_\_\_

Project Location: \_\_\_\_\_

Project Limits (MP): From \_\_\_\_\_ to \_\_\_\_\_

Applicant: \_\_\_\_\_

Project Description: \_\_\_\_\_

Project Purpose: \_\_\_\_\_

Proposed Change in Cross Section: From \_\_\_\_\_ lanes to \_\_\_\_\_ lanes

SIS       NHS

**ACTIONS AND OUTCOMES TO DATE**

District staff participated in a meeting with \_\_\_\_\_ on \_\_\_\_\_ to formally commence the lane elimination review process. At that meeting, District staff provided an overview of the lane elimination review process and the Applicant shared initial information about the lane elimination project. The District determined the specific review process and analysis methodology for the lane elimination request.

**NEXT STEPS**

The Applicant will submit a Draft Concept Report (containing a proposed typical section) as the lane elimination review process proceeds. If the District reviewers find the Draft Concept Report acceptable, the District will recommend that the Applicant submit a formal Application Package (including the Final Concept Report). If the Application Package is complete and acceptable, the District will approve the lane elimination request with the concurrence of Central Office.

**Concurrence:**

\_\_\_\_\_  
District Design Engineer

Date: \_\_\_\_\_

\_\_\_\_\_  
District Traffic Operations Engineer

Date: \_\_\_\_\_

## Lane Elimination Final Review and Approval Notice to Central Office

The intent of this message is to inform Central Office that District \_\_\_\_\_ has received a request for lane elimination on a State Highway.

**PROJECT INFORMATION**

State Road: \_\_\_\_\_

Project Location: \_\_\_\_\_

Project Limits (MP): From \_\_\_\_\_ to \_\_\_\_\_

Applicant: \_\_\_\_\_

Project Description: \_\_\_\_\_

\_\_\_\_\_

Project Purpose: \_\_\_\_\_

Proposed Change in Cross Section: From \_\_\_\_\_ lanes to \_\_\_\_\_ lanes

SIS       NHS

**District Approvals:**

\_\_\_\_\_  
District Design Engineer

Date: \_\_\_\_\_

\_\_\_\_\_  
District Traffic Operations Engineer

Date: \_\_\_\_\_

**Concurrence:**

\_\_\_\_\_  
Chief Planner

Date: \_\_\_\_\_

**Final Approval:**

\_\_\_\_\_  
Chief Engineer

Date: \_\_\_\_\_

## 18 KIP Equivalent Single Axle Loads (ESAL)

Financial Project ID \_\_\_\_\_

State Road No. \_\_\_\_\_

County \_\_\_\_\_

I have reviewed the 18 KIP Equivalent Single Axle Loads to be used for pavement design on this project. I hereby attest that these have been developed in accordance with the FDOT **Project Traffic Forecasting Procedure** using historical traffic data and other available information.

\_\_\_\_\_  
Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Organizational Unit

\_\_\_\_\_  
Date



## Project Traffic

Financial Project ID \_\_\_\_\_

State Road No. \_\_\_\_\_

County \_\_\_\_\_

I have reviewed the Project Traffic to be used for design on this project. I hereby attest that it has been developed in accordance with the FDOT **Project Traffic Forecasting Procedure** using historical traffic data and other available information.

\_\_\_\_\_  
Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Organizational Unit

\_\_\_\_\_  
Date

TRANSMITTAL OF PLANS, SPECIFICATIONS AND ESTIMATES PACKAGE

Date: \_\_\_\_\_ 30 Day AD  60 Day AD 
Proposal/Contract ID: \_\_\_\_\_ Letting Date: \_\_\_\_\_ Re-Let:  No  Yes
Financial Project ID(s): \_\_\_\_\_
County: \_\_\_\_\_ State Road No.: \_\_\_\_\_
Federal Funds:  No  Yes Federal Aid No.: \_\_\_\_\_
Total Roadway Length: \_\_\_\_\_ Total Bridge Length: \_\_\_\_\_
Total Project Length: \_\_\_\_\_ Total Project Length Verified by: \_\_\_\_\_
Project Manager Name and Phone Number: \_\_\_\_\_
E.O.R. Name, Firm and Phone Number: \_\_\_\_\_
Work Mix No. \_\_\_\_\_ Work Mix Description: \_\_\_\_\_

On \_\_\_\_\_, the District Director of Transportation Development (Production) certified that the Plans, Specifications and Estimates (PS&E) Package is complete, has no known errors or omissions, has been reviewed for constructability and biddability, and is ready to be advertised for construction.

The following items transmitted as noted:

SEALED PLANS SET ( \_\_\_\_\_ SHEETS), SPECIFICATIONS PACKAGE ( \_\_\_\_\_ PAGES): The Electronic Bid Set was reviewed by \_\_\_\_\_ and posted to the server on \_\_\_\_\_.

ESTIMATES OFFICE INFORMATION:

The Authorization Estimate, will be reviewed by District Estimates and posted to the server by the PS&E submittal due date. At the time of posting, transfer control of the project files to Central Office.

FEDERAL AID OFFICE INFORMATION:

Federal Aid Oversight:  No  Yes
FHWA: Approved by \_\_\_\_\_ Date: \_\_\_\_\_
Print Name of FHWA Engineer

CONTRACTS OFFICE INFORMATION:

Contract Time: \_\_\_\_\_ Calendar Days
Select One:
 Standard Acquisition Time: 15 Days
 Other Acquisition Time: \_\_\_\_\_ Days (Approval required if more than 120 Days)
 Flexible Start Time: \_\_\_\_\_ Days (Approval required if more than 120 Days)
 Special Start Date: \_\_\_\_\_ (Approval required for SP0080303B and SP0080303C)
Wage Rate(s) \_\_\_\_\_
Business Development Initiative Project:  No  Yes
Alternative Contracting:  No  Yes
(If yes, Type: \_\_\_\_\_)
Pre-Bid Conference Mandatory?  No  Yes (Date: \_\_\_\_\_ Time: \_\_\_\_\_ A.M./P.M.)
(Contact Person and Phone: \_\_\_\_\_)
(Location of Conference: \_\_\_\_\_)

SPECIAL NOTES and REQUIREMENTS (List/Explain): \_\_\_\_\_
\_\_\_\_\_
\_\_\_\_\_
\_\_\_\_\_

If any items are missing please contact \_\_\_\_\_
Contact Name and Phone Number

**Transmittal of Plans, Specifications and Estimates Package  
Sheet 2 of 2**

**REMINDER**

1. Check that all components of the Contract Plans are included as listed on the lead key sheet.
2. Check that all sheets are included according to key sheet indices.
3. Check that all sheets have the correct Financial Project ID.
4. Check that all sheets are legible and reproducible.
5. On strung projects, check that all Summary of Pay Item sheets from the Proposal/Contract ID go in the lead project and the Financial Project ID of the strung project is shown on the lead key sheet.
6. Check that bridge pay item sheets show bridge numbers and the quantity breakdowns.
7. E-mail the Transmittal Memo, Contract File Index and attachments to the group "CO-CPKG" and copy the FDOT Project Manager.
8. Verify the accuracy, in the FM system, of the Description, Project Limits, Mileage and Structures. Initial Total Project Length Verification.

**Special Notes and Requirements:**

- A. Provide the Roadway, Bridge, and Project Lengths in miles, rounded to three decimal places as follows:
  - Total Roadway Length = End Project - Begin Project - Exceptions - Bridges (not including bridge culverts) adjusted for Equations
  - Total Bridge Length = Sum of all End Bridge – Begin Bridge (not including bridge culverts)
  - Total Project Length = Roadway + Bridges
- B. Include the Work Mix Number and Work Mix Description corresponding to the information as shown in the Financial Management System on the WP01 Screen
- C. Anything that affects the advertisement, bidding and award that is not listed above such as:
  - a. Railroad Insurance
  - b. Developmental Specifications
  - c. Alternative Contracting items such as Scope Alternates
  - d. Budgetary Ceilings
  - e. Additional Insured Endorsement partiesFor A+B projects, include the User Cost Per Day \$\_\_\_\_\_ and Maximum Days \_\_\_\_\_.

### CONTRACT FILE INDEX

Financial Project ID \_\_\_\_\_ Proposal/Contract ID \_\_\_\_\_

ATTACHMENTS (check if included or list expected date of transmittal to Central Office)

- \_\_\_\_\_ Calendar Days Recommendation
- \_\_\_\_\_ Preliminary Engineering Certification\*
- \_\_\_\_\_ Utility Certification
- \_\_\_\_\_ Status of Environmental Certification Form
- \_\_\_\_\_ Permit Transmittal Memo\*\*
- \_\_\_\_\_ Railroad Clear Letter
- \_\_\_\_\_ FDOT/FGT Encroachment Agreement
- \_\_\_\_\_ Certificate for Construction (**Form 575-095-05**)
- \_\_\_\_\_ Executed copy of MMOA for Projects with Patterned Pavement
- \_\_\_\_\_ Approval if SP0080701B Computation of Contract Time is used.
- \_\_\_\_\_ Landscape Exception Approval per Engineering and Operations Memorandum 13-1

- No  Yes Project is Project of Division Interest under agreement dated August 20, 2015\*
- No  Yes Right of Way Certification was mailed to State R/W Administrator
- No  Yes  N/A Local Funds Agreement sent to Office of Comptroller
- No  Yes  N/A Local Funds Sent to Office of Comptroller
- No  Yes  N/A Project is Federally Funded off the State Highway System, requiring a Maintenance Agreement.  
If yes, a Maintenance Agreement (Number \_\_\_\_\_) was executed on \_\_\_\_\_ . A copy is available upon request.

\* Include if federally funded.

\*\* Must have District Secretary Approval if Permits are not received by Authorization to Advertise (*Federally Funded Projects Only*).

Note: If project is federally funded and has a state funded "Goes With", please provide the same documentation as required for a federally funded project.

Name: \_\_\_\_\_  
Print Name of Project Manager/Other Title

Date: \_\_\_\_\_

## **REMINDER**

### **PROCESS:**

1. Organize attachments in the order listed.
2. Show the number of Maintenance Agreements (Federal funds – off the State Highway System).
3. Show anticipated date of arrival on any item not included in package.
4. The ***Status of Environmental Certification*** must be completed on all federally and state funded projects. For federally funded projects, use the Status of Environmental Certification for Federal Project, Form #650-050-13. For state funded only, non-federal eligible (NFE) projects, use the Status of Environmental Certification for State Funded Project, Form #650-050-14. The District Environmental Office must use the StateWide Environmental Project Tracker (SWEPT) to complete the Status of Environmental Certification Form.

When a federally funded project is strung with a NFE project, the entire project contract becomes federalized; i.e., both the state funded project and the federally funded project must comply with all applicable federal laws, rules, and regulations related to the federalized contract. In addition, the federally funded project is to be the lead project.

Regarding federal environmental compliance under NEPA, the project limits of the approved final environmental document will control the scope of compliance with NEPA requirements. NEPA requirements (including staging areas and Contractors' off-site activities) must only be met for that portion of the project included within the "logical termini" as described in the NEPA document associated with the federally funded portion of the federalized contract.

**NOTE:** The Contract File Index is an integral part of the Transmittal of Plans, Specifications and Estimates Package.

### REVISION MEMO

DATE: \_\_\_\_\_  
 TO: Final Plans (CO-FINALPLANS)  
 FROM: \_\_\_\_\_, Project Manager  
 COPIES: DDE, DCPME  
 SUBJECT: **Revision Number** \_\_\_\_\_ - Letting (mo./yr.) \_\_\_\_\_  
 Financial Project ID \_\_\_\_\_ (Lead number only)  
 Proposal/Contract ID \_\_\_\_\_  
 Federal Funds: No Yes Federal Aid No. \_\_\_\_\_  
 County \_\_\_\_\_ State Road No. \_\_\_\_\_

Mandatory Only: No Yes (\*If Yes, Signatures Not Required.)

\*Concurred by: \_\_\_\_\_ Date: \_\_\_\_\_  
Signature of Director of Transportation Development or Designee

I have reviewed for effects on the Specifications Package and a package revision **is**   
**is not**  required. \*Approved By: \_\_\_\_\_ Date: \_\_\_\_\_  
Signature of District Specifications Engineer

If Projects of Division Interest ,

\*Authorized By: \_\_\_\_\_ Date: \_\_\_\_\_  
Print Name of FHWA Engineer

REVISIONS RECEIVED IN THE FINAL PLANS OFFICE WITHIN 15 WORK DAYS  
OF THE LETTING MUST BE APPROVED BY THE DISTRICT SECRETARY.  
NO REVISIONS ALLOWED WITHIN 5 WORK DAYS OF THE LETTING  
WITHOUT APPROVAL.

\*Approved By: \_\_\_\_\_ Date: \_\_\_\_\_  
Signature of District Secretary

- SUPPLEMENTAL SPECIFICATIONS PACKAGE NUMBER \_\_\_\_\_ (\_\_\_\_ Pages).
- REISSUED SPECIFICATIONS PACKAGE \_\_\_\_\_ (\_\_\_\_ Pages).
- PLANS REVISION NUMBER \_\_\_\_\_ (\_\_\_\_ Sheets).

CONTRACT TIME REVISED: No Yes(if yes, \_\_\_\_\_ Total Calendar Days)





## REMINDER

### PROCESS:

1. Fill out headings.
2. Mandatory Only revisions must not have other revisions included to remain exempt from signature requirement.
3. On Projects of Division Interest, get FHWA concurrence as applicable. Print name of FHWA Engineer and date. *(Not required for Mandatory Only Revisions)*
4. Get concurrence signature from the District Director of Transportation Development or designee. *(Not required for Mandatory Only Revisions)*
5. Get signature of the District Specifications Engineer. *(Not required for Mandatory Only Revisions)*
6. Revisions received in the Final Plans Office within 15 work days of the letting must be approved by the District Secretary. *(Not required for Mandatory Only Revisions.)* Notify Final Plans. Revisions within five working days of the letting are not allowed without final approval from the Director of the Office of Design. Since there is no assurance that all prospective contractors will get these documents on time to be considered in their bids, approvals for a revision within five working days of the letting will be rare. If the revision is not approved, the project will either be let as is, or be withdrawn from letting. Withdrawing or moving the project to a later letting after advertisement requires approval by the District Secretary and the Chief Engineer.
7. For Supplemental Specification Packages, fill in the Rev. Date, number of pages and a brief description.
8. Enter the sheet number and:  
Describe new pay item number, Rev. Date with old quantity and new quantity, deleted pay item number only, or revised quantities; by entering pay item number with old and new quantities.
9. On bridges indicate "each bridge number" with corrected changes.
10. If a revision will impact the utility plans, adjustments or schedules, provide a copy of the revision memo and affected plan sheets to the District Utilities Engineer.
11. Any change to any pay item, requires replacement of the entire Proposal Summary of Pay Items.
12. Email the Revision approval to Final Plans Section (CO-FINALPLANS) to unlock the summary of pay items.
13. Email Revision Memo to Final Plans.

### REVISED DOCUMENTS:

1. Revised sealed plans sheets including Summary of Pay Items and Summary of Quantities sheets.
2. Revised District Cost Estimate if federally funded.
3. Revised sealed Supplemental Specifications Package.



MEMORANDUM

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

TO: \_\_\_\_\_, Federal Aid Programs Manager

FROM: \_\_\_\_\_, Design Project Manager

COPIES: \_\_\_\_\_

SUBJECT: **PRELIMINARY ENGINEERING CERTIFICATION** (Federal Aid Projects Only)

Financial Project ID \_\_\_\_\_  
 Proposal/Contract ID \_\_\_\_\_  
 Federal Aid No. \_\_\_\_\_  
 County \_\_\_\_\_  
 Project Description \_\_\_\_\_

Preliminary Engineering (design) was funded with:

- State Funds under  
Financial Project ID \_\_\_\_\_
- Federal Funds authorized under,  
Federal Aid No. \_\_\_\_\_  
Financial Project ID \_\_\_\_\_

The following projects, designed with the same Preliminary Engineering funds, will be strung to (awarded with) the subject project:

Federal Aid No. \_\_\_\_\_, Financial Project ID \_\_\_\_\_,  
 Federal Aid No. \_\_\_\_\_, Financial Project ID \_\_\_\_\_.

The Preliminary Engineering for the subject project is \_\_\_\_ open/ \_\_\_\_ closed. If open,

- it will be closed after PS&E authorization, or
- it is a district wide project. Task order number \_\_\_\_\_ for this project is closed.  
The financial number will be open for other projects.
- it will remain open for additional charges, as follows: \_\_\_\_\_  
\_\_\_\_\_

The FDOT Project Manager may be contacted at (phone): \_\_\_\_\_

**REMINDER**

Under "Preliminary Engineering (design) was funded with:"

The Financial Project ID should always have a 3X phase in it. 3X is for Preliminary Engineering (design). Example: 415211-1-32 01  
or 415211-1-31 01

***Preliminary Engineering Certification*** is required if Federal Funds are used for either Design or Construction phases.

**Agency Maintenance Agreement  
for Work Performed by the Department  
Sheet 1 of 3**

Financial Project ID: \_\_\_\_\_

Federal Aid No. \_\_\_\_\_

Local Agency: \_\_\_\_\_

Project Description: \_\_\_\_\_

\_\_\_\_\_

Bridge No.: \_\_\_\_\_

**MAINTENANCE AGREEMENT**

THIS AGREEMENT, made and entered into on this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between the STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION (hereinafter called "DEPARTMENT"), and \_\_\_\_\_, Florida (hereinafter called "LOCAL AGENCY");

WITNESSETH:

WHEREAS, the DEPARTMENT is preparing to undertake a project within the LOCAL AGENCY and LOCAL AGENCY identified and known to the parties by Financial Project I.D. \_\_\_\_\_ which will be of benefit to the LOCAL AGENCY; and

WHEREAS, approval of federal aid necessary to the project requires agreement by the LOCAL AGENCY to maintain the project;

NOW, THEREFORE, in consideration of the premises, the parties hereby agree as follows:

1. The DEPARTMENT will undertake the project and obtain approval of the Federal Highway Administration for federal participation.
2. Upon completion and acceptance, the LOCAL AGENCY will assume responsibility for maintenance of the project and will conduct such maintenance in accordance with approved state standards.
3. To the extent permitted by law, LOCAL AGENCY must indemnify, defend, and hold harmless the DEPARTMENT and all of its officers, agents, and employees from any claim, loss, damage, cost, charge, or expense arising out of any act, error, omission or negligent act by LOCAL AGENCY, its agents, or employees, during the performance of the Agreement, except that neither LOCAL AGENCY, its agents, or its employees will be liable under this paragraph for any claim, loss, damage, cost, charge, or expense arising out of any act, error, omission, or negligent act by the DEPARTMENT or any of its officers, agents, or employees during the performance of the Agreement. Nothing herein must waive the rights of sovereign immunity of either party.

**Sample Local Agency Maintenance Agreement  
For Work Performed by the Department  
Sheet 2 of 3**

4. In the event there are cost overruns, supplemental agreements (specifically incurred in the areas located off the State Highway System), and or liquidated damages not eligible to be paid for by federal funds due to the Federal Highway Administration determining that said costs are non-participating costs, the LOCAL AGENCY must be responsible for one-hundred percent (100%) of the funds required to make up the shortfall not paid by federal funds. The Project is off of the "State Highway System," therefore, in accordance with **Section 339.08(1), Florida Statutes**, State funding cannot be used for payments of non-participating costs on this Project. (Examples of non-participating items could be fishing piers; premium costs due to design or CEI errors or omissions; material or equipment called in for the plans but not used in the construction, as referenced in the Federal Aid Policy Guide 23, **CFR Section 635.120**).
  - a. Should such shortfalls occur, due to a determination that said costs are non-participating, the LOCAL AGENCY agrees to provide, without delay, a deposit within fourteen (14) calendar days of notification from the Department, to ensure that cash on deposit with the Department is sufficient to fully fund the shortfall. The Department must notify the LOCAL AGENCY as soon as it becomes apparent there is a shortfall; however, failure of the Department to so notify the LOCAL AGENCY must not relieve the LOCAL AGENCY its obligation to pay for its full participation of non-participating costs during the Project and on final accounting, as provided herein below. If the LOCAL AGENCY cannot provide the deposit within fourteen (14) days, a letter must be submitted to and approved by the Department's project manager indicating when the deposit will be made. The LOCAL AGENCY understands the request and approval of the additional time could delay the project, and additional non-participating costs may be incurred due to the delay of the project.
5. The DEPARTMENT intends to have its final and complete accounting of all costs incurred in connection with the work performed hereunder within three hundred sixty days (360) of final payment to the Contractor. The Department considers the Project complete when the final payment has been made to the Contractor, not when the construction work is complete. All non-participating Project cost records and accounts must be subject to audit by a representative of the LOCAL AGENCY for a period of three (3) years after final close out of the Project. The LOCAL AGENCY will be notified of the final non-participating cost of the project. Both parties agree that in the event the final accounting of total non-participating costs pursuant to the terms of this Agreement is less than the total deposits to

date, a refund of the excess will be made by the Department to the LOCAL AGENCY. If the final accounting is not performed within three hundred and sixty (360) days, the LOCAL AGENCY is not relieved from its obligation to pay.

- 6. In the event the final accounting of total non-participating costs are greater than the total deposits to date, the LOCAL AGENCY will pay the additional amount within forty (40) calendar days from the date of the invoice from the Department. The LOCAL AGENCY agrees to pay interest at a rate as established pursuant to Section 55.03, Florida Statutes, on any invoice not paid within forty (40) calendar days until the invoice is paid.
- 7. Any payment of funds under this Agreement provision will be made directly to the Department for deposit.

IN WITNESS WHEREOF, the parties hereto have set their hands and seals on the day and year first above written.

\_\_\_\_\_  
LOCAL AGENCY OFFICIAL

STATE OF FLORIDA  
DEPARTMENT OF TRANSPORTATION

By: \_\_\_\_\_  
Title: \_\_\_\_\_  
\_\_\_\_\_  
(Type Name)

By: \_\_\_\_\_  
District Secretary

ATTEST:  
\_\_\_\_\_  
Clerk (Seal)

ATTEST:  
\_\_\_\_\_  
Executive Secretary (Seal)

LEGAL APPROVAL:  
\_\_\_\_\_  
LOCAL AGENCY Attorney  
\_\_\_\_\_  
(Type Name)

LEGAL APPROVAL:  
\_\_\_\_\_  
Senior Attorney

### Items of Work Checklist

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

TO: \_\_\_\_\_, District Specifications

FROM: \_\_\_\_\_, Project Manager

COPIES TO:

**SUBJECT: ITEMS OF WORK**

Financial Project ID: \_\_\_\_\_ (GOES WITH \_\_\_\_\_)

County (Section): \_\_\_\_\_

\* Project Description: \_\_\_\_\_

The plans package for the above referenced project includes the following items of work to be performed:

- |                        |                             |
|------------------------|-----------------------------|
| Milling & Resurfacing  | Highway Signing             |
| Base Work              | Guardrail                   |
| Shoulder Treatment     | Landscaping                 |
| Drainage Improvements  | Box or Three-sided Culverts |
| Curb & Gutter          | Bridges                     |
| Traffic Signals        | MSE Walls                   |
| Lighting               | Sidewalks/Shared Use Path   |
| Other (Please Specify) |                             |

Please include the county, project description and all items of work that apply in the *Intent and Scope* so they may be added to the advertisement description.

\* The project description should only include the road number and the limits or location of the project.

## PORTABLE CHANGEABLE MESSAGE SIGNS WORKSHEET

Location of board: \_\_\_\_\_

Used: from \_\_\_\_\_ at \_\_\_\_\_

to \_\_\_\_\_ at \_\_\_\_\_

Message programmed by: \_\_\_\_\_

### MESSAGE 1

_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____

### MESSAGE 2

_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____

Timing:

Message 1 will run: \_\_\_\_\_ seconds.

Message 2 will run: \_\_\_\_\_ seconds.

## STANDARD ABBREVIATIONS FOR USE ON CHANGEABLE MESSAGE SIGNS

Standard abbreviations easily understood are:

<u>WORD</u>	<u>ABBREV.</u>	<u>WORD</u>	<u>ABBREV.</u>
Boulevard	BLVD	Normal	NORM
Center	CNTR	Parking	PKING
Emergency	EMER	Road	RD
Entrance, Enter	ENT	Service	SERV
Expressway	EXPWY	Shoulder	SHLDR
Freeway	FRWY, FWY	Slippery	SLIP
Highway	HWY	Speed	SPD
Information	INFO	Traffic	TRAF
Left	LFT	Travelers	TRVLRs
Maintenance	MAINT	Warning	WARN

Other abbreviations are easily understood whenever they appear in conjunction with a particular word commonly associated with it. These words and abbreviations are as follows:

<u>WORD</u>	<u>ABBREV.</u>	<u>PROMPT</u>
Access	ACCS	Road
Ahead	AHD	Fog*
Blocked	BLKD	Lane*
Bridge	BRDG	[Name]*
Chemical	CHEM	Spill
Construction	CONST	Ahead
Exit	EX, EXT	Next*
Express	EXP	Lane
Hazardous	HAZ	Driving
Interstate	I	[Number]
Major	MAJ	Accident
Mile	MI	[Number]*
Minor	MNR	Accident
Minute(s)	MIN	[Number]*
Oversized	OVRSZ	Load
Prepare	PREP	To Stop
Pavement	PVMT	Wet*
Quality	QLTY	Air*
Route	RT	Best*
Turnpike	TRNPK	[Name]*
Vehicle	VEH	Stalled*
Cardinal Directions	N, E, S, W	[Number]
Upper, Lower	UPR, LWR	Level

\* = Prompt word given first



The following abbreviations are understood with a **prompt** word by about 75% of the drivers. These abbreviations may require some public education prior to usage.

<u>WORD</u>	<u>ABBREV.</u>	<u>PROMPT</u>
Condition	COND	Traffic*
Congested	CONG	Traffic
Downtown	DWNTN	Traffic
Frontage	FRNTG	Road
Local	LOC	Traffic
Northbound	N-BND	Traffic
Roadwork	RDWK	Ahead [Distance]
Temporary	TEMP	Route
Township	TWNNSHP	Limits

\* = Prompt word given first

Certain abbreviations are prone to inviting confusion because another word is abbreviated or could be abbreviated in the same way. **DO NOT USE THESE ABBREVIATIONS:**

<u>ABBREV.</u>	<u>INTENDED WORD</u>	<u>WORD ERRONEOUSLY GIVEN</u>
WRNG	Warning	Wrong
ACC	Accident	Access (Road)
DLY	Delay	Daily
LT	Light (Traffic)	Left
STAD	Stadium	Standard
L	Left	Lane (Merge)
PARK	Parking	Park
RED	Reduce	Red
POLL	Pollution (Index)	Poll
FDR	Feeder	Federal
LOC	Local	Location
TEMP	Temporary	Temperature
CLRS	Clears	Color

## RECORD SHOP DRAWING TRANSMITTAL

Date \_\_\_\_\_

TO: \_\_\_\_\_

FROM: \_\_\_\_\_

(Final Review Office)

PROJECT NAME \_\_\_\_\_

FINANCIAL PROJECT ID \_\_\_\_\_

FEDERAL AID PROJECT NO. \_\_\_\_\_

CONTRACT ID NUMBER \_\_\_\_\_

COUNTY (SECTION) \_\_\_\_\_

STATE ROAD NUMBER \_\_\_\_\_

BRIDGE NUMBER \_\_\_\_\_

CONTRACTOR \_\_\_\_\_

ENGINEER OF RECORD \_\_\_\_\_

We are transmitting herewith the following Record Shop Drawings for archiving:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_

For the Final Review Office: \_\_\_\_\_

(Signature)

\_\_\_\_\_

(Date)

For the Receiving Office: \_\_\_\_\_

(Signature)

\_\_\_\_\_

(Date)

## 104 Public Involvement

### 104.1 General

FDOT's policy on [Public Involvement Opportunities](#), *Topic No. 000-525-050* states:

"The Department recognizes the importance of involving the public in information exchange when providing transportation facilities and services to best meet the State's transportation needs. Therefore, it is the policy of the Florida Department of Transportation to promote public involvement opportunities and information exchange activities in all functional areas using various techniques adapted to local area condition and project requirements."

Detailed information on Public Involvement activities and requirements can be found in the *Project Development and Environment Manual (PD&E Manual) Part 1, Chapter 11* and the [Public Involvement Handbook](#).

Typically, when a project reaches the design phase, many of the project commitments and community issues have already been identified. However, there are times when design alternatives need to be reevaluated to determine their community impacts. Any commitments made in previous phases are communicated to designers, who are responsible for carrying them out. If constraints arise that require design changes which affect FDOT's ability to meet commitments, then the process would require follow-up with the affected community. In such cases, additional public involvement and community impact assessment may be necessary to address public concerns.

Projects may have the following potential community impacts that are not identified until the design phase:

- (1) Impacts on public safety, including people with disabilities
- (2) School crossings or other areas of high pedestrian activity
- (3) Aesthetic features such as landscaping or tree replacement
- (4) Medians or access changes
- (5) Intersections and driveways, including audible signalized intersections
- (6) Accessibility of corridor businesses and neighborhoods
- (7) Significant improvements to bicycle, pedestrian and transit facilities
- (8) Lighting
- (9) Maintenance of Traffic

- (10) Railroad crossings
- (11) Location and extent of storm water management facilities

### **104.1.1 Noise and Perimeter Walls**

See **FDM 264.4** for Public Involvement requirements for noise and perimeter walls.

## **104.2 Community Awareness Plan (CAP)**

FDOT Community Awareness Plan Guidelines for all design and construction projects identify four levels of public involvement based on the type of project:

- Level 1:** Project is noncontroversial, causes negligible accessibility impacts, and causes minimal traffic disruption.
- Level 2:** Project has general public acceptance, little impact on accessibility or traffic, and a moderate degree of traffic disruption. Examples include urban resurfacing, bridge repair projects, and other construction activities that may require lane closures.
- Level 3:** Project may be controversial, will significantly impact traffic flow, or will significantly affect accessibility to properties (temporary or permanent). Examples are parking removal, median openings or closures, access management issues, traffic signal removal, roadway widening, major reconstruction, and projects including detours.
- Level 4:** Project involves road widening or major reconstruction, bridge widening or replacement, new interchange, or closures (temporary or permanent) of the roadway, ramps, bridges, or railroad crossings.

Modification for Non-Conventional Projects:
See RFP for commitments and special CAP requirements.

### 104.3 Public Information and Outreach

Start developing and implementing a public information and outreach campaign when the design phase begins. Ongoing monitoring throughout the life of the project will be necessary. The following steps should be used when planning and implementing a public information and outreach campaign.

- (1) **Determine appropriate size and nature.** The size and nature of a public information and outreach effort is determined by the characteristics of a project, its location, and the anticipated impacts. Address the size and duration of the project, the amount of delay anticipated, special traffic and safety conditions such as heavy truck traffic, changes to bicycle and pedestrian routes and facilities, and disruptions to other modes and key facilities such as airports, stadiums, and hospitals.
- (2) **Identify resources.** Typically, public information and outreach spending is included in the project budget. In addition, the Department may need to tap existing resources, such as an operating 511 system and the Lane Closure Information System (LCIS), and leverage external resources such as free media coverage.
- (3) **Identify partners.** Working with a range of partners to design and implement an information and outreach campaign will strengthen the strategies employed and may reduce the costs and resources. Partners may include state and local agencies, major employers, and business and neighborhood associations, local clubs and advocacy groups.
- (4) **Identify target audiences.** Identifying target audiences is a key in developing an effective communication strategy. This determine the types of messages that should be conveyed and the best method of communicating those messages.
- (5) **Develop the message(s).** The messages communicated should provide project information to maintain safety and minimize delay, and should indicate that the agency cares about the traveling public, including transit riders, pedestrians, cyclists, and motorists. More specific messages might include details of the work zone, travel times through the work zone, alerts regarding the need for cyclists to share or control a travel lane, and alternate routes and modes of transportation.
- (6) **Determine communication strategies.** How information is communicated will depend on the audiences, the messages to be conveyed, and the campaign budget. The [Public Involvement Handbook](#) discusses a wide range of strategies for communicating information about a project.
- (7) **Determine communication timing.** Begin public information and outreach before work commences to develop partnerships and inform the public about the project, its anticipated impacts, and additional sources of ongoing project information. Early

contact and coordination with bicycle groups (such as Metropolitan Planning Organization Bicycle/Pedestrian Advisory Committees or bike clubs) helps mitigate friction.

## **104.4 Recommended Activities**

A public information and outreach campaign involves communicating with road users, the general public, area residences and businesses, and appropriate public entities about a road project and its implications for safety and mobility.

### **104.4.1 Design Activities**

The District PIO should also have final approval of informational documents intended for public distribution.

Typical activities corresponding to the level type are provided as follows:

#### CAP Level 1

- (1) Provide Phase II plans to city, county officials, and staff to solicit comments and concurrence. Minimal activities involved in Plan.

#### CAP Level 2,3,4

- (1) When requested, provide presentation(s) to city, MPO, County Commission, legislators and community groups regarding design, impact and construction status.
- (2) Provide plans for all phase reviews to city, county officials, and staff to solicit comments and concurrence.
- (3) Provide plans for all phase reviews to maintenance, construction, and appropriate Operations Center.
- (4) Following Phase II review:
  - (a) Send Notice of Access Impact (driveway closures/modifications) to affected property owners. If done by mass mailing, all proposed access revisions must be clearly stated in the mailing.
  - (b) Project Information Workshop(s) with city and county staff, elected officials, property owners, and interested public to solicit comments. Mass mailing of invitation or project flyers are typically coordinated by the Department Project Manager and the District Public Information Officer (PIO).

## **104.4.2 Construction Activities**

Typical activities corresponding to the level type are provided as follows:

### CAP Level 1,2,3,4

- (1) 2-4 weeks prior to beginning construction activities, conduct a mass mailing of project information with construction dates and specific traffic impact information. Project flyers are typically coordinated by the Construction Project Manager and the District Public Information Officer (PIO).
- (2) 1 week prior to beginning construction activities, Include information regarding the project start date, pertinent project information and specific traffic impacts in the District PIO's Weekly Traffic Report (news release).
- (3) Throughout the construction phase, include specific traffic impacts in the District PIO's Weekly Traffic Report (news release). It is the Construction Project Manager's responsibility to provide the District PIO with this information in a timely manner to meet media deadlines.

### CAP Level 2,3,4

- (1) After Letting, conduct a 'Hand Off' meeting including representatives from Design, Construction, Utilities, Traffic Operations and Maintenance. This meeting is typically scheduled by the Design Project Manager.
- (2) When requested, provide presentations to city and county officials, legislators, community groups and property owners regarding project status, as needed or requested.

### CAP Level 3,4

- (1) During the development of Scope of Services for C.E.I., determine if a consultant Public Information Officer is required for the project. This decision will be made by the Design Project Manager, Construction Project Manager and the District Public Information Officer (PIO). The District PIO should be involved in writing Requests for Proposals and Scopes of Services language that pertain to contracting with community involvement and public information consultants.
- (2) For project websites, Construction staff typically maintains the website in accordance with the Project Website Guidelines.

## 105 Aesthetic Design

### 105.1 General

Merriam-Webster defines aesthetic as “*pleasing in appearance; beautiful.*” Aesthetics has to do with human perception of whether places or objects are beautiful or ugly; elegant or tasteless; elaborate or plain. It is difficult to define aesthetics because it is a subjective topic. However, humans can generally arrive at a consensus of what is “pleasing in appearance.”

Successful implementation of aesthetics can be summarized in a quote by Alvar Aalto: “Beauty is the harmony of function and form.” In the design of transportation facilities, the roadway should blend with its physical and social environment.

Aesthetic design should achieve a balance between form, function, color, texture, durability, and cost. It is important that designers be sensitive to the aesthetic implications of their work and also to their personal aesthetic capabilities and limitations.

Florida’s beauty is a combination of the natural and built environment; credited with attracting millions to visit, invest, live, and work here. Transportation facilities are the largest, most visited, and most visible land use in Florida; the largest public spaces in most communities. Quality transportation design should not diminish the visual quality of a place and the experience of being there.

### 105.2 Aesthetic Design

Aesthetics is an integral part of the transportation design process and should not require additional tasks. Aesthetic designs are not an afterthought to embellish or provide adornments, frills, decorations, or add-ons to cover ugly parts. Affordable, biddable, constructible, and maintainable designs can artfully respond to the Department’s and communities’ safety, mobility, and aesthetic ideals. Even when there are no known aesthetic issues or when a project is minor, transportation facilities must not be ugly and detract from Florida’s beauty.

It is important to achieve a balance between form, function, color, texture, durability, and cost in the design of transportation facilities. Implementation of aesthetic principals in transportation design involves the balanced combination and implementation of the following elements:



- Form
- Scale
- Proportion
- Location
- Materials
- Lightness, darkness, shade, shadow, and reflection
- Color
- Perspective
- Context
- Viewsheds
- Durability
- Orientation
- Aspect
- Exposure

The placement of transportation elements (e.g., signs, signal control boxes, handrails) should be carefully considered during design. It may be possible to strategically place these items to avoid disturbing a scenic view.

### 105.3 Policies

#### [Constitution of the State of Florida, Article II, Section 7\(A\)](#):

“It shall be the policy of the state to conserve and protect its natural resources and scenic beauty.”

#### [Section 334.044 \(26\) Florida Statutes](#):

"The department shall have the powers and duties to...conserve the natural roadside growth and scenery; and to provide for the implementation and maintenance of roadside conservation, enhancement, and stabilization programs."

Aesthetic effects and roadway design considerations are discussed in the [PD&E Manual \(Topic No. 650-000-001\), Part 2, Chapter 5 and the FDOT Drainage Manual section 5.4.4.2 Detention and Retention Ponds](#).

### 105.4 Guidelines

Integrating aesthetics into transportation projects accomplish the following:

- (1) Support safety, mobility and enjoyment of all users, and can be integrated with functional elements.
- (2) Provide facilities that are compatible with the surrounding natural and built environment, based on the context of the roadway; e.g., the urban scale, surrounding architecture, forests, farms, parks, neighborhoods, landscape, community features, water bodies, views, and vistas.

- (3) Avoid, minimize, and mitigate insensitive solutions that detract from Florida's beauty.
- (4) Coordinated to provide a clear sense of order, clarity, and continuity.
- (5) Use materials and design solutions sensitive to scale, form, materials, color, pattern, texture, and architectural style of existing and proposed elements.
- (6) Address maintenance needs and responsibilities.

Roadways should blend into the landscape, avoiding large cuts and fills into the existing terrain. Horizontal and vertical alignment should be coordinated so that a driver has an opportunity to gain a sense of the local environment. Combinations of horizontal and crest vertical curves, and broken-back curves should be avoided. Excessively long tangent sections become monotonous. Curvature or other features should be added to maintain drivers' interest and awareness.

Vistas of exceptional beauty should be accentuated by the roadway geometrics. Ideally, such vistas should be on the outside of horizontal curves, without excessive roadside appurtenances and signs to clutter the view. Consider the view from, and the view of the transportation facility.

Preferred design solutions may require additional right of way (R/W). Aesthetics is an acceptable design objective. The Department has a wide discretion to select the amount and location of the property to be acquired. Courts can inquire whether the Department has adequately considered alternatives, costs, environmental factors, long-range planning and safety. As long as these factors are adequately considered, courts generally are not authorized to substitute their design judgment for that of Department unless the Department acts illegally in bad faith or abuses its discretion.

Often, the most attractive and elegant design solution can be low cost or no cost, and add little or no time to the project schedule.

## **105.5 Process**

Although beauty is subjective, two or more people can usually find consensus on what is attractive or beautiful and what is not. Seek and use the opinions of others to inform the final design.

Consideration of aesthetics begins early, and is as integral to the design process as safety and mobility. Within the time and budget available, identify and build on opportunities to improve the project aesthetics.

Visualize and evaluate each design element as it will appear from the road, the sidewalk, the bike lane, and from adjacent properties; day and night. Visualize how the element will appear after ten or more years of weather, minimal care, and typical use.

## **105.6 Safety and Scenic Beauty**

General principles of aesthetic design include form, scale, order, and proportion. Due to the need for uniformity in roadway design, there is often a lack of contrast and variety. This can contribute to driver monotony, a real safety concern. By integrating aesthetic design principles throughout the design process, the need for uniformity can be balanced with the need for variety and interest.

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## 106 Exempt Public Documents

### 106.1 General

This chapter describes the Department's policy concerning the distribution of sensitive documents used in the design and construction of structures.

### 106.2 Exempt Documents

In an effort to protect Florida's transportation infrastructure, the 2002 Legislature enacted **Section 119.071(3)(b), Florida Statute (F.S.)**, which provides that building plans, blueprints, schematic drawings, and diagrams, including draft, preliminary, and final formats, which depict the internal layout and structural elements of a building, arena, stadium, water treatment facility, or other structure owned or operated by an agency are exempt from the requirements of Florida's Public Records Law.

Therefore, plans, blueprints, schematic drawings and diagrams of structures owned by the Department are exempt from the public records provisions of **Chapter 119, F.S.** This exemption includes draft, preliminary and final documents and includes paper, electronic, and other formats.

### 106.3 Distribution of Exempt Documents

**[Procedure 050-020-026](#)** (*Distribution of Exempt Documents Concerning Department Structures and Confidential and Exempt Security System Plans*) describes the process for the distribution of documents deemed as Exempt Documents.

For the purpose of **[Procedure 050-020-026](#)**, the term "structure" includes bridges and culverts with an opening of more than 20 feet between undercopings of abutments or spring lines of arches or extreme ends of openings for multiple boxes, and those other bridges subject to safety inspection under **Section 335.074, F.S.** A roadway is not otherwise a structure.

Entities or persons outside the Department requesting or receiving copies of any portion of plans or other documents considered Exempt Documents must complete a request form (**[Form No. 050-020-26](#)**). The entity or person receiving the Exempt Documents must maintain the exempt status of the Exempt Documents. This procedure applies to all Department internal or contracted staff who have access to such Exempt Documents in their Department work.

## 110 Initial Engineering Design Process

Modification for Non-Conventional Projects:

Delete **FDM 110**, and see RFP for air space requirements.

### 110.1 General

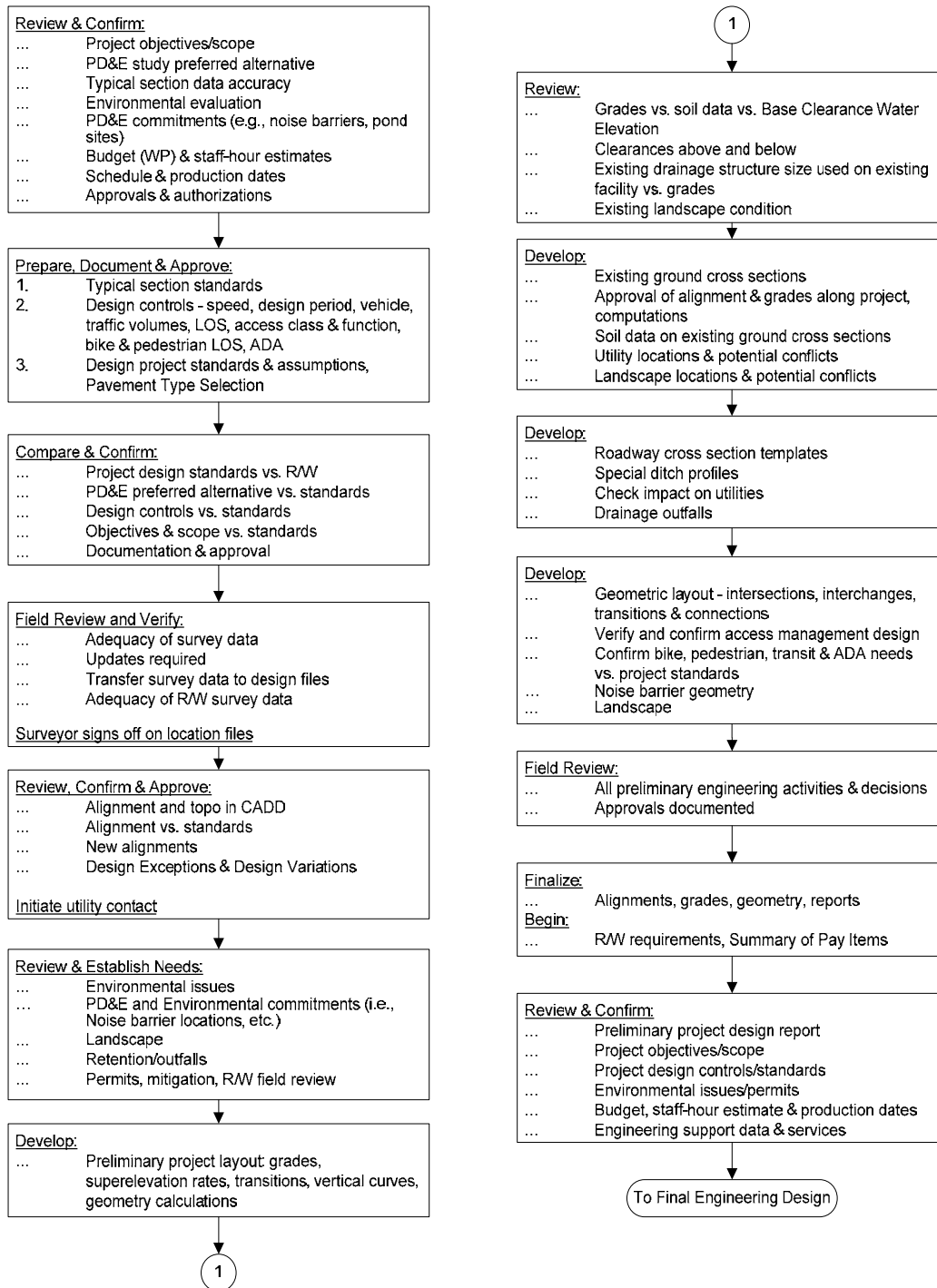
This chapter discusses the engineering design process which begins with the approval of the Project Location and Design Concept Acceptance and ends with the construction letting. It may include an update process when the construction plans and specifications are ready and on hold in the district and require revising to make them contract ready. Throughout this design process, quality control will be performed by those responsible for the engineering design and plans preparation activities.

The engineering and design activities and the schedules depend on the type of project and the required effort to accomplish the desired objectives. There are three basic types of projects:

- (1) **New Construction** - A highway or bridge project along a new corridor on new horizontal and vertical alignments.
- (2) **Add Lanes and Reconstruction** - A highway project along an existing facility to add lanes, widen or replace bridges, or improve intersections to improve capacity, safety, or operation.
- (3) **Other Projects** - May include Resurfacing, Restoration and Rehabilitation (RRR), operational improvements, safety enhancements, or improvements to extend the service life of an existing highway or bridge. These projects generally do not require a PD&E phase. The scopes are so varied that it is difficult to define them, except project by project. They can vary in magnitude from installing highway lighting for enhanced safety or resurfacing pavement to extend the service life, to minor lane and shoulder widening, bridge rail modification or intersection improvements. These projects may also include transit facilities, bike paths, sidewalks and landscaping.

**Figure 110.1.1** shows the major activities included in the initial engineering design process.

**Figure 110.1.1 Major Activities – Initial Engineering Process**



## 110.2 Initial Engineering Design

Generally, the initial engineering process should accomplish or complete the following activities:

- (1) Completely and fully define and document the objectives of the project and the scope of activities to accomplish them. This will almost always require an on-site review.
- (2) Document the surrounding context as it relates to aesthetics and accommodating trees (existing and proposed) and other long-lived plants.
- (3) Develop and document a realistic staff-hour estimate and production schedule to accomplish the scope of activities identified.
- (4) Establish and document the design controls, criteria, assumptions, project design standards, Design Exceptions, and Design Variations. Significant changes to previously approved PD&E concept may result in a re-evaluation of the Environmental Document. Discuss with the District Environmental Management Office.
- (5) Review Project Commitment Record (PCR) that was completed during PD&E and identify all prior PD&E commitments that will be addressed during design; e.g., the need to design and locate noise barriers (with insertion loss calculations), special pond site requirements, landscape or aesthetic considerations, pedestrian and bicycle commitments, access commitments, wildlife management commitments, wetland issues, transit issues.
- (6) Identify and document additional engineering, data gathering, and support services.
- (7) Determine and document the structural design requirements.
- (8) Determine and document if R/W is required.
- (9) Establish and document the review procedure and number of submittals, if different from guidelines provided in this manual.
- (10) Establish preliminary geometry, grades, and cross sections.
- (11) Identify and implement needed public involvement activities. See **FDM 104**.
- (12) Develop Pavement Type Selection Report based on FDOT [Pavement Type Selection Manual](#) (**Topic No. 625-010-005**).

If a PD&E phase has been completed, some of the activities listed above may have been performed to varying levels during that phase. The information contained in the preliminary engineering report should be considered as the starting point for the initial engineering phase. When there was no PD&E phase, the initial engineering design activities must establish the project scope, controls, criteria, and standards, data

gathering requirements, right of way (R/W) needs, and major design elements necessary to determine that the project is viable and R/W can be cleared.

### **110.3 Scope, Objectives, Schedule and Budget**

The Department's project manager is responsible for the development, review and approval of the project objectives, scope of work, and schedule in accordance with the [Project Management Handbook](#). They must also verify that required funds are in the work program.

The project objectives and scope are best confirmed and completed by:

- (1) Reviewing the PD&E study recommendations, conclusions and commitments.
- (2) Performing a field review of the project with the project manager and personnel from appropriate FDOT offices, such as Roadway Design, Traffic Operations, Safety, Right of Way, Utilities, Landscape, Survey, Maintenance and Construction.
- (3) Requesting a review of the draft scope of services activities by FDOT offices, such as Maintenance, Construction, Design, Traffic Operations, Access Management, Public Transportation, Pedestrian and Bicycle, and Environmental Management.
- (4) Developing the scope of services sufficient to advertise for professional services. After the scope of services is completed and approved, the schedule and budget may be confirmed and updated by the engineer/project manager and approved by the appropriate district manager. The scope of services should anticipate and include:
  - (a) The most cost effective methods that may be used in Subsurface Utility Engineering (SUE) for locating subsurface anomalies, structures, and utilities.
  - (b) Opportunities to accommodate existing trees, proposed trees, and other long-lived plants.

After consultant selection or in-house assignment, the designer or consultant should review and confirm the scope of services.

### **110.4 Project Design Controls and Standards**

The Engineer of Record (EOR) is responsible for establishing project design controls and standards to be used in the development of the construction plans. Document the selected project design controls and standards in the project file(s).



The design controls as addressed in this manual and AASHTO include right of way constraints, major utilities, design speed, design vehicle, design period, traffic volume and service level, functional classification of the corridor, access class, context classification, and other factors that control the selection of project standards that will ensure the facility will function safely at the level desired and expected by motorists, pedestrians and cyclists.

The Preliminary Engineering Report (PER) or project concept report may include some of the project design controls and standards to be used on the project. These design parameters should be reviewed, confirmed as valid and consistent with the overall corridor or system, and documented.

See **FDM 201.4** for information on selecting the appropriate design speed for the project.

Either a Design Exception or Design Variation, as described in **FDM 122**, must be obtained when selected project design controls and standards do not meet Department's criteria.

#### **110.4.1 Proprietary Products or Processes**

A proprietary product is defined as "a sole source or patented product or process. A product or process is also considered proprietary if it is identified by a plan note or specification so narrowly defined that only a sole source or patented product or process can meet the requirements."

It is important to identify these features as early in the design process as possible. If a project includes a proprietary product or process, the process outlined in the [Proprietary Products Review and Certification procedure \(Topic No.: 630-020-005\)](#) must be completed. This process includes approval by the District Design Engineer. Additional information on proprietary products is included at the following web site:

<http://www.fdot.gov/programmanagement/ProductEvaluation/ProprietaryProducts/ProprietaryList.shtm>

#### **110.5 Support Services**

Review information or support services that have been provided to determine the completeness and currency of data used in previous studies/reports.

Technical data required for the design of a roadway project can be available from various sources, such as:

- (1) Surveys - design, topographical, aerial, drainage, right of way location, soil, utilities
- (2) Traffic Data
- (3) Pavement Design
- (4) Environmental Documents (including Noise Study Report and wildlife connectivity recommendations)
- (5) Original Plans
- (6) Crash Data
- (7) Roadway Characteristics Inventory (RCI)

During the design process, the project will require coordination with different sections or offices. When engineering decisions, information, or other support services are required from FDOT functional areas, it is the project manager's responsibility to coordinate and facilitate the request and expedite a timely response. The functional areas include but are not limited to:

- |                                 |                              |
|---------------------------------|------------------------------|
| 1. Planning and Programs        | 11. FHWA                     |
| 2. Surveying and Mapping        | 12. Value Engineering        |
| 3. Traffic Plans                | 13. Traffic Operations       |
| 4. Geotechnical                 | 14. Environmental Management |
| 5. Drainage                     | 15. Access Management        |
| 6. Maintenance                  | 16. Structures               |
| 7. Construction                 | 17. Safety                   |
| 8. Utilities                    | 18. Plans Review             |
| 9. Estimates and Specifications | 19. Public Transportation    |
| 10. Right Of Way                | 20. Landscape Architecture   |
|                                 | 21. Central Office           |

## 110.5.1 Aviation and Spaceports

Coordinate with the District Aviation Coordinator when a project is within 10 nautical miles (11.5 statute miles) of an airport or spaceport.

Federal, state, and local regulations exist to protect the national airspace system and must be considered when planning and implementing construction that may adversely impact:

- (1) Military or public-use aviation facilities (airport, seaport, or heliport),
- (2) Navigational or communication facilities, or
- (3) Instrument approach flight procedures.

Federal law, [Title 14 Code of Federal Regulations \(CFR\), Federal Aviation Regulations \(FAR\), "Part 77, Subpart B – Notice Requirements" \(Part 77, Subpart B\)](#) requires that prior notification be given to the Federal Aviation Administration (FAA) regarding any proposed construction or alteration (permanent or temporary) of structures. Refer to **FDM 110.5.1.2** for FAA notification requirements.

Structures may include:

- Traverseways
  - Interstate Highways
  - Public Roadways
  - Private Roads
  - Railroads
  - Waterways
  - Other traverse ways
- Parking or rest areas
- Bridges and overpasses
- High-mast light poles
- Utility poles
- Antenna towers
- Buildings
- Signs or billboards
- Fences or gates
- Temporary-use construction materials or equipment, including dirt piles and cranes
- Natural growth, vegetation, and landscaping, depending on proximity to an aviation facility, navigational aid, or instrument procedure ground track

### 110.5.1.1 Required Coordination

For guidelines on airspace obstruction permitting, refer to **Chapter 333, Florida Statutes (F.S.)**, "Airport Zoning", and **Chapter 14-60, Florida Administrative Code**, "Airport Licensing and Airspace Protection".

While the responsibility for filing FAA notifications and local government permitting applications for Airspace Obstruction Permits, if applicable, rests with the Engineer of Record, the FDOT Aviation and Spaceports Office provides technical assistance on proposed projects to determine impact to the national airspace system in Florida. Please direct your inquiries to the following:

FDOT Aviation and Spaceports Office  
Airspace and Land Use Manager  
605 Suwannee St., M.S. 46  
Tallahassee, FL 32399-0450  
Tel: (850) 414-4500  
<http://www.fdot.gov/aviation/>

### 110.5.1.2 FAA Notification Guidelines

**Part 77 – Subpart B** requires that prior notification be given to the FAA regarding any proposed construction or alteration of structures that exceeds the criteria of **Part 77, Subpart B**. The FAA provides a [Notice Criteria Tool](#) via the Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) website (<https://oeaaa.faa.gov/>) that should also be used to determine if notice to the FAA is required due to possible obstruction of navigation or communication facilities.

If FAA notification is required, [FAA Form 7460-1, "Notice of Proposed Construction or Alteration"](#) can be submitted either electronically through the FAA's Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) website, or manually to the FAA Southern Regional Office in Atlanta. Submitting electronically is the preferred notification method. Submission of the Form 7460-1 will result in the FAA issuing a Determination whether the proposed structure constitutes a hazard to air navigation. If the structure is determined to be a hazard the construction may not proceed, according to Chapter 333, F.S.. The Form must be submitted at least 45 days before the earlier of the following dates:

- (1) Date proposed construction or alteration is to begin.
- (2) Date an application for a construction permit is to be filed.

Note that construction may not commence until the FAA issues a Determination that the structure is not a hazard.

### **FAA Emergency Notification:**

In the case of an emergency involving essential public services, public health, or public safety that requires immediate construction or alteration, the 45-day advance notice requirement does not apply. In such a case, the required notification may be sent by telephone or any expeditious means to the nearest FAA Flight Service Station, and within 5 days thereafter, a completed copy of the **FAA Form 7460-1**, must be submitted to the FAA Southern Regional Office in Atlanta.

## **110.5.2 Projects Involving Existing Bridges**

Special coordination efforts are required of the Design Project Manager on projects that involve demolition, renovation, repair, repainting or replacement of any bridge.

### **110.5.2.1 Projects Involving Steel Bridges**

For all projects that involve the repair, repainting or replacement of a steel bridge, the Design Project Manager must contact the State Corrosion Engineer in the State Materials Office and the District Contamination Impact Coordinator (DCIC) to determine if the bridge contains lead or other hazardous elements. The State Corrosion Engineer and DCIC will furnish a Modified Special Provision for disposition of the lead based paint waste for that particular project.

The Design Project Manager must provide the Modified Special Provision to the Engineer of Record who is preparing the contract plans and specifications. The Engineer of Record must ensure that the project specifications include Modified Special Provision and that they prohibit the use of lead based paint. A mandatory pre-bid conference is not required unless special conditions exist and the district determines one is needed.

### **110.5.2.2 Projects Involving Bridges with Asbestos-Containing Materials**

There may be asbestos-containing materials (ACM) used in bridges. Projects involving bridges that are to be either partially or fully demolished or renovated require an asbestos survey to be conducted by a licensed Asbestos Consultant. This should be completed as early in the project as possible to determine the nature and extent of ACM and if

abatement is required. Some bridge elements potentially containing asbestos include (but are not limited to) the following:

- (1) Tender House Roof Materials (e.g., felts, flashings, mastics)
- (2) Tender House Floor Materials (e.g., tiles, sheet flooring, mastics)
- (3) Tender House Wall Materials (e.g., drywall muds, joint compounds)
- (4) Tender House Window Materials (e.g., caulks, gaskets)
- (5) Bridge Equipment Materials (e.g., gaskets, packings, linings, insulation)
- (6) MSE Wall Gaskets
- (7) Beam/Deck Bearing Pads
- (8) Asbestos-cement pipes (e.g., scuppers)
- (9) Bascule Bridge Machinery Brake Pads
- (10) Trowelled-on or Sprayed-on Decorative Coatings

### **110.5.2.3 Projects Involving Bridge Demolition**

At or before the 30% plans phase, the Department will determine if it has a need for the debris resulting from the demolition of a bridge. If no such need exists, and in response to **Section 1805, SAFETEA-LU Legislation**, the Department is then required to notify local, State and Federal government agencies of the availability of the bridge debris for their beneficial use (use as shore erosion control or stabilization, ecosystem restoration, and marine habitat restoration). For any projects that involve the complete demolition of a bridge, the Design Project Manager is required to notify these agencies of the availability of the resulting debris. The Bridge Development Report (BDR)/30% Structure Plans (see **FDM 121**) will include the approximate volume of debris and the estimated timeframe in which the material will be available.

The Design Project Manager must coordinate with the receiving agency and the District Construction Engineer to develop a Joint Project Agreement. The receiving agency will be responsible for all additional costs associated with the processing, delivery, placement and use of the material. The following items must be determined in order for the Joint Project Agreement to be developed:

- (1) The volume of raw (unprocessed) debris (a more detailed quantity than original estimate).
- (2) The estimated timeframe for the debris availability.

- (3) The location of the receiving agency's staging/storage site to which the raw debris is to be delivered. Any further work involving processing and final placement of the material is expected to be the responsibility of the receiving agency and not part of the FDOT's contract for bridge demolition.
- (4) An estimated cost to transport the debris to that site. This estimate will be amount the receiving agency must pay the FDOT.

Once this information is determined, the contract plans will include the instructions for the delivery of the debris.

If no agency expresses interest in the debris material, then the material will be disposed of in accordance with FDOT Specifications.

Requirements for the original notification to agencies (including a sample Notification Letter) and the resulting Joint Project Agreement are found in the [Project Management Handbook, Part 2, Chapter 3](#).

The demolition of bridges with ACM requires that Asbestos Abatement Plans be developed by a licensed Asbestos Consultant. **FDM 110.5.2.2** and the [Construction Project Administration Manual \(CPAM\), Section 10.4](#) contain additional requirements for projects involving demolition of bridges with ACM.

### **110.5.3 Projects Involving Bridges Over Navigable Water**

For projects involving bridges over navigable water, the Design Project Manager must provide the District Structures Maintenance Engineer (DSME) sufficient notification prior to engaging in any action in, on, or around the bridge(s). This includes any field reviews involving persons conducting activities that may be perceived as suspicious (e.g., parking on the bridge, repeated viewing from a boat or other vehicle, carrying cameras and other electronic equipment like a GPS, etc.) This will allow the DSME to notify the U.S. Coast Guard prior to such activities taking place.

### **110.5.4 Wildlife Connectivity**

Wildlife connectivity features include new or modified structures; e.g. bridges, bridges with shelves, specially designed culverts, enlarged culverts, or drainage culverts. Exclusionary devices such as fencing, walls or other barriers may be included to funnel wildlife to a crossing. Disciplines that may be involved in this effort include Structures, Roadway, Drainage, Environmental Management, Permitting, Right of Way and Utilities.

Wildlife connectivity needs are usually identified during the PD&E study. However, coordinate with the District Environmental Management Office and District Permit Office early in the design phase for determination of the type, size and other parameters for the wildlife crossing feature. For further guidance on wildlife connectivity refer to the [FDOT Wildlife Crossing Guidelines](#), commitments section of the Environmental Document, and any other documentation regarding the wildlife connectivity related to the project.

In the event that wildlife connectivity needs are not identified until after the design process has begun, immediately start the coordination process with the District Environmental Management Office and District Permit Office.

### **110.5.5 Interstate Projects Affecting Logo Structures**

Determine if the construction activities on Interstate mainline or ramp projects may impact logo sign structures. Any affected logo structures must be identified so those logo structures can be properly addressed in the plans. Once the affected logo structures are identified, the designer must coordinate with the State Outdoor Advertising and Logo Manager and the District Traffic Operations Office to determine if the logo structures need to be relocated or redesigned during construction. Through this coordination, the following questions must be answered:

- (1) Will the construction activities require the relocation of any logo structures during construction?
- (2) Where will the logo structures be reinstalled?
- (3) Will an upgrade of the sign panel, support or foundation of the affected logo structure be required?

The disposition of any affected logo structures must be addressed in the plans. Logo structures requiring relocation will be paid for using pay item 700- 21- 40 (Multi-post Sign, Relocate). Logo structures requiring replacement will be paid for with the appropriate multi-post sign removal, and installation pay items.

Refer to the Logo Sign Program web page for additional information:

<http://www.fdot.gov/rightofway/LogoSignProgram.shtm>

### **110.5.6 Buy America Provisions**

All manufacturing processes for steel or iron materials, including application of a coating, utilized in all highway construction projects must occur in the United States, in accordance with the Buy America provisions, established in **23 CFR 635.410**. Buy America



requirements are covered in [FDOT Standard Specifications, Section 6](#). The allowable levels of foreign steel or iron and contractor certification requirements are identified in **Specification 6-5.2**.

While **Specification 6-5.2** applies to contractors, designers also have a responsibility to ensure Buy America provisions are met. When Buy America provisions are not met, the entire project is not eligible for Federal funds. The design engineer of record needs to do sufficient research to determine that any steel or iron called for in the plans is manufactured in the United States. This is necessary when the plans include the following:

- (1) Non-standard or special grade steel components and shapes.
- (2) New proprietary products containing steel or iron materials.
- (3) Sole source products containing steel or iron materials.
- (4) Special machinery with steel or iron components.
- (5) Heavy sections of steel sheet pile wall.

It is not necessary to conduct such research for the following:

- (1) Standard domestic steel beams and shapes of standard grades as shown on the National Steel Bridge Alliance (NSBA) website.
- (2) Standard concrete reinforcing steel sizes and grades.
- (3) Standard steel drainage pipe sizes and gages.
- (4) Items covered in the [Standard Plans](#) including:
  - (a) Standard mast arm assemblies.
  - (b) Standard steel guardrail, posts, and end treatments.
  - (c) Standard drainage grates.
  - (d) Standard steel fences.
  - (e) Standard steel sign supports and structures.

If it is determined that a steel or iron product being proposed is not manufactured in the United States, then the Designer must determine if the estimated costs of such foreign steel or iron is within the thresholds stated in the specification. If the costs exceed such threshold, the Designer must explore alternatives that utilize domestic steel or iron, or seek a waiver from FHWA. Generally it is preferred to select a different engineering solution utilizing domestic products.

Should a waiver become necessary, it must be obtained before the contract letting to ensure federal funding is not jeopardized. Submit Buy America waiver requests to the Central Office for concurrence by the Directors of Design and Construction and notify the Office of Work Program of the requests. Upon concurrence, requests will then be forwarded to the FHWA Florida Division Office for approval and coordinated with the FHWA headquarters in Washington, D.C. for further concurrence. Originals will be returned to the District by the Central Office. These issues must be identified early in the plans preparation process.

### **110.5.7 Traffic Monitoring Sites**

One or more traffic monitoring sites should be considered for addition to each construction project which has a type of work consistent with the construction of such sites. Examples of compatible work types include traffic signals, resurfacing, reconstruction, and other work that involves either pavement surfaces or electrical systems. Inquiries about monitoring sites should be addressed to the Traffic Data Section Manager of the Transportation Statistics Section, Office of Planning.

### **110.5.8 Fire Suppression Systems**

FDOT owned fire suppression systems are not allowed on bridges, retaining walls or limited access facilities unless they are approved by the Chief Engineer due to special circumstances. Commonly occurring traffic related incidents will not be considered as special circumstances or as justification for the installation of any fire suppression system. If an FDOT fire suppression system is approved, agreements must be executed with a local agency to bear all installation costs, repair costs and maintenance functions.

Any fire suppression system that is not owned by FDOT is defined by **Section 337.401, (F.S.)** as a utility and is not to be issued a utility permit unless approved by the Chief Engineer in accordance with **Rule 14-46.001, Florida Administrative Code** and the Utility Accommodation Manual.

### **110.5.9 Trees, Landscape, and Landscape Irrigation**

Consistent with Department policy, determine how the project can be designed to accommodate existing desirable trees and proposed trees. Determine if any commitments have been made to preserve or provide trees, landscape or landscape irrigation. Determine if a landscape project is programmed or proposed as a component or standalone by the Department or a local agency.

## **110.6 Preliminary Geometry**

To establish geometry, the following activities should be accomplished or near completion:

- (1) Supporting data such as surveys, traffic and pavement evaluation data.
- (2) Typical sections and pavement design.
- (3) Standards, Design Variations, and Design Exceptions.
- (4) PD&E commitments addressed.
- (5) Need for R/W phase addressed.
- (6) Utility initial contact and survey data.
- (7) Transit initial contact and facility location.

The initial engineering design activities to establish the preliminary project plans are:

- (1) Set and calculate the horizontal alignment.
- (2) Set the proposed profile grade lines.
- (3) Develop preliminary cross sections at selected intervals or control locations.
- (4) Develop preliminary layout of roadway, intersections, interchanges, transitions, and connections.
- (5) Field review all proposed preliminary engineering layout and decisions for conflicts, R/W needs, connections, updates and additional needs.

The initial engineering review is used to obtain confirmation and approval of the objectives, scope, standards, decisions, and assumptions to be used as the basis for the engineering and design.

The above activities should result in the following:

- (1) Structures can now be given the horizontal and vertical alignment and clearance requirements for bridges.
- (2) R/W Engineering can be furnished with mainline R/W requirements for the project.
- (3) Plan-profile sheets can be clipped.
- (4) Traffic plans development can be initiated.
- (5) Cross sections, grades and alignments, as required, can be provided to the drainage section.

- (6) Work sheets, as needed, can be provided to the permits section for initial evaluation.
- (7) Utility/Agency Owners (UAOs) can be provided plans, profiles and cross sections as required to identify/verify and designate their existing utilities as well as indicate proposed installations.
- (8) The list of pay items can be loaded into Designer Interface by identifying the items of work involved at this stage of design.
- (9) The need for noise barriers has been confirmed and locations established.

## 111 Final Engineering Design Process

### 111.1 General

The final engineering design process follows the initial engineering design process and review. The primary objective of the final engineering design phase is to prepare contract plans and specifications that can be used to bid and construct the project with a minimum number of field changes, delays, and cost overruns.

Modification for Non-Conventional Projects:

Delete the above paragraph and replace with the following:

The primary objective of the final engineering design phase is to prepare contract plans and specifications sufficient to construct the project.

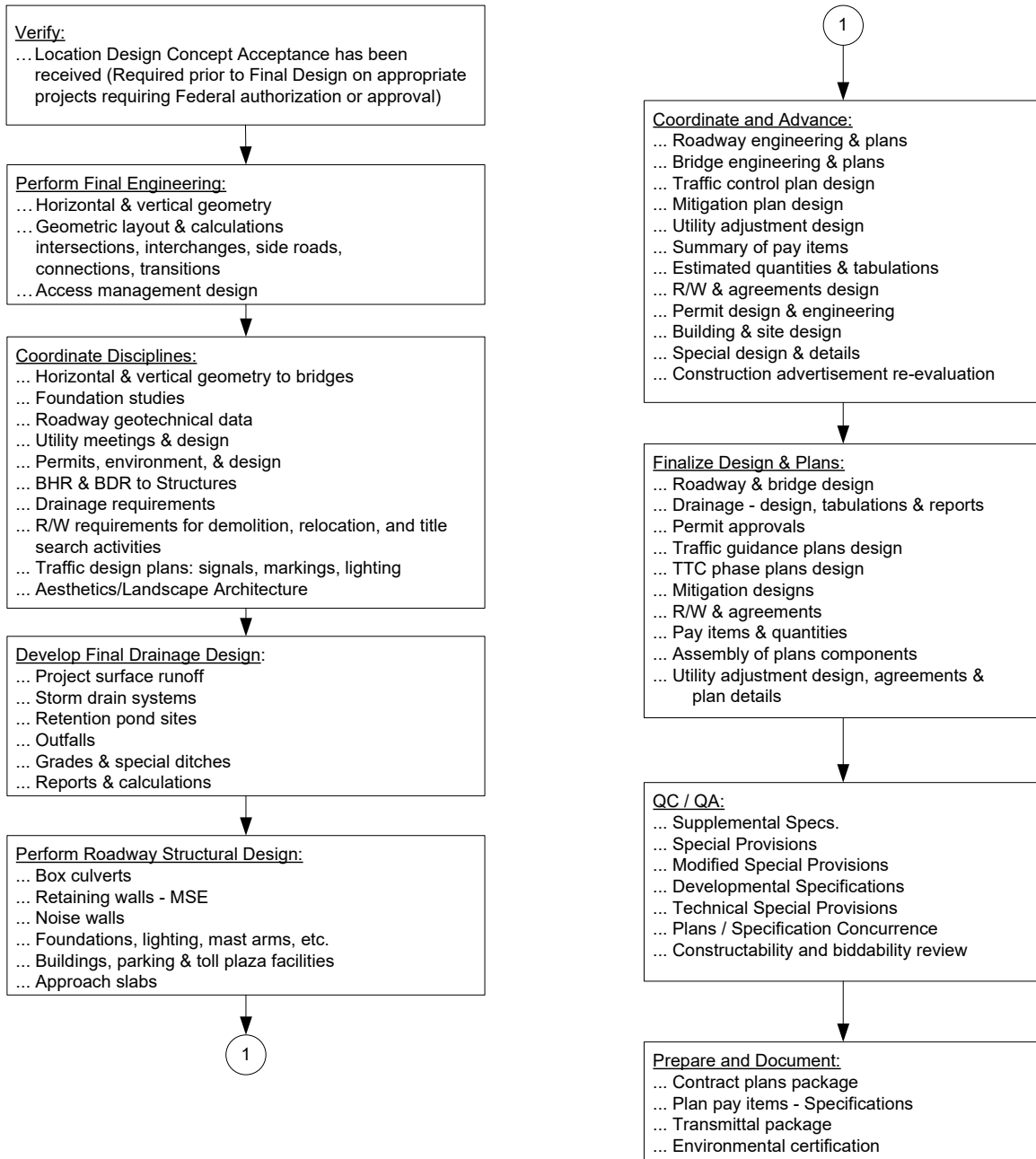
On projects requiring Federal authorization where the Design Phase and the PD&E Phase overlap, the Department must receive Location Design Concept Acceptance (LDCA), prior to acceptance of the Phase II submittal (prior to advancing into Final Design). To advance past Phase II coordinate with the Environmental Management Office who will work with FHWA (see **Part 1, Chapter 4** of the [PD&E Manual](#)). The Design Project Manager must coordinate with the PD&E Project Manager, and the District Environmental Management Office to ensure that that the Department has received LDCA for the project. The Design Project Manager will need to convey this information to the district federal aid staff in the District Work Program Office. (See the [Project Management Handbook, Part 2, Chapter 3](#)). **Figure 111.1.1** shows the major activities included in the final engineering design process.

Modification for Non-Conventional Projects:

Delete the first two sentences of the above paragraph and replace with the following:

On projects requiring Federal authorization where the Design Phase and the PD&E Phase overlap, the Department must receive Location Design Concept Acceptance (LDCA), prior to finalizing the RFP.

**Figure 111.1.1 Major Activities – Final Engineering Design Process**



## 111.2 Final Engineering Design

The Engineer of Record (EOR) and Design Project Manager must coordinate all activities to ensure that the quality, accuracy, and appropriate decisions go into the performance of each step. The project quality control should include a plan-do-check routine for each set of activities or operations.

The major design activities include, but are not limited to, the following:

- (1) Pavement design
- (2) Drainage design
- (3) Structural (bridge) design
- (4) Structural (roadway) design
- (5) Roadway design including access management, earthwork, selective clearing and grubbing, geometrics, ADA
- (6) Traffic plans design including signing, marking, signals, lighting
- (7) Utility adjustment design
- (8) Permit preparation design including ponds, mitigation
- (9) Traffic control plans (work zone) design
- (10) R/W requirements design
- (11) Building and site design including landscaping, ADA, transit
- (12) Estimates and Quantities preparation
- (13) Specifications and special provisions
- (14) Landscape design including accommodating existing and proposed vegetation.
- (15) Noise barrier design

Modification for Non-Conventional Projects:
Delete item 12 above.

### 111.2.1 Work Program Administration (WPA) System

Project stationing information is to be checked and entered into the Work Program Administration (WPA) system during final engineering design. This information is

important for tying construction records, such as material coring, sampling and testing to other databases. The information is entered by stations, which are related to roadway mile post for later information retrieval.

The EOR is responsible for finalizing the project stationing. The District Design Engineer should designate an individual to be responsible for coordinating the input of stationing information into the WPA system.

The begin and end stations, and station equations are entered into the WP50 computer screen under FM on the FDOT CL/SUPERSESSSION Main Menu for each WPA location. After logging onto SUPERSESS, the WP50 designees enter on FM (Financial Management System). On the FM Main Menu, press ENTER: 3 for WPA (Work Program Administration). On WPA Main Menu, press ENTER: 25 for WP50 (Station Definition).

Update access to WP50 screen is granted through the Work Program Development Office in Tallahassee. Listed below are the important edit and browse features:

- (1) Only enter FM Item Segment number on the top line.
- (2) The RDWYLOC sequence number displays on the top line of the screen and on the first line of the header information. It's entered on the top line to retrieve a particular location.
- (3) The transaction type "00" is entered on the top line to browse all station equation information for that RDWYLOC. The transaction type "02" is entered on the top line to update all station equation information for that RDWYLOC. The transaction type "99" is entered on the top line to erase all station equation information for that RDWYLOC.
- (4) Press the F8 key will forward from one RDWYLOC to the next RDWYLOC on the same Item Segment number. Press ENTER key to update or delete data on the screen depending on the transaction type but will not page forward.
- (5) Press F3 key will take the user to the FM main menu while press F15 key will take the user back to the SUPERSESS main menu.

After entering the station information, it is important to verify the milepost limits in WPA are still accurate. This can be accomplished by reviewing the WP50 computer screen.

If the project length has changed, the District Work Program Office should be advised to correct the mileposts.



## 111.3 Contract Plans Preparation

The products of the engineering design activities are component sets of contract plans. The major component sets may include:

- (1) Roadway
- (2) Signing and Pavement Marking
- (3) Signalization
- (4) Intelligent Transportation Systems (ITS)
- (5) Lighting
- (6) Landscape
- (7) Architectural Plans
- (8) Structures Plans

Each Utility Work by Highway Contractor Agreement may have a separate phase for each Financial Project Identification Number (FPID). The plan set for each agreement is placed in the back of the contract plans set under the associated FPID.

Modification for Non-Conventional Projects:

Delete the two sentences above and see the RFP.

These component sets, the specifications package, and the pay items list with calculated quantities are assembled and packaged as the construction contract letting documents.

Modification for Non-Conventional Projects:

Delete the sentence above and replace with the following:

These component sets, the specifications package, and the pay item list are assembled and packaged as the construction contract documents.

### 111.3.1 Three-Dimensional Models

If horizontally and vertically controlled cross sections are required for plans production to communicate design intent and construct the project, then that section of the project should be three-dimensionally (3D) modeled.

Modification for Non-Conventional Projects:

Delete **FDM 111.3.1** and see RFP for requirements.

## 111.4 Standard Specifications and Special Provisions

The EOR must develop engineering designs that can be constructed, controlled, measured and paid for under the current [Standard Specifications](#). In the event the work required is not covered by the Standard Specifications or the supplements and special provisions thereto, the EOR must develop Modified Special Provisions or Technical Special Provisions to be made part of the contract for the project. The EOR can obtain Department procedural guidance to assist with the preparation of the specifications package. Additional guidance on the preparation of Specification packages can be found in the [Specifications Handbook](#).

## 111.5 Pay Items and Summaries of Quantities

As the engineering plans are prepared, the quantities are calculated, tabulated, and summarized by Pay Item (of work) as stipulated by the Standard Specifications and the [Basis of Estimates Manual](#). The summary of pay items is updated as quantities are determined and summarized.

Modification for Non-Conventional Projects:

Delete **FDM 111.5**.

## 111.6 PS&E Package Submittal

A submittal consisting of the final Plans, Specifications, and Estimate (PS&E), along with any other contract and transmittal documents, is known as a PS&E package. PS&E submittals are numbered consecutively, and re-submittals are required until the project is accepted by the District Program Management Office. The PS&E package is transmitted to the Central Office for letting or is assembled and held in the district for district advertisement and letting. **FDM 131** provides further guidance on the contents of the transmittal.

Modification for Non-Conventional Projects:

Delete **FDM 111.6**.

## **111.7 Project Documentation Submittal**

This section is currently under development.

## 112 Update Engineering Design Process

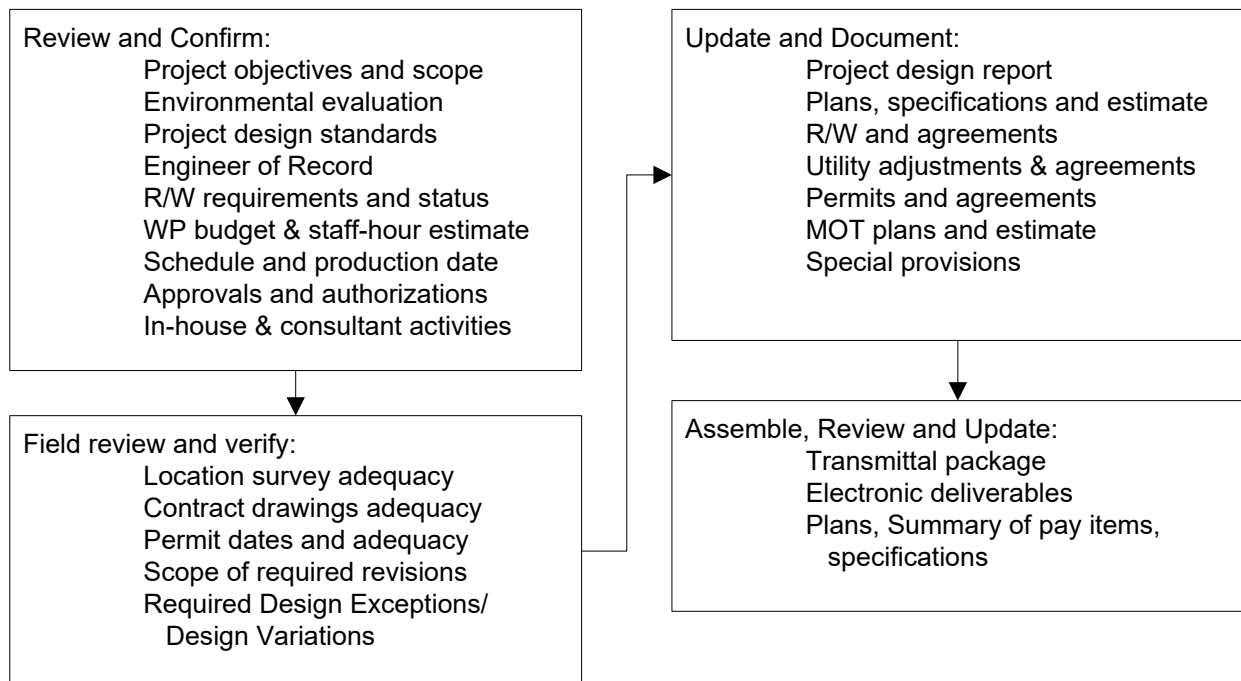
### 112.1 General

Conduct the update engineering design process when a period of time has elapsed (typically nine months minimum) since final contract plans, specification and estimates (PS&E) package was completed. The requirements of the update process depends on:

- (1) Type of project
- (2) Adequacy and appropriateness of the original design controls and standards
- (3) Original scope and objectives.

Determining the extent of the update process, as shown in **Figure 112.1.1**, requires input from both engineering and management.

**Figure 112.1.1 Major Activities - Update Engineering Design Process**



## 112.2 Design Update Review and Decision Process

Conduct an engineering review of the PS&E package and supporting documents to determine the activities required to update the package and get it ready for letting.

- (1) Review and compare the original project objectives, scope and standards with current corridor conditions, as well as growth rate and patterns, to determine if the project design is still valid.
- (2) Review and compare the original environmental evaluations and commitments against current requirements.
- (3) Review and compare the permit date and terms against current requirements.
- (4) Review R/W certifications and agreements and confirm the status of documents.
- (5) Compare contract plans against current requirements, including [Standard Plans](#), [Standard Specifications](#), pay items, and design criteria.
- (6) Review agreements with outside entities such as Utility Agency/Owners (UAOs), maintaining agencies and local agencies to determine if the agreements are still valid.
- (7) Resubmit Design Exceptions and Design Variations with updated documentation based on current data and conditions.

If it is determined that engineering updates are required, the scope, staff-hour estimate, schedule, cost estimate, and other activities described in **FDM 110** should be followed to the extent necessary to define the scope and schedule for the update process.

## 112.3 Updating Engineering Design and Documents

The actual engineering design activities necessary to update the PS&E package will vary from project to project. Develop a fully defined scope of work to determine resources and schedule needed for the update. Fully describe the required activities in the professional services contract, if one is to be used.

All reports, calculations, assumptions, and engineering decisions that support the changes to plans, specifications, or other documents must be sealed by the Engineer of Record (EOR) updating the PS&E package. Changes to the plans are approved by the EOR and require concurrence by the District Design Engineer, District Structures Design Engineer, or District Consultant Project Management Engineer, as appropriate for the type of change. Updated documentation of approvals and concurrences must be in the project file.

## **112.4 Revised PS&E Package**

In addition to the required engineering changes, the contract transmittal package must be reviewed and updated to current status.

- (1) All component plans sets are made current and sealed.
- (2) Specifications and special provisions are made current.
- (3) The CADD files are revised.
- (4) The pay item summaries (estimates) are made current.
- (5) The contract file is made current.

## 113 Right of Way Requirements

### Modification for Non-Conventional Projects:

For Design Build projects, the Department will endeavor to purchase all required right of way prior to release of the RFP. If additional right of way is proposed through the ATC process, based on the Department's concurrence, the Design-Build firm must provide the funding for purchase of the additional right of way. In either case, the Department must conduct the right of way acquisition process, and the Design-Build firm must not commence construction on any parcel until the Department certifies that right of way has been purchased.

### 113.1 General

To assist the roadway designer's understanding of right of way (R/W) requirements, which must be addressed during the project development and design phases of projects, the following terms are briefly defined as an introduction.

Right of Way is real property or an interest therein, donated or acquired by purchase or condemnation, to accommodate transportation improvements. Fee simple is the strongest interest available to the Department and is sought for most permanent highway facilities. When improvements are designed which will fall outside of the existing R/W boundaries, additional lands must be identified and acquired. All necessary right of way and easements must be in Department ownership prior to advertisement of the project for letting.

Limited Access R/W is purchased for facilities such as Interstate and Expressways. This limits public access to interchange connection-points designed with entrance and exit ramps and limits access to motorized vehicular traffic. Pedestrians and bicycles are restricted in the interest of traffic capacity and safety.

Controlled Access R/W is acquired for the remaining State Highway System. This allows the general public and landowners along the corridors reasonable access, but in a controlled pattern that will facilitate the movement of through traffic.

Perpetual Easements grant a right of use over, under or through the property of another. They are used when permanent structures or improvements are to be constructed and maintained on parcels where acquisition of fee title would be impractical; e.g., sight triangles or drainage facilities. Condemnation powers may be utilized to acquire Perpetual Easements.

Temporary Easements grant a temporary right of use over, under or through the property of another. They are used when it is necessary to temporarily occupy a parcel for a specific purpose such as construction of improvements requisite of the project, construction of temporary detours, stock piling materials or parking equipment. A Temporary Easement may also be necessary when it is determined that reestablishing access causes a compensable impact to the use of the abutting land or causes a safety issue due to a change in grade. No improvement which requires maintenance by the Department beyond the term of the easement can be constructed on a temporary easement.

License Agreements are used to gain access to adjoining properties for sloping, grading, tying in, harmonizing and reconnecting existing features of the licensor's property with the highway improvements to be constructed. This work is for the benefit of the property owner. The Department does not compensate for License Agreements. If the owner refuses to execute the agreement, the Department will not perform the work outside of Department right of way.

Licenses are included here as real property interests for convenience, but they are not real property interests. A license, with respect to real property, is a privilege to go on the premises for a certain purpose but does not vest any title in the licensee.

The most economical means of constructing the project should always be the objective. The designer must design the highway facility within the existing R/W, obtain a License Agreement, or request acquisition of R/W to accommodate project elements.

## **113.2 Procedures for Establishing Right of Way Requirements**

The procedures for addressing R/W requirements require engineering analyses, economic comparisons and professional judgments. Consultation with the District R/W Surveyor and District R/W Manager is required. One excellent method of providing the consultation is the "R/W Partnering" concept with all parties that have a vested interest participating in the decision making process.

Alternate design studies will be required in many locations to determine if additional R/W should be purchased, a retaining wall constructed or modified slopes and barrier system should be considered. A reasonable estimate of R/W costs or damages expected must be obtained from the R/W Office in order to make such a design study. Alternate construction methods may be shown on the plans as preferred and alternate methods.



## 113.2.1 Open Cut and Fill Roadway Sections

R/W requirements along the project boundaries are dictated by the actual construction limits plus a reasonable maintenance buffer. The roadway cut and fill slopes, drainage ditch slopes and other construction elements are used to define the construction limits, which are generally shown on the roadway cross sections. R/W requirements are determined by reviewing the plotted cross sections after the roadway and drainage design elements have been established and major revisions are highly unlikely.

A joint field review of the proposed R/W is strongly encouraged and should be conducted at this point. The design details and the property information must be reviewed by the designer, personnel from the R/W Office, and personnel from the R/W Mapping Office. This review should be scheduled during the Phase II design process as defined in this manual and should address such issues as:

- (1) Will additional R/W be required for project access, maintenance of the facility, or transit facility needs? Check pond sites, high embankment slopes, bridges, outfalls, canals, and similar sites.
- (2) Can acquisitions be avoided or design modified to avoid substantial damages to remainder property or businesses? Examples include designing retaining walls or adjusting slopes or grades to reduce the difference in elevation between the remainder and the project grade at the R/W line.
- (3) Can the roadway grades be revised or connections relocated so access to the remainders can be constructed without damaging the use of the remainder, thereby minimizing or avoiding severance and business damages caused by altering the access?
- (4) Can drainage facilities (e.g., outfalls, ponds, ditches) be maintained without additional R/W space? Can uneconomic remainders be used for stormwater treatment?
- (5) Has consideration been given to joint use ponds (including golf course ponds) and/or regional treatment facilities?
- (6) Check the suitability and cost effectiveness of storm water treatment facilities and the status of permit approval.
- (7) What types of legal instruments are likely to be required to secure the appropriate property rights for the project?
- (8) Review the status of R/W activities by others in the project area. Avoid multiple acquisitions from the same owner at ramp terminals, intersections and by future FDOT projects.
- (9) Check for potentials of hazardous materials, "4F" parcels, utility easements, landlocked remainders and parcels, which could be eliminated.

- (10) Check for acquisitions involving existing treatment systems which could be mitigated within the FDOT system.
- (11) Discuss the possibility of advance acquisition of any parcel where development is imminent.
- (12) Check for incidental work which will fall outside of R/W such as trenching, wall forms, or equipment maneuvering space.
- (13) Check for availability of offsite property owned by FDOT which could be used for mitigation sites.
- (14) Discuss status of any R/W being claimed by maintenance pursuant to **Section 95.361, F.S.** (Maintenance Statute).

### 113.2.2 Curbed Roadway Sections

Establishing R/W requirements for curbed roadway sections will generally follow very similar procedures as the open roadway section projects. The analysis and decision making is complicated by more property owners, generally higher property values, businesses, and more complex access management problems.

The roadway and drainage design must be developed to a point where all major elements of the project (including transit facilities, signalization poles, lighting poles and overhead sign foundations) are firmly fixed. On projects with sidewalks and driveway connections, the design elements can be accurately established only if proper survey data has been obtained for the designer's use. Profile elevations along the proposed R/W line and back of sidewalk and half-sections or profiles at each driveway location should be obtained as a minimum standard practice.

The design engineer must perform the design work required to establish the project profile grades and the back of sidewalk grades to minimize the grade differences at the R/W line. Areas of superelevation must be analyzed very carefully. Split profile grades or other design strategies may be required to accommodate the proposed construction of the facility within minimum R/W limits.

The developed drainage and roadway design elements should be plotted on the plan sheets and the cross sections, which will establish the preliminary R/W requirements along the project boundaries as indicated by the construction limits. A good quality control review and a joint review with R/W appraisers and R/W Mapping personnel at this time will assist in determining the final R/W requirements. The same issues listed earlier in these procedures should be addressed.

### 113.2.3 Access Management

Access to the Department's facilities is an important element of the design and R/W determination procedures. Follow the Access Management Rules (14-96 and 14-97) and the procedures and directives adopted (**Topic Numbers 625-010-020** and **625-010-021**) to implement the objectives of those rules. Identification of access and median opening locations in relation to individual parcels should be completed before appraisal.

The following activities should be accomplished by the Designer:

- (1) The access classification of the roadway segment and the connection category of the driveways must be determined. The designer must be aware of the nature, type, frequency of trips and number of vehicles utilizing the driveway.
- (2) The designer must make a determination as to which driveways are in conformance, which are to be maintained, which are to be closed and which are to be modified to bring them into compliance.
- (3) The designer must obtain sufficient field survey data to establish the highway grades, horizontal alignment and the existing ground elevations in the vicinity of the driveway location. The data necessary to accurately design the driveway connection and determine an acceptable tie-in with the existing surface should be obtained as a minimum.
- (4) The designer should develop the most economical driveway design which will conform to the standards and the requirements of the access management objectives. Alternate designs and locations may be required to meet the property needs. Generally, the best option can be reached by negotiating with the property owner or tenant in a give-and-take atmosphere; however, the Right of Way Office must take the lead in such negotiations.

Driveway connections must be addressed in consultation with R/W personnel. This fact should not be overlooked on projects, such as resurfacing, on which there may not be any other R/W requirements. R/W related decisions to be made about driveway connections, probably on a case-by-case basis, include:

- (1) License Agreements are used where restoration of the driveway connection is not necessary to project construction or maintenance of the finished facility. The License Agreement allows the Department entry to the property at no cost in order to harmonize and reestablish the driveway connection. Refusal of the property owner to execute the License Agreement does not unduly affect construction of the project. If refusal would adversely affect the construction of the project, then a Temporary Construction Easement should be used and the engineer should be prepared to testify in court as to necessity.

- (2) In the situation where a team consisting of the engineer, the R/W Mapper, the District Right of Way Manager (DRWM), and Legal (or their designees) decides that (1) harmonization and restoration of the driveway connection is likely to cause a diminution in the use of the property, and (2) no taking for the benefit of the project is necessary, then the DRWM must decide on the appropriate method of compensating the property owner, whether by a TCE or some other means.
- (3) The Office of R/W will see that the proper instruments are executed to enter onto the property for purposes of construction and to compensate the owner for damages, if any are due. If other acquisition of that property is proposed, these instruments should include the entry and compensation, if any, for the driveway.
- (4) If there is no acquisition from a property, yet the property owner feels their property has been negatively affected by a project, the property owner can negotiate or claim damages through the inverse condemnation process.
- (5) Design personnel should, in their consultation with R/W personnel, make a determination if a fee taking or permanent easement is in the public interest to protect the facility. If a permanent easement will protect the facility and still give the owner some utility in the easement area, this may reduce the severance and business damages incurred.

#### **113.2.4 Procedures for Decision Making**

To assist in the decision process related to R/W requirements and instruments to be used, the following guidelines from the Office of Right of Way may be used during the joint review process. Close coordination with the District Right of Way Office and the Office of General Counsel is required during this decision-making process.

A License Agreement is the default method for driveway harmonization; use of a Temporary Construction Easement must be justified in terms of project integrity, cost or potential impact of the project on the property.

- (1) License Agreements should be used only if the following conditions can be met:
  - (a) The improvements or changes contemplated have no compensable impact to the use of the property, and are for the sole benefit of the property owner; and
  - (b) None of the improvements are required for the construction, operation and maintenance of the transportation facility and removal of, or change to the improvements will not be detrimental to the facility.
- (2) Temporary Easements should be used under the following conditions:

- (a) When it is necessary to temporarily occupy a parcel for a specific purpose such as construction of improvements requisite of the project, construction of temporary detours, stockpiling materials or parking equipment;
  - (b) When it is determined that reestablishing access creates a compensable impact to the use of the abutting land;
  - (c) Where grading, tying-in, harmonizing, and/or connecting an access point is required to maintain the safety and design of the facility;
  - (d) The contemplated improvements or uses of the property owner's land are required only during the period of construction of the transportation facility;
  - (e) Removal or alteration of the improvements to the property owner's land subsequent to construction would not be detrimental to the facility; and,
  - (f) After construction is complete, there will be no need for periodic re-entry onto the property by the Department for maintenance or other purposes.
- (3) Fee Simple R/W purchase should be used when the following conditions exist:
- (a) The planned improvements to the property owner's land are required as a part of construction of the transportation facility;
  - (b) The improvement on that land must remain in place as a part of the facility; and,
  - (c) Periodic re-entry to the property is required for maintenance or repair.

Perpetual Easements may be considered as an alternative to fee simple purchase in the R/W process if the owner may continue to enjoy some benefits of the property without impairing the Department's use and the total acquisition costs to the Department are less than the cost of acquiring fee.

### **113.2.5 Transmittal of Right of Way Requirements**

R/W requirements should be finalized before transmitting them to the R/W Mapping Office for preparation of R/W maps. All R/W requirement transmittals should be in writing and clearly indicate in the memo and on the plans which parcels have been finalized and which parcels are still pending. An effort should be made to transmit final R/W requirements in usable segments. Priority should be given to the major, expensive or complex acquisitions that are going to require more time to acquire and complete the relocation of the occupants. Advanced design effort and final R/W requirement determination may expedite meeting production ready dates. It is desirable to transmit requirements as early as possible in the plans development.

All R/W requirements that are firm (primarily mainline construction limits) should be transmitted by Phase II. All other requirements that generally involve more detailed design completion (e.g., outfalls, pond locations, corner clips, access needs) must be submitted by the Phase III stage completion of the roadway design plans.

All R/W requirements must be transmitted by the completion of the Phase III roadway design plans.

### **113.3 Process for Establishing Right of Way Requirements**

Establishing right of way requirements is a design process, but requires close coordination with other functions that have input to the project development and design of the project.

The Engineer of Record is responsible and must ensure that representatives from the appropriate functional areas are involved in the determination process. They must also ensure that a review of the final R/W requirements is performed. The "R/W Partnering" concept is an excellent method of ensuring that the proper consultation and input is received.

Generally, the R/W needs-determination will involve Roadway, Bridge and Drainage Design, Permits, Utilities, R/W appraisers, R/W Mapping and Legal functions. On consultant designed projects, the Department project manager's role as lead coordinator is especially critical.

#### **113.3.1 New or Major Reconstruction Projects**

These projects generally have Project Development and Environmental (PD& E) activities and Right of Way activities identified in the Work Program.

The project development process must address R/W requirements and perform sufficient preliminary engineering design to obtain preliminary cost estimates from the R/W Office. This may require that the PD&E consultant or in-house scope of services include work such as:

- (1) Preliminary roadway grades & geometric design.
- (2) Conceptual Drainage design and layout.
- (3) Analysis of major access management issues.
- (4) R/W Survey, property lines and limited topography.
- (5) R/W Mapping and property research activities.
- (6) Preliminary R/W cost estimates work.

- (7) Analysis of the transit, pedestrian/bicycle R/W needs.
- (8) Preliminary utility coordination.

This early identification of potential R/W requirements, approximate costs and work effort to complete R/W activities will greatly improve both cost estimates and schedules of projects. Also, involving R/W mapping and appraisers will assist in developing better project alternatives.

R/W requirements identified during the project development phase should not be considered firmly set. The R/W Office cannot be requested to begin R/W mapping or appraisal activities based on these requirements without extraordinary efforts by the designer to support the acquisition process as an advance acquisition.

### **113.3.2 Reconstruction Projects with Anticipated Right of Way Requirements**

These projects may not have a formal PD& E study, but they were determined during Work Program development to require some R/W acquisition. Most projects will require some environmental re-evaluation effort and all projects should have some preliminary engineering to better define objectives, scope and R/W requirements. The following general process, as it relates to R/W requirements should be established by design:

#### **PHASE I**

- (1) R/W Mapping will provide preliminary maps showing properties and all existing R/W lines for the project. These should be requested by the designer or by the Department project manager, on consultant projects.
- (2) The roadway designer will define project horizontal and vertical alignment and relate the existing R/W lines to the project as necessary to set R/W limits.

#### **PHASE II**

- (1) The roadway designer will identify proposed R/W requirements as indicated by the completed design details such as the following:
  - (a) Limits of construction slopes for roadway and bridges
  - (b) Cross section elements, transit facilities, ditches, curb returns and sidewalks
  - (c) Driveway and street connections
- (2) The drainage designer will identify proposed R/W requirements as indicated by the completed drainage features, which may include:

- (a) Retention or Detention Ponds
- (b) Mitigation of environmental issues
- (c) Drainage outfalls, sediment basins

The designer will review all proposed R/W requirements with the R/W Mapping Office. This should be performed during the Phase II design activities in order to make decisions on how each parcel of proposed R/W will be acquired. These decisions will impact which design approach is taken. The issues to be discussed and decisions to be considered are detailed in **FDM 113.2**.

- (3) As R/W requirements are determined, the information is furnished to the R/W Mapping Office by memo documenting clearly which R/W is final and which is pending. The R/W Mapping Office will use only the final requirements transmitted to prepare R/W maps. See **FDM 113.2.5**.

### PHASE III

- (1) By the completion of Phase III design, all R/W requirements will be identified and transmitted to the R/W Mapping Office.
- (2) After transmittal of final R/W requirements to the R/W Mapping Office, design changes that affect R/W must be coordinated with the R/W Mapping Office, in a timely manner.

The R/W shown on the roadway plans must be in exact agreement with the R/W Maps.

It is essential that close coordination be maintained with R/W personnel in order to ensure that design changes affecting R/W are transmitted promptly.

### **113.3.3 Projects without an Identified Right of Way Phase**

Many improvements to highway projects are intended to be accomplished within the existing R/W. Widening or resurfacing projects are examples. Such projects must be evaluated very carefully and very early in the roadway design process.

The addition of R/W requirements can have a tremendous impact on the schedule and on the anticipated costs of a highway improvement project. R/W Mapping should be consulted on all projects to ensure that the proposed construction lies completely within the existing R/W and no Trustees of the Internal Improvement Trust Fund parcels or maintenance surveys are required.

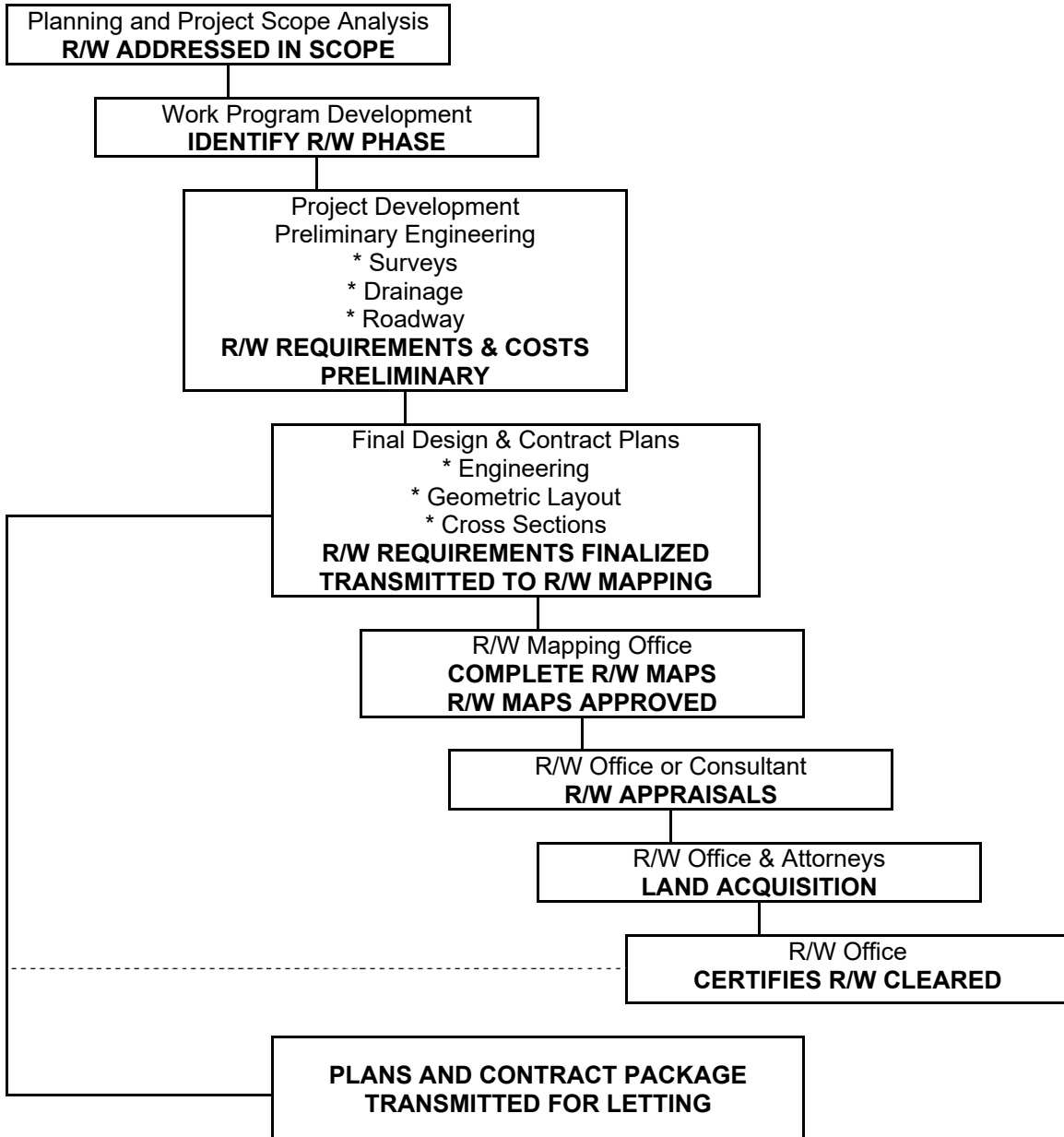


For all projects determined to be completely within existing R/W the Department project manager or District R/W Surveyor as appropriate, must notify the District R/W Manager, in writing, that no R/W is required. This notification will serve as the basis for the District R/W Manager's certification that all necessary R/W is available for construction.

If unanticipated R/W requirements are identified during design, the Production Management Office and the R/W Mapping Office should be notified as soon as the requirements are determined. The Production Management Office will then give direction as to continuing with the design and acquisition. If acquisition continues, it will follow the previously discussed procedures.

### Figure 113.3.1 Right of Way Requirements Generalized Process Flow Diagram

(Each function must have well defined written procedures for the development, quality control, coordination and regular exchange of product evaluation.)



## 114 Resurfacing, Restoration and Rehabilitation (RRR)

Modification for Non-Conventional Projects:

Delete **FDM 114** and see the RFP for requirements.

### 114.1 General

Resurfacing, restoration and rehabilitation (RRR) work is defined as work undertaken to extend the service life of an existing highway and enhance highway safety. This includes the placement of additional surface materials and other work necessary to return an existing roadway to a condition of structural and functional adequacy. This chapter contains processes and requirements necessary to evaluate existing roadways for safety and performance. For specific design criteria, see **FDM 210** and **211**.

RRR projects must be designed and constructed in compliance with the Americans with Disabilities Act accessibility standards and requirements.

This chapter does not apply to projects programmed as Maintenance Resurfacing projects or Ride Rehabilitation projects.

#### 114.1.1 Proposed Improvements (Type of Work)

The following items must be included in each RRR project unless written authorization to deviate from this policy is obtained at a Director level position in the District:

- (1) Safety improvements needed to address crash problems.
- (2) Pavement Resurfacing/Rehabilitation.
- (3) Modifications necessary to Comply with the American's with Disability Act (ADA).
- (4) Paved Shoulders.
- (5) Improvements to roadside barriers and guardrail necessary to meet minimum standards.
- (6) Improvements to bridge rails necessary to meet minimum standards.
- (7) Traffic Signal Mast Arms within the mast arm policy area (see **FDM 232.8.1**) where existing strain poles require replacement/relocation.

Other improvements may be included with the RRR projects; e.g., lighting, safety and operational improvements, signalization, minor roadway widening.

### **114.1.2 SIS Facilities**

Projects on controlled access SIS Corridor and Connector facilities should be designed using new construction criteria. RRR criteria may be applied on a project to the extent permitted by the Action Plan for that corridor, consistent with the schedule for phased improvements to bring the facility up to new construction criteria. For controlled SIS Corridors and Connectors with no Action Plan, RRR criteria may be applied if minimum design speed criteria shown in **FDM 201** are met, or a Design Variation or Design Exception for design speed is approved.

### **114.1.3 Interstate and Freeway Resurfacing**

The processes and requirements contained in this chapter are applicable for Interstate and Freeway resurfacing projects.

## **114.2 Planning and Programming RRR Projects**

The principal objectives of a RRR project are:

- (1) To preserve or extend the life of the existing pavement.
- (2) Improve capacity (without adding continuous through lanes).
- (3) Improve operating characteristics.
- (4) Provide safety modifications.

RRR projects are typically identified and programmed based on projections of deficient pavement condition and are funded under the Department's Pavement Resurfacing program. Districts are tasked with meeting assigned lane mile resurfacing targets. Resurfacing funds are allocated annually to each District based on an estimated cost per lane mile. The amount allocated includes funds necessary for pavement resurfacing, rehabilitation, minor reconstruction, and pavement milling and recycling. Refer to **Part III, Chapter 28, Resurfacing**, of the [Work Program Instructions](#) for funding resurfacing projects.

Due to limitations on resurfacing funds, improvements other than those necessary to address a safety need or to meet minimum design criteria must be carefully considered before inclusion in the project.

## 114.2.1 Right of Way (R/W) Acquisition

RRR projects do not typically involve R/W acquisition; however, review RRR projects to determine if additional R/W is required to meet project needs. Conditions that may warrant R/W acquisition include:

- (1) Correcting substandard roadway elements,
- (2) Need for transit stops,
- (3) Access management requirements,
- (4) New or improved drainage conveyance or treatment facilities, and
- (5) Intersection improvements (see **FDM 212** for conventional intersection criteria and guidance, and **FDM 213** for roundabout criteria and guidance).

When R/W acquisition is warranted, the design should be expedited to determine actual R/W requirements. Coordinate the requirements with the District Right of Way Office.

## 114.2.2 Survey Guidelines

Types of survey work typically included in RRR Projects are as follows:

- (1) Mill and resurface only, EOP to EOP, no other improvements [Level 1].
- (2) Resurface with trench widening (Roadway only) [Level 1 if lump sum excavation].
- (3) Resurface adding turn lanes (spot improvements) [Level 2].
- (4) Resurface adding shoulder pavement [Level 2].
- (5) Combination of numbers 2-4 [Level 2].
- (6) Resurface with access management improvements [Level 2].
- (7) Resurface with cross slope or superelevation correction [Level 2].
- (8) Add shoulder pavement only [Level 2 or 3].
- (9) (E) Extend drainage structures [Level 3].
- (10) (E) Guardrail, end treatments, (safety) [Level 2].
- (11) (E) Side drain closure; mitered ends [Level 3].
- (12) Intersection improvements [Minor = Level 2; Major = Level 3].
- (13) (E) Correct horizontal or vertical alignment [Level 3].
- (14) (E) ADA compliance [Level 2].

- (15) Approaches to structures [Level 4].
- (16) RRR with R/W acquisition [Level 3].

(E) = Element of an item

### **114.2.2.1 Minimum Levels of Survey Effort**

#### **(1) LEVEL 1**

Review by District Surveyor to check for Public Land Corners. Check sections for cross slope at 1000 feet in tangents. For curves, check 50 feet before PC, at PC, 50 and 100 feet after PC and at middle of curve or 300 foot intervals. (Reverse at PT). May use assumed datum if approved by the District Location Surveyor and the Project Manager/Designer. The cross sections will have a common bench mark elevation throughout the curve. In other words, do not assume an elevation at the centerline of the highway for each cross section. A minimum of two (2) bench marks should be set off of the highway near the R/W Line and may be on assumed elevations or NAVD 88 datum. If the surveyor elects to use temporary assumed bench marks, they must last throughout the life of construction and cannot be set in trees, power poles or concrete monuments. Establish begin and end points of project and reference.

#### **(2) LEVEL 2**

Minor spot improvements such as turn lane at existing crossover or turn lane on 2-lane. No additional R/W required. Where R/W is adequate, establish horizontal and vertical control in the improvement area. May use assumed vertical datum if approved by the District Location Surveyor and the Project Manager/Designer. The cross sections will have a common bench mark elevation throughout the curve. In other words, do not assume an elevation at the centerline of the highway for each cross section. A minimum of two (2) bench marks should be set off of the highway near the R/W Line and may be based on assumed elevations or NAVD 88 datum. If the surveyor elects to use temporary assumed bench marks, they must last throughout the life of construction and cannot be set in trees, power poles or concrete monuments. If R/W is constrained, re-establish existing R/W line. Level 1 required throughout other portions of project. Cross section level to be determined by Project Manager/Designer with input from the District Location Surveyor and Resident Engineer. TOPO with supplemental cross sections or elevations in area(s) of deficient criteria or proposed improvement(s). Reference control points outside R/W. Subsurface utility locates if required.

(3) **LEVEL 3**

Continuous improvements through length of project such as widening or paved shoulder; or major spot improvements (structure replacement; major intersection improvement). May require R/W purchase. Horizontal Control baseline, centerline or network. Vertical Control on NAVD 88. TOPO with supplemental elevations (limits to be determined). Digital Terrain Model (DTM) at specified locations. R/W Control Survey and Maps (if R/W purchased). Subsurface utility locates.

(4) **LEVEL 4**

Full Digital Terrain Model (DTM) and TOPO for entire project.

### **114.3 RRR Design Process**

The RRR design process is a team effort that requires familiarity with criteria for design, safety, maintenance, and traffic operations. To assure that these issues are addressed, the following assessments should be performed:

- (1) Current safety conditions and ADA deficiencies.
- (2) Need for operational improvements.
- (3) Drainage issues.
- (4) Public involvement activities.
- (5) Design Speed compliance with **Table 201.4.1**.
- (6) Compliance with Access Management requirements.

#### **114.3.1 Assessment of Existing Conditions**

Before beginning design of the project, perform office and field reviews to assess current conditions. The assessment includes both physical conditions and operating conditions.

##### **114.3.1.1 Office Reviews**

Review old plan sets, as-built drawings, Straight Line Diagrams, and other historical records to assess many of the existing conditions. This assessment should include:

- (1) Geometrics.
- (2) Radius, length, and superelevation of curves.

- (3) Typical shoulder treatments.
- (4) Cross drain and structure locations.
- (5) Location and design of intersections.
- (6) Existing cross slope and superelevation data.
- (7) Operating Conditions, including:
  - (a) A summary of legal posted speeds on the project.
  - (b) District Drainage and Maintenance concerns of past, present or anticipated problems.
  - (c) Conditions attributable to current control of access.
  - (d) A summary of known operational issues on the corridor (e.g., signal timing, detection failure).

A review of historical crash and travel statistics should be performed by a qualified safety specialist. This safety assessment, with written recommendations, should include:

- (1) Identification of significant crash locations, with:
  - (a) Determination of possible causes, and
  - (b) Suggested cost effective modifications or mitigation measures
- (2) Review of correspondence files for letters of public concern.

### **114.3.1.2 Field Reviews**

Perform a field review to observe physical, operational and safety conditions, and to verify office review findings.

- (1) Verify geometric and physical conditions by observing the following:
  - (a) Pavement condition
  - (b) Alignment
  - (c) Cross slope and superelevation
  - (d) Lane width
  - (e) Traffic control markings and signs
  - (f) Side slopes and clear zones
  - (g) Shoulder type and width



- (h) Intersection and bridge elements
  - (i) Sight distances
  - (j) Drainage (including erosion or siltation problems)
  - (k) Highway appurtenances
  - (l) ADA features
  - (m) Transit stops
  - (n) Pedestrian and bicycle features
- (2) Verify the following operating conditions:
- (a) Verify posted regulatory speeds and posted advisory speeds.
  - (b) Observe reported and suspected problem areas; e.g., signal timing, pedestrian detection, signal head placement.
  - (c) Evaluate access features.
- (3) Verify safety conditions by observing the following:
- (a) Known crash locations.
  - (b) Indicators of road departure or other unsafe operations; e.g., tire marks on walls or curb, tire tracks on front slope, guardrail repairs.

### **114.3.1.3 Identified Improvements**

Coordinate with the District Project Manager identified improvements necessary to correct deficiencies. Possible improvements that may be included in the project include:

- (1) Remove, relocate or make crashworthy roadside obstacles.
- (2) Remove unwarranted guardrail.
- (3) Upgrade or replace nonstandard guardrail, end treatments and crash cushions.
- (4) Replace or retrofit obsolete bridge rails.
- (5) Improve side slopes; slope flattening/stabilizing.
- (6) Correct shoulder drop-off.
- (7) Provide or widen paved shoulders.
- (8) Correct pavement cross slope and superelevation.
- (9) Provide side drain safety modifications.

- (10) Increase sight distance at intersections.
- (11) Improve pavement markings.
- (12) Improve pavement drainage.
- (13) Provide or upgrade sidewalks, transit stops and bikeways.
- (14) Replace or upgrade railroad crossing.
- (15) Provide or upgrade signalization.
- (16) Provide or upgrade lighting.
- (17) Upgrade signing and other traffic control devices.
- (18) Provide or upgrade curb cuts, ramps and other disability access features.
- (19) Reconstruct or close driveways to comply with Access Management standards.

#### **114.3.1.4 Design Exceptions and Design Variations**

RRR projects with existing features not meeting minimum criteria values require processing a Design Exception or Design Variation for the feature to remain. Refer to **FDM 122** for the Design Exception and Design Variation procedures.

#### **114.3.1.5 Design Documentation**

Include in the design file all documentation that substantiates the design process and decisions made. Documentation may include the following information:

- (1) A short paragraph which states the overall project purpose. Factors such as principal reason for the project, anticipated project cost, principal work type, general R/W needs or provisions, and any special project priorities are appropriately addressed here.
- (2) Documents that detail the existing conditions on the project. Findings of office reviews, field reviews and surveys are assembled here, to document existing geometric and roadside features, operating conditions, traffic volumes, posted speeds, existing pavement markings, signing, and safety. A brief overall summary of findings is recommended.
- (3) Document the selected standards based on project intent and conditions. When RRR criteria cannot be met, a Design Exception/Design Variation is required.
- (4) A summary of safety issues that have been identified for the project and the recommended solution of those issues.

- (5) Reviews of the project design for safety improvements, documenting what was finally accomplished or ruled out of the project subsequent to the scope of work having been completed.
- (6) Those items in the original scope of work for the project which cannot be reasonably accomplished and must be deleted or delayed.

### **114.3.2 Intersections**

Evaluate intersections to determine if a traffic engineering study is needed. The following items should be considered:

- (1) Traffic Signal Mast Arms or single point attachment span wires within the mast arm policy area where existing strain poles require replacement/relocation. See **FDM 232.8.1** for information on mast arm policy.
- (2) Addition of right and left turning lanes.
- (3) Realignment of intersection.
- (4) Adequate turning radii for left and right turning lanes.
- (5) Use of channelization to reduce excessive areas of conflict at large intersections.
- (6) Placement of crosswalks as related to sidewalks and stop bars.
- (7) Locations of pedestrian, bicycle, and transit facilities.
- (8) Locations of utilities, signal poles, controller cabinets, lighting poles and drainage structures as related to sidewalks and curb ramps.
- (9) Warrants for traffic control systems.
- (10) Addition of signal backplates where it would not require structural modifications to mast arms or span wire systems.
- (11) Addition of auxiliary heads where it would not require structural modifications to mast arms or span wire systems.
- (12) Installation of buried conduit for future traffic control systems.
- (13) Lighting for intersection illumination.
- (14) Adequate sight distance.
- (15) ADA needs.

Include corrective measures in projects having T-intersections with significant crash histories (three or more crashes of a specific type within the most recent five years) or other evidence of safety or operational problems.

When there are proposed changes in intersection control, a roundabout alternative must be considered. See **FDM 213** for additional information.

The additional cost associated with improvements requested by local governments that exceed the Department's criteria should be paid for by the local government making the request; e.g., installation of mast arm signal supports in areas beyond the mast arm policy area.

### **114.3.3 Drainage**

Evaluate the hydraulic, safety, and physical adequacies of the existing drainage system to determine if improvements are needed. Examine the existing drainage in the field and coordinate with district maintenance personnel. If there are apparent problems with the existing drainage system, determine the most cost effective improvements necessary to repair the system. The [Drainage Manual \(Topic No. 625-040-002\)](#) contains design criteria and methods which provide guidance in formulating suitable drainage features, either through modification or replacement.

See **FDM 215** for roadside safety requirements of drainage features.

Consult with drainage and environmental permitting specialists when the roadway modifications may reduce storage and infiltration or increase discharge rates and volumes. Stormwater retention or detention for quality, rate, and volume may be required. Theoretical evaluation of proposed changes to existing and new drainage features necessary to correct operational deficiencies should be referred to a drainage specialist. The drainage specialist will provide the necessary drainage design, flood data information, drainage related information for the Stormwater Pollution Prevention Plan (SWPPP) and any stormwater permit computations.

When siltation is noted during field review, coordinate with District Maintenance Office to determine if desiltation of existing pipes should be included in the project.

### **114.3.4 Pedestrian, Bicyclist, and Transit**

Pedestrian and bicycle features must meet the requirements contained in **FDM 222, 223, and 224**.

Transit features must meet the requirements contained in **FDM 225**.

Coordinate with the District Pedestrian/Bicycle Coordinator and the District Modal Development Office when deficiencies in these features are identified during the field review.

### **114.3.5 At-grade Railroad Crossing**

Federal-aid projects must be reviewed to determine if a railroad-highway grade crossing is in or near the limits of the project. If such railroad-highway grade crossing exists, see **FDM 220** for requirements.

Review physical and operational characteristics of at-grade railroad crossings for compliance with minimum standards. Discuss identified deficiencies with the District Railroad Coordinator. Resurfacing funds must not be used where the primary purpose is to improve an at-grade railroad crossing.

### **114.3.6 Lighting**

Lighting features must meet the requirements contained in **FDM 231**.

Lighting may be installed at specific locations to reduce the effects of ambient light conditions or to improve safety at the following locations:

- (1) Busy or high crash intersections
- (2) Transit stops.
- (3) Channelized intersections.
- (4) Car pool parking lots.
- (5) Pedestrian and bicycle crossings.
- (6) Ramp terminals.

Coordinate project needs with the District Lighting Engineer.

### **114.3.7 Signals, Signing, and Pavement Markings**

Signal features must meet the requirements contained in **FDM 212** and **FDM 232**.

Signing and Pavement Marking features must meet the requirements contained in **FDM 230**.

Coordinate project needs with the District Traffic Operations Engineer.

### **114.3.8 Bridge Structures**

See **FDM 260.9** for information on evaluating existing bridge structures.

Review bridges in sufficient detail to clearly establish cost effective and appropriate improvements to be included in the project. RRR program funds can be used only for minor bridge improvements; e.g., rail retrofits, ADA improvements.

Bridges that require substantial improvements, or replacement, should be programmed with the appropriate bridge program funds.

#### **114.3.8.1 Pier Protection**

The requirements for Pier Protection are outlined in **FDM 215**.

### **114.3.9 Roadside Safety Hardware**

See **FDM 215** for RRR requirements of Roadside Safety Hardware.

### **114.3.10 Sign, Signal, Lighting, and ITS Support Structures**

See **FDM 261.7** for information on evaluating ancillary structures.

## 115 Standard Plans and Standard Specifications

### 115.1 General

This chapter describes the relationship between the plans development process, the *Standard Plans for Road and Bridge Construction* ([Standard Plans](#)), and the *Standard Specifications for Road and Bridge Construction* ([Standard Specifications](#)). Additionally, the role Instructions for [Standards Plans](#) have in the process is outlined to ensure the proper application of [Standard Plans](#).

#### 115.1.1 Effective Dates

The [Standard Plans](#) are published on a yearly basis and are effective based on construction letting dates. The effective dates for each version are provided on the [Standards Plans](#) website. The governing version for every project must be identified in the plans in accordance with *FDM 302*. See the *Structures Detailing Manual* for additional requirements for bridges.

The [Standard Specifications](#) are published biannually and are effective based on construction letting dates.

Modification for Non-Conventional Projects:

Delete *Section 115.1.1* and see the RFP for the governing *Standard Plans* and *Standard Specifications*.

### 115.2 Standard Plans

The [Standard Plans](#) (formerly referred to as the [Design Standards](#)) are standard construction details, published as sets of Indexes in a web-based PDF format. The [Standard Plans](#) provide a consistent application of the Departments standard designs and details in the preparation of construction contract documents.

[Standard Plans](#) are developed with consideration for durability, maintainability, and broad applicability. As such, [Standard Plans](#) may not be universally suitable for all projects or site conditions. The Engineer of Record (**EOR**) is responsible for the appropriate application of Standard Plans within a project.

The [Standard Plans](#) comprise the latest and best practices of the Department as follows:

- (1) Designs comply with various specifications and guidelines as modified or adopted by FDOT including, but not limited to, **AASHTO** publications.
- (2) Compliance with various Federal laws and regulations.
- (3) Application of FDOT design criteria, policies and preferences
- (4) Pay Item, Approved Products List and Construction Specification consistency and coordination
- (5) Detail clarity
- (6) Proven designs with considerations for constructability and long term maintenance
- (7) Reserve structural capacity and/or redundancy of design
- (8) Material usage
- (9) Contractor familiarity
- (10) Formwork availability for concrete components

In this regard, incorporate the [Standard Plans](#) as appropriate on all projects unless a need to develop project specific designs can be documented.

The [Standard Plans](#) may be supplemented or amended by one or more of the following:

- **Standard Plans Errata**
- **Standard Plans Revisions**
- **Standard Plans Interim Revisions**
- **Developmental Standard Plans**
- **Modifications to Standard Plans**
- **Standard Plans Instructions**
- **Data Tables**

### 115.2.1 Standard Plans Errata

The Errata process is used to make minor changes to the [Standard Plans](#) before the next regularly scheduled annual version is published (i.e. out-of-cycle). These changes are limited to correcting editorial or typographical errors that would not affect the cost or implementation of the Index. When an Errata is published it will be shown on the [Standard Plans](#) website next to the Index along with a description of the change.



## 115.2.2 Standard Plans Revisions

**Standard Plans** revisions are the additions, updates, corrections, clarifications or deletions that are made to the document and implemented with the regularly scheduled annual version (i.e. in-cycle). The revisions, with the exception of minor editorial changes, are documented in the Revision History sheets which are posted on the **Standard Plans** website with each version.

## 115.2.3 Standard Plans Interim Revisions

**Standard Plans Interim Revisions (SPIR)** are changes which require implementation before the next regularly scheduled yearly version of the **Standard Plans** is published (i.e. out-of-cycle). The **SPIR** will also be posted on the website with the specifically affected yearly version of the **Standard Plans**. Interim revisions will typically be incorporated into the proceeding yearly publication.

Interim revisions will be made effective through the release of a **Design Bulletin** which will include the revised Index and the implementation requirements. At times the application of the **SPIR** may be at the discretion of the District; therefore, when the EOR has determined that a specific interim revision is applicable, it must be referenced in accordance with **FDM 302**.

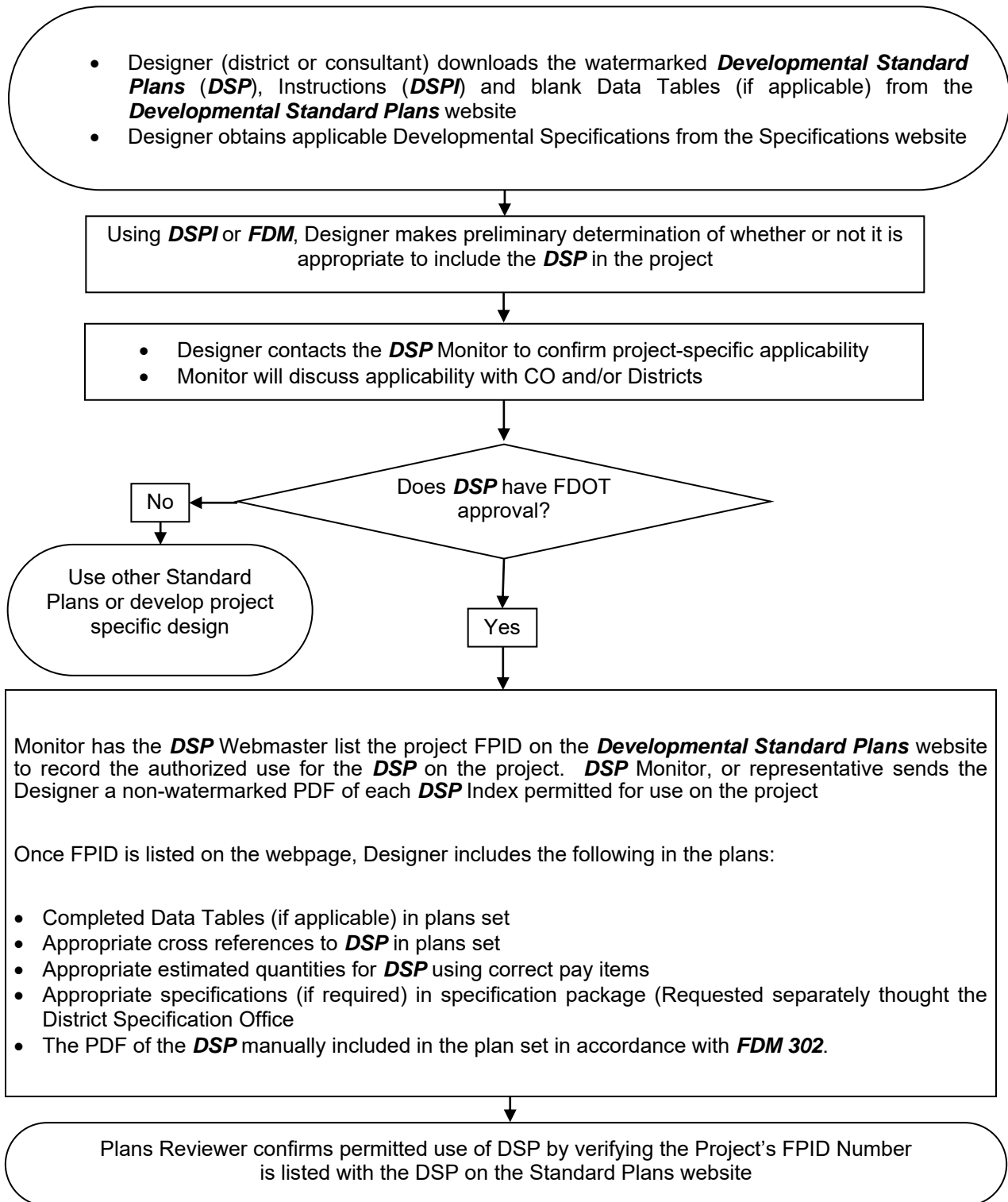
## 115.2.4 Developmental Standard Plans

**Developmental Standard Plans** is a process for integrating new or innovative concepts into the **Standard Plans**. A Central Office Monitor is assigned to each **Developmental Standard Plan**. The Central Office Monitor oversees the development of the Index, monitors the usage process, and makes changes as needed. Generally, the use of a **Developmental Standard Plan** requires the approval of the Central Office Monitor on an as-needed or as-available basis.

**Developmental Standard Plans** are typically released with a **Deign Bulletin** or as part of criteria included within the **FDM**.

Follow the process illustrated in **Figure 115.2.1** when seeking approval to use a Developmental Index. When a project specific use has been approved by the Central Office Monitor, the project's FPID number is listed on the **Developmental Standard Plans** website with the appropriate Developmental Index. Include the Developmental Index in the project plans in accordance with **FDM 302**.

**Figure 115.2.1 Developmental Standard Plans Usage Process**



## 115.2.5 Modifications to Standard Plans

**Modifications to Standard Plans** may be needed in the event that the [Standard Plans](#), as published, do not meet a project specific need. When this occurs the designer may modify a [Standard Plan](#) with approval of District Design Engineer. To facilitate the process, usable CADD drawing files are available on the [Standard Plans](#) website. Furthermore, it must be understood that when **Modifications to Standards Plans** are needed, the modifications must be performed under the direct supervision of a Florida Licensed Professional Engineer and one of the following methods must be used:

- (1) Method 1: Produce a new project specific drawing using the details within the CADD files as a guide or template. In this event, no reference to the related [Standard Plan](#) will be called out in the plans. The details in the plans which were created from the CADD files cease to be a standard and the engineer responsible for the modifications to the drawings becomes the EOR for the application of the entire design.
- (2) Method 2: Modify the details and notes within the CADD files for the project specific requirements. In this event, no reference to the related [Standard Plan](#) will be called out in the plans. It is important that the plans clearly depict evidence that modifications have been made to the original [Standard Plan](#) to avoid any confusion. A plan note indicating the details are based on modifications to the original [Standard Plan](#) may be appropriate. The details in the plans which were created from the CADD file cease to be a standard and the engineer responsible for the modifications to the drawings becomes the EOR for the application of the entire design, including the applicability and correctness of the unaltered portions of the CADD file.
- (3) Method 3: If the required modifications are minor, use the CADD file to create details showing the modifications to the [Standard Plans](#) on a separate sheet in the plans. In this event, reference the related Standard Plans in the Index of Sheets. Place the modified details in the plans on a sheet entitled, "*Modifications to Standard Plans, Index ###-###*". The engineer responsible for the modifications to the [Standard Plan](#) becomes the EOR for the details on this sheet and for all effects the modification has on other components within the [Standard Plans](#).

## 115.2.6 Standard Plans Instructions

The ***Standard Plans Instructions (SPIs)*** provides general instructions to assist the EOR when incorporating the [Standard Plans](#) into the Contract Plans. Instructions including design criteria, usage limitations, plan content requirements, pay item information, and in some cases examples and sample drawings are provided.

Instructions are organized by [Standard Plans](#) Index number and included on the [Standard Plans](#) website adjacent to the associated Index. Some instructions apply to an entire series of Indexes. Instructions for all the Indexes in each respective series are included in the instructions for the lead Index of the series.

It is the responsibility of the EOR using these instructions to determine the applicability of a particular Index in the design of a project. The inappropriate use of and adherence to these instructions does not exempt the engineer from the professional responsibility of developing an appropriate design.

## 115.2.7 Data Tables

Many [Standard Plans](#) require Data Tables that must be completed by the designer and then included in the plans. These Data Tables provide critical information to the contractor that supplements or completes individual [Standard Plans](#). These Data Tables are presented as CADD Cells and are included with the FDOT CADD Software on the "FDOT CADD Bar Menu". Typically, the most current Data Tables cannot be included in the FDOT CADD Software until the next version (or Maintenance Release) following the posting of the yearly [Standard Plans](#) to the website. If the most current Data Tables are needed prior to release of the concurrent version of the FDOT CADD Software, they are available on the Standard Plans website.

Data Tables include a "Table Date" in the upper right corner of each table and may include a "Notes Date" for each set of corresponding notes. Do not change or delete the "Table Date" or "Notes Date" when completing and including the tables and notes in the plans. Use of custom built or recreated versions of the Data Tables (i.e., when the officially issued CADD cell is not used to build a given table) is discouraged. The "Table Date" and "Notes Date" reflects the latest modification of the CADD cell and is intended to be used in a Quality Control process, in conjunction with the ***Standard Plans Instructions***, to confirm that the current Data Table is being used. The "Table Date" or "Notes Date" will not necessarily be the same as the "Last Revision" date shown on the associated [Standard Plans](#) or ***Standard Plans Interim Revision***. The current "Table Date" or "Notes Date" within a given Data Table will be that shown in the ***Standard Plans Instructions***.

### 115.3 Standard Specifications

The governing Specifications for a given project include the [Standards Specifications](#) and any revisions thereto. These revisions typically take the form of Special Provisions, Supplemental Specifications, Modified Special Provisions, Technical Special Provisions and Developmental Specifications. Revisions to the [Standard Specifications](#) are compiled into the **Specifications Package**, which is provided to the Contractor as part of the contract documents.

The process of compiling and formatting the **Specifications Package** is described in the Department's **Specification Package Preparation Procedure (Topic No.: 630-010-005)** and the [Specifications Handbook](#). These documents also include the definitions of the various components along with an explanation of the roles and responsibilities of the different individuals involved (i.e., EOR, District, and Central Office).

The governing [Standard Specifications](#) for every project must be identified in the plans in accordance with **FDM 302**.

These publications are available for download at the State Specification Office's website at: <http://www.fdot.gov/programmanagement/PackagePreparation/Default.shtm>

## 116 Roundabout Evaluation

### 116.1 General

**FDM 213** provides criteria for design of roundabouts on the SHS. These requirements are supplemented by guidance contained in the [\*National Cooperative Highway Research Program \(NCHRP\) Report 672, Roundabouts: An Informational Guide.\*](#)

### 116.2 Roundabout Evaluation

A three-step process has been established to determine if a roundabout is the appropriate control measure for a proposed intersection improvement. Following the completion of the three-step process a final determination of the intersection control to be advanced to design will be made.

For evaluation purposes, the 20-year traffic volumes may be estimated using a growth rate between 1 and 3 percent per year.

SYNCHRO and SIDRA are software packages that are often used to determine performance measures of roundabouts in compliance with the *Highway Capacity Manual*. The preferred software for evaluation and design of roundabouts on the SHS is the SIDRA standard model with environmental factor of 1.1.

#### 116.2.1 Step 1 Screening

This step is intended to quickly assess project-specific conditions to determine the viability of the roundabout alternative. If any of the screening criteria identifies a documented deterrent to the roundabout alternative then advancing to Step 2 Benefit-to-Cost (B-C) Evaluation is optional. However, if none of the Step 1 criteria identifies a deterrent, then the roundabout option must be advanced to Step 2. Certain physical or geometric complications could make it impossible or uneconomical to construct a roundabout.

Step 1 Screening is a checklist of screening criteria that will identify site specific conditions that are inconsistent with the installation or operation of a roundabout. Document the Step 1 Screening using the standard form at the following link:

<http://www.fdot.gov/roadway/FDM/>

The screening criteria are as follows:

- (1) Unfavorable topography or physical constraints (e.g., steep grade, R/W limitations, utility and drainage conflicts,) may limit visibility, complicate construction, or preclude accommodating the design vehicle.
- (2) Major roadway AADT exceeds 90% of the total intersection AADT may cause poor operational performance due to limited gaps for minor road.
- (3) Presence of pedestrians with special needs that may have difficulty crossing the roadway. This would include areas such as schools, retirement homes, trail crossings, parks, or institutions that serve the visually impaired.
- (4) Intersections located within a coordinated signal network. In these situations, the operation of the arterial might be better served with a coordinated signalized intersection incorporated into the system.
- (5) Locations where vehicles exiting the roundabout would be interrupted by downstream conditions. This could include proximity to:
  - (a) Over-capacity signals, freeway entrance ramps, or mid-block pedestrian crossings.
  - (b) Driveways for significant traffic generators
  - (c) Traffic control preemption (e.g., fire stations, railroad tracks, drawbridges)
- (6) Proximity of historical sites, 4(f) sites, or socially significant trees, and the relocation of residences or businesses. These types of impacts would indicate that the project would not qualify as a Type 1 Categorical Exclusion (federally funded) or Non-Major State Action (state funded).

The presence of one or more of these conditions does not preclude the installation of a roundabout. However, the presence of any physical or geometric complications suggests that special attention will be necessary during the evaluation and design of the roundabout alternative.

Upon completion of the Step 1 Screening, a decision is made to either advance the roundabout to Step 2 B-C Evaluation or eliminate it from further consideration. This decision must be approved by the appropriate FDOT representative as follows:

- District Design Engineer for Design projects
- District Traffic Operations Engineer for Traffic Operations Projects

If the decision is to not advance the roundabout alternative, place the signed Step 1 Screening form in the project file. If the decision is to advance the roundabout alternative to the next evaluation step, include the signed form with Step 2 documentation.

## 116.2.2 Step 2 B-C Evaluation

Step 2 B-C Evaluation is a systematic approach to comparing the benefits and costs of a roundabout alternative with a traditional intersection (stop controlled or signal controlled). Benefits are measured in the cost savings associated with a reduced frequency and severity of crashes for each alternative. Costs consider the required investment for each alternative (e.g., R/W, utilities, construction, operation, maintenance). Road user costs can also be included in the analysis if information on driver delay is available. The Step 2 B-C Evaluation spreadsheet and supporting documentation can be downloaded at:

<http://www.fdot.gov/roadway/FDM/>

The Step 2 spreadsheet analysis provides a B-C ratio that indicates whether or not the roundabout alternative delivers a return on investment over the traditional intersection. A B-C ratio greater than 1.0 indicates that a roundabout is economically warranted.

At the completion of Step 2 B-C Evaluation, the District Traffic Operations Engineer or District Design Engineer will approve or deny the decision to advance the roundabout alternative to Step 3 Geometric and Operational Analysis.

A summary form with signature block is included in the spreadsheet under the "Step 2 Form" tab. If the decision is to not advance the roundabout alternative, place the Step 1 and Step 2 signed forms in the project file. If the decision is to advance the roundabout alternative to the next step, include the Step 1 and Step 2 signed forms with Step 3 documentation.

## 116.2.3 Step 3 Geometric and Operational Analysis

The Step 3 Geometric and Operational Analysis includes a preliminary design that establishes the roundabout alignment, geometry, and lane requirements. The preliminary design must meet sight distance criteria, accommodate all turning movements of the design vehicle, and control the operating speed of entering, circulating, and exiting traffic. The Step 3 Geometric and Operational Analysis form can be downloaded at:

<http://www.fdot.gov/roadway/FDM/>

An operational analysis is conducted to determine if the roundabout will accommodate projected traffic volumes at an acceptable level of service (LOS). Roundabout LOS is measured in control delay consistent with other unsignalized intersections.

Required data for the analysis includes the following:



- (1) The number and configuration of lanes on each approach
- (2) Either of the following:
  - (a) Demand volumes for each entering vehicular turning movement and each pedestrian crossing movement during the peak 15 minutes, or
  - (b) Demand volumes for each entering vehicular turning movement and each pedestrian crossing movement during the peak hour, and a peak hour factor for the hour
- (3) Percentage of trucks
- (4) Volume distribution across lanes for 2-lane entries
- (5) Length of analysis period, generally a peak 15-minute period within the peak hour

In cases where a roundabout, all-way stop, or signalized intersection would be located within a half mile of the roundabout being evaluated, a systems-level operational analysis should be completed using software specifically designed for roundabouts in a system.

### 116.3 Roundabout Summary Report

Document Step 3 in a Roundabout Summary Report that includes the following:

- (1) **Cover Sheet:** Describe the project purpose and need and how the roundabout alternative would address these issues. Include a summary of the results from Step 1 Screening, Step 2 B-C Evaluation, and Step 3 Geometric and Operational Analysis. The standard form also contains a check box to indicate whether or not the roundabout will be advanced to final design. The signatures of the District Traffic Operations Engineer and the District Design Engineer are required.
- (2) **Operational Analysis:** Include the results of the analysis. Present by lane group in terms of volume-to-capacity ratio, average control delay, level of service, and 95th percentile queue. Use Department-approved 20-year traffic projections for morning and afternoon peak hours for the design year analysis.
- (3) **Geometric Performance Checks:** Include documentation for sight distance, swept path, and fastest path performance checks. Indicate the selected design vehicle.
- (4) **Preliminary Roundabout Design:** Include a plan sheet of the conceptual geometric layout and alignment of the circulatory roadway and approaches using either a scaled aerial or topographic data. Label the dimensions for major geometric components, including splitter islands, circulatory roadway, truck

aprons, center island, and bypass lanes (if required). Also include the following on the plan sheet:

- (a) Significant topographic features; e.g., buildings, driveways, drainage structures, utilities, bicycle, pedestrian, and transit facilities.
  - (b) Existing and proposed R/W lines
- (5) **Step 1 and Step 2 signed forms**: Include signed forms from Step 1 and Step 2 as well as the crash data used to complete the Step 2 evaluation.

## 120 Design Submittals

### 120.1 General

The design process will require various submittals to transfer technical information and decisions between the Engineer of Record (EOR), certain Department personnel, and functional areas. The Department Project Manager is responsible for the adequacy of the submittals or requests and for the coordination of reviews between the Department and the EOR. Each office head including the District Construction and Maintenance Engineers should assume direct responsibility for assigning reviewers and meeting the review schedules. To the extent practical, the contract scope of work should list the information to be furnished by FDOT functional areas and submittals (number and type) required of the EOR. **Figure 120.1.1**, shown on the following page, is a partial list of functional areas with typical submittals and requests.

During the design process, various items of information may be required from different sections or departments. The following is a list of some of those items and their source:

**Figure 120.1.1 List of Requests and Contacts  
Sheet 1 of 2**

**A) Planning**

Request pavement design (18 Kip ESAL)  
Request project traffic data  
Request turning movements for intersections  
Request updates of project traffic data (as needed)  
Railroad contact (Phase I and III)  
Plans transmittal letter data (railroad)  
Notification that project is in vicinity of a traffic monitoring site

**B) Traffic Plans/Traffic Operations**

Request turns and counts for intersection design  
Notification that project includes milling  
Signing & pavement marking plans (Phase I, II, III)  
Traffic signal plans (Phase I, II, III) & signal warrant  
Lighting plans (Phase I, II) & justification report  
Pedestrian and bicycle project traffic  
Safety/crash analysis and recommendations  
Operational and capacity review of design plans

**C) Geotechnical**

Request pavement design soil information  
Request roadway soil survey  
Soils data  
Request foundation investigations  
Request dynaflect testing  
Phase III review, if unsuitable soils exist.  
Soils and foundation recommendations  
PH and soils resistivity for culvert material selection  
Request pavement composition and milling recommendations  
Review if any changes are made in alignment, grade or typical section.  
Bridge Geotechnical Report

**D) Surveying and Mapping**

Request survey

**E) Drainage**

Request grade and high water review  
Conceptual drainage plan & assumptions  
Bridge Hydraulics Report  
Request drainage design  
Request final drainage review  
Permit review  
SWPPP  
Erosion Control Plan

**F) Maintenance**

Pavement design comments  
Phase I Plans review & response  
Phase II Plans review & response  
Phase III Plans review & response

**G) Construction**

Pavement design comments  
Phase I Plans review & response  
Phase II Plans review (constructability) & response  
Phase III Plans review (biddability) & response  
Submit traffic control plan request  
Contract time

**H) R/W Surveying and Mapping**

Submit title search request  
Request existing right of way maps  
Transmit right of way requirements  
Final right of way check  
Plans transmittal letter data

**I) Utilities**

Preliminary (First) contact (Phase I)  
Pre-Design conference and contact (Phase II)  
Final contact (Phase III)  
Horizontal and vertical verification of utilities  
Plans transmittal letter data (utilities)  
Number of sets of final prints for utility companies

**Figure 120.1.1 List of Requests and Contacts  
Sheet 2 of 2**

**J) Estimates and Specifications**

Preliminary estimate (LRE)  
Preliminary estimate (Phase I)  
Preliminary estimate (Phase II)  
Preliminary estimate (Phase III)  
Complete estimate (Phase IV)

**K) Right Of Way Department**

Project schedule updates as needed  
R/W estimates as needed  
Pre-Proposal appraisal conference  
Field questions from R/W agents as needed  
Plans transmittal letter data  
Phase I Plans Review (by Appraiser)  
Phase II Plans Review (by Appraiser)  
Phase III Plans Review (by Appraiser)  
Phase IV Plans Review (by Appraiser)

**L) FHWA (if Project of Division Interest (PoDI))**

Phase I Plans review & response  
Phase II Plans review & response  
Phase III Plans review & response  
Phase IV Plans review & response  
Submit for typical section approval  
Submit for pavement design approval  
Submit Design Exception request letters  
R/W review  
Submit Proprietary Product Certification Request

**M) Value Engineering (\$25,000,000+)**

Phase I & II reviews

**N) Environmental**

Contamination Evaluation  
SWPPP  
Erosion Control Plan  
Mitigation Plans  
Asbestos-Containing Materials Survey  
Phase I Plans review & response  
Phase II Plans review & response  
Phase III Plans review & response  
Phase IV Plans review & response  
PD&E Re-evaluation  
Project Commitment Record  
Preliminary Engineering Report (as applicable)  
Approved Environmental Document (as applicable)

**O) Materials**

Environmental Classifications  
Type of Structural Steel (existing)  
Existence of Lead-Based Paint

**P) Bridge**

Phase I, Bridge Analysis, review & response  
Phase II Plans review & response  
BDR/30% Plans review and response  
60% Plans review & response  
90% Plans review & response  
100% Plans review & response

**Q) Public Transportation/Modal Development**

Notification that project contains a transit route  
Request transit agency contact(s)  
Request facility locations and information  
Identify any special transit needs  
Phase I Plans review & response  
Phase II Plans review & response  
Phase III Plans review & response  
Number of sets of final prints for transit agencies

**R) Landscape**

Notification of Local Agency for landscape coordination and agreements  
Existing Vegetation Inventory and Disposition  
Landscape Opportunity Plan or Concept Plan  
Soils Analysis, existing and proposed  
Irrigation Feasibility Study

Modification for Non-Conventional Projects:

Delete **FDM 120.1** above and replace with the following:

See **FDM 301** for a list of submittal requirements.

## 120.2 Design Documentation Submittals

Certain engineering processes require the submittal of information to specific Department personnel for the purpose of making timely decisions and confirming project objectives. Submittals will take place as these activities are completed so that issues do not go unresolved before subsequent activities begin. The following are submittals that should take place during initial engineering. Ideally these engineering type submittals are done in lieu of traditional phase plans reviews.

### 120.2.1 Field Survey Data

Evaluate the following typical field survey data for sufficient breadth and accuracy to complete the proposed design. Bring deficiencies to the attention of the Department.

- (1) Design location survey data including horizontal and vertical control, alignments, reference points, utilities, natural and manmade features, and topography or general shape of the terrain.
- (2) Digitized aerial survey data, especially for large areas such as drainage maps. Drainage design survey data from site inspection and historical records.
- (3) Right of Way and related property (land) survey data, including property owners and acreage.
- (4) Geotechnical studies and foundation and soils report, including physical properties and classifications of soils, together with recommendations related to foundations, pavement and drainage design.
- (5) Bridge data sheet surveys, channel alignment survey data, and bathymetric data.

### 120.2.2 Traffic Data

In the development of roadway plans, traffic data is used to justify:

- Number of through lanes,
- Geometric improvements to intersections,
- Traffic signal timings, and
- Pavement design.

The number of through lanes is usually determined during the project development phase, based on Annual Average Daily Traffic (AADT) and factors included in the typical section. Vehicular traffic data shown on the plans Typical Section sheet includes:

- AADT for the current year, opening year and the design year
- Design hour factor (K is the Department's Standard "K" factor as provided by the State Transportation Statistics Office),
- Directional distribution (D is the percent of two way peak hour traffic that occurs in the peak direction), and
- Truck factors (T is the percent that trucks constitute of vehicular traffic) for the peak hour and a 24 hour period.

The source and methods used to produce this data must be documented.

### **120.2.2.1 Traffic Counts**

Intersection improvements and signal timings require additional information on turning volumes. The [\*\*FDOT Project Traffic Forecasting Procedure \(Topic No.: 525-030-120\)\*\*](#) describes the input data required, explains the procedure to forecast turning volumes, and provides examples. A Project Traffic Report will be required. Traffic counts provide input on the number of motor vehicles, bicycles and pedestrians using an intersection. At proposed (non-existing) major intersections, turning volumes are estimated using transportation planning models or other means. Forecasts provide designers the information required to determine the need for turning lanes, turning bay length, signal timings, and pedestrian crossings. Also, the designer establishes right of way requirements based on documented needs to satisfy design year volumes.

### **120.2.2.2 18 kip Equivalent Single Axle Loads (ESAL)**

In pavement design, the designer requires AADT forecasts for the year a project opens to traffic and for the design year. AADT, together with percent trucks (24-hour period) and other factors used by the Department, provides information on the pavement loadings (18kip ESAL) used in pavement design. The FDOT Project Traffic Forecasting Procedure provides additional information.

### **120.2.3 Typical Section Package**

The purpose of the typical section package is to establish and document the following:

- Project Controls
- Cross Sectional Elements
- Design Variations and Design Exceptions

Prepare a typical section package for projects that alter cross section elements and for resurfacing projects. The typical section package must be prepared and sealed by the EOR.

There are two formats available in the FDOT CADD Software for the development of typical section packages:

1. Digitally signed and sealed Typical Section Packages as described in this chapter. The Typical Section Package consists of a Cover Sheet and Proposed Typical Section Sheets as illustrated in **Exhibits 120-1** through **120-4**.
2. 2017 PPM Typical Section Packages as described in PPM Volume 1, Chapter 16. This format may be used for projects that do not require context classification and are manually signed and sealed.

#### **120.2.3.1 Approval Process**

The typical section package will be approved as part of the Project Development & Environment (PD&E) process. Typical section package preparation and coordination between the responsible PD&E Engineer of Record (EOR) and the District Design Engineer typically occurs during the development of project alternatives prior to the preferred alternative selection. The PD&E EOR will prepare, seal, and submit the typical section package for concurrence. Typical section concurrence signatures are obtained



after the preferred alternative is selected. Include a copy of the approved typical section package as part of the PD&E Final Preliminary Engineering Report.

For projects that do not contain a PD&E phase or have significantly changed during the design process, the typical section package is prepared, sealed and submitted by the Design EOR. Typical section package concurrence signatures should be obtained prior to the final engineering process.

### 120.2.3.2 Cover Sheet

The Cover Sheet contains the following:

- (1) Project Identification: Place the Financial Project ID number(s) immediately under the heading "TYPICAL SECTION PACKAGE" at the top of the sheet. When the project involves Federal funds, place the words "(Federal Funds)" under the Financial Project ID. Place the county name and roadway section number associated with the Straight Line Diagrams under the Financial Project ID or "(Federal Funds)". Include a description of work type under the state road number.
- (2) Project location map: See **FDM 302.4** for requirements.
- (3) PD&E or Design EOR Signature Block: See **FDM 130** for requirements.
- (4) Sheet Index: Provide an index of sheets contained in the package that the EOR is responsible for.
- (5) Typical Section Concurrence Block: Concurrence from the District Design Engineers for all typical sections is required. Other concurrence signatures may be included; e.g., District Structures Design Engineer for bridge typical sections, County Engineer for local roadway typical sections.
- (6) Concurrence of the typical section package by the FHWA Transportation Engineer is required on Projects of Division Interest (PoDI). Refer to **FDM 125** for additional information concerning PoDIs.
- (7) Design Speed and Posted Speed Concurrence Block: The District Design Engineer and District Traffic Operations Engineer will discuss and agree to the posted speed. The selected design speed will be jointly approved by the District Design Engineer and the District Traffic Operations Engineer with a declaration that the posted speed is not expected to exceed the selected design speed.
- (8) Context Classification Concurrence Block: Context classification is determined by FDOT district staff on all projects. Coordinate with the FDOT Project Manager to obtain context classification(s). Concurrence from the District Intermodal Systems Development (ISD) Manager or Planning and Environmental Management

Administrator for the context classification assigned to each typical section is required.

### **120.2.3.3 Typical Section Sheet**

Provide Typical Section Sheets for the state roadway and bridges for project limits that include:

- A change in the number of through lanes.
- A change in Project Controls; Functional Classification, Context Classification, or Design Speed
- Change in facility type; e.g. flush shoulder roadway to curbed roadway.
- A crossroad which may affect an existing structure.

Provide Typical Section Sheets for intersecting roadways when work of significant length is required.

Provide Typical Section Sheets for each proposed electronic toll point on toll facilities. These typical sections are intended to represent the required 100 feet of loop pavement underneath the toll gantry.

The Proposed Typical Section Sheet contains the following:

- (1) Project Controls: Indicate the applicable control that applies to the typical section (context classification, functional classification, highway system, and access classification).
- (2) Criteria: Indicate the type of construction.
- (3) Design Variations and Design Exceptions: List anticipated Exceptions and Variations that relate to the typical section.
- (4) Traffic Data: provide the following,
  - (a) Current Year and AADT
  - (b) Estimated Opening Year and AADT
  - (c) Estimated Design Year and AADT
  - (d) K, D, T (24 hour) factors.
  - (e) Design Year T factor
  - (f) Design Speed and Posted Speed

- (5) Roadway Typical Section Drawing: provide the following,
- (a) Name of Roadway and Mile Post Limits (station limits or street names may be used when Mile Post data is not available).
  - (b) Centerline Construction and/or Baseline Survey (label)
  - (c) Lanes (label type, dimension width, show cross slope)
  - (d) R/W Line (graphically show, label and dimension from centerline const.)
  - (e) Shoulder (label and dimension width, show cross slope, paved shoulder is dimensioned and labeled separately)
  - (f) Curb (graphically show curb, label curb type)
  - (g) Median (graphically show median, dimension width, show slopes)
  - (h) Slopes (label and dimension)
  - (i) Border Width (label and dimension for new construction / reconstruction)
  - (j) Ditches (show typical front slope and typical back slope, dimension typical ditch width and depth, and label)
  - (k) Natural Ground Line (graphically show and label)
  - (l) Pavement and Roadbed (graphically show)
  - (m) Barriers (graphically show, dimension, and label)
  - (n) Sidewalk or Shared Use Path (graphically show, dimension width, and label)
- (6) Bridge Typical Section Drawing: provide the following,
- (a) Bridge Description w/ Crossing Information
  - (b) Centerline Construction and/or Baseline Survey (label)
  - (c) Lanes (label type, dimension width, show cross slope)
  - (d) R/W Line (graphically show, label and dimension from centerline const.)
  - (e) Shoulder (label and dimension width, show cross slope)
  - (f) Gutter (graphically show, dimension width)
  - (g) Median (graphically show, dimension width)
  - (h) Barriers (graphically show including railing, dimension width, and label)

Sidewalk or Shared Use Path (graphically show, dimension width, and label)

STATE OF FLORIDA  
DEPARTMENT OF TRANSPORTATION

TYPICAL SECTION PACKAGE

FINANCIAL PROJECT ID 123456-1-52-01

BAY COUNTY (46080)

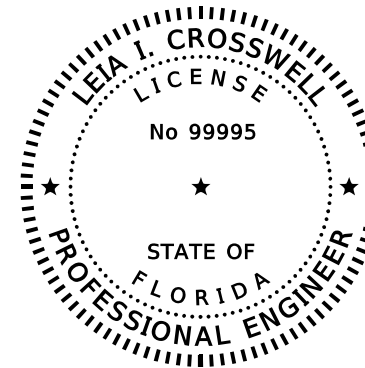
STATE ROAD NO. 22 (WEWA HWY)

RECONSTRUCTION OF SR 22 FROM 2-LANE TO 4-LANE

APPROVED BY:

THIS DOCUMENT HAS BEEN DIGITALLY  
SIGNED AND SEALED BY:

**LEIA I. CROSSWELL**  
**Date: 2017.10.09**  
**16:40:48 - 4'00'**



PRINTED COPIES OF THIS DOCUMENT ARE  
NOT CONSIDERED SIGNED AND SEALED.  
THE SIGNATURE MUST BE VERIFIED  
ON THE ELECTRONIC DOCUMENTS.

ROADWAY ENGINEERS, INC.  
123 MAIN STREET  
TALLAHASSEE, FL 32301  
CERTIFICATE OF AUTHORIZATION: 12345  
LEIA I. CROSSWELL, P.E. NO. 99995

THE ABOVE NAMED PROFESSIONAL ENGINEER SHALL BE RESPONSIBLE FOR THE  
FOLLOWING SHEETS IN ACCORDANCE WITH RULE 61G15-23.004, F.A.C.

TYPICAL SECTION PACKAGE

SHEET NO	SHEET DESCRIPTION
1	COVER SHEET
2	TYPICAL SECTION NO. 1
3	TYPICAL SECTION NO. 2
4	TYPICAL SECTION NO. 3

Exhibit 120-1  
Date: 1/1/18

TYPICAL SECTION CONCURRENCE

**LAN B. SOLO**  
**Date: 2017.10.11**  
**08:11:45 - 4'00'**

FDOT DISTRICT DESIGN ENGINEER

**J.T. HUTT**  
**Date: 2017.10.10**  
**15:11:45 - 4'00'**

FDOT DISTRICT STRUCTURES  
DESIGN ENGINEER

FHWA TRANSPORTATION ENGINEER

DESIGN SPEED AND POSTED  
SPEED CONCURRENCE:

**GARTH PAUL**  
**Date: 2017.10.10**  
**14:10:15 - 4'00'**

FDOT DISTRICT TRAFFIC OPERATIONS  
ENGINEER

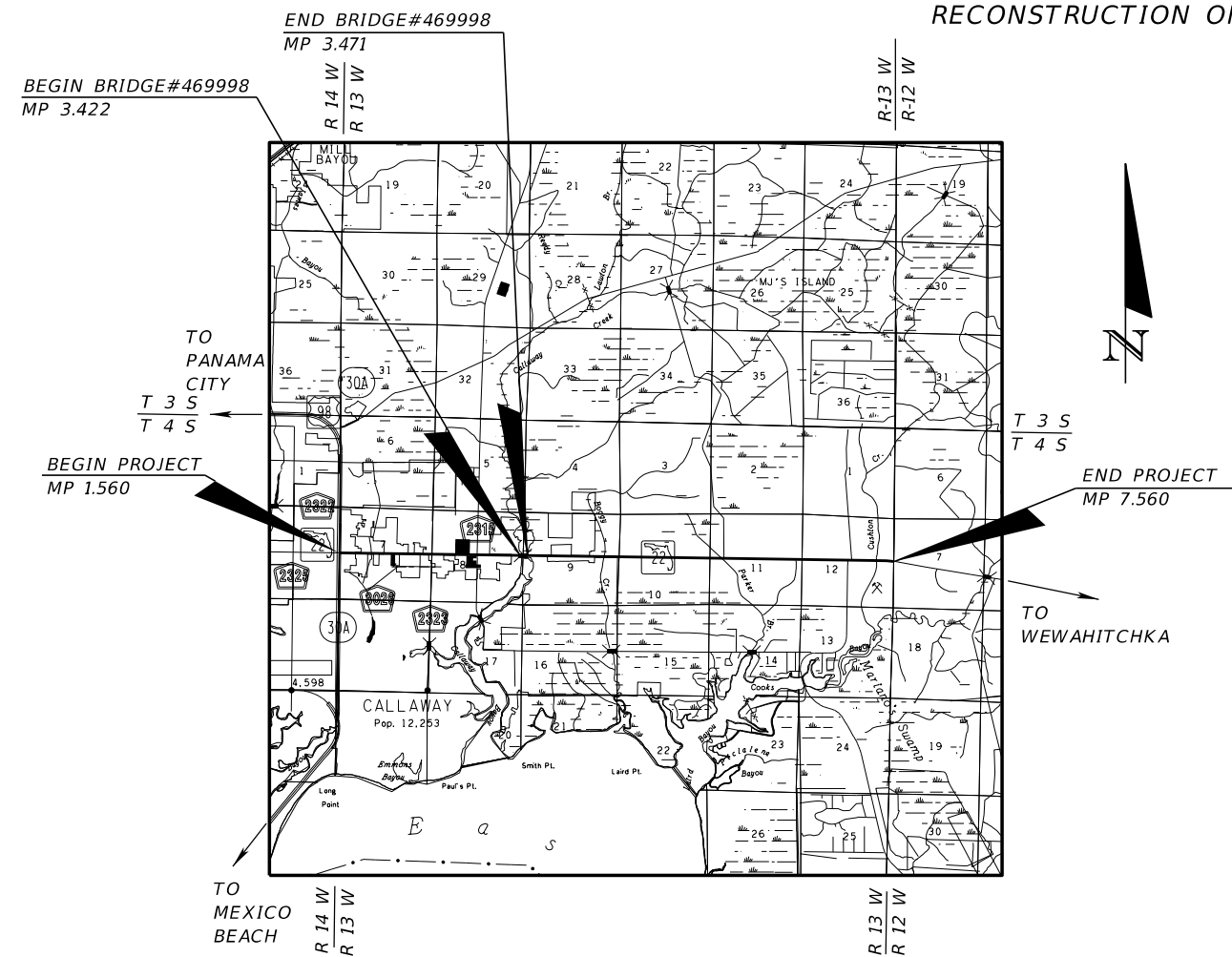
**LAN B. SOLO**  
**Date: 2017.10.11**  
**08:12:33 - 4'00'**

FDOT DISTRICT DESIGN ENGINEER

CONTEXT CLASSIFICATION  
CONCURRENCE:

**REY-REY OLAY**  
**Date: 2017.10.10**  
**12:01:30 - 4'00'**

FDOT DISTRICT INTERMODAL SYSTEMS  
DEVELOPMENT MANAGER



**PROJECT CONTROLS**

**CONTEXT CLASSIFICATION**

- ( ) C1 : NATURAL            ( ) C3C : SUBURBAN COMM.
- ( ) C2 : RURAL             ( ) C4 : URBAN GENERAL
- ( ) C2T : RURAL TOWN    ( ) C5 : URBAN CENTER
- (X) C3R : SUBURBAN RES. ( ) C6 : URBAN CORE
- ( ) N/A : L.A. FACILITY

**FUNCTIONAL CLASSIFICATION**

- ( ) INTERSTATE            ( ) MAJOR COLLECTOR
- ( ) FREEWAY/EXPWY.    ( ) MINOR COLLECTOR
- (X) PRINCIPAL ARTERIAL ( ) LOCAL
- ( ) MINOR ARTERIAL

**HIGHWAY SYSTEM**

- ( ) NATIONAL HIGHWAY SYSTEM
- ( ) STRATEGIC INTERMODAL SYSTEM
- (X) STATE HIGHWAY SYSTEM
- ( ) OFF-STATE HIGHWAY SYSTEM

**ACCESS CLASSIFICATION**

- ( ) 1 - FREEWAY
- ( ) 2 - RESTRICTIVE w/Service Roads
- ( ) 3 - RESTRICTIVE w/660 ft. Connection Spacing
- (X) 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
- ( ) 5 - RESTRICTIVE w/440 ft. Connection Spacing
- ( ) 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
- ( ) 7 - BOTH MEDIAN TYPES

**CRITERIA**

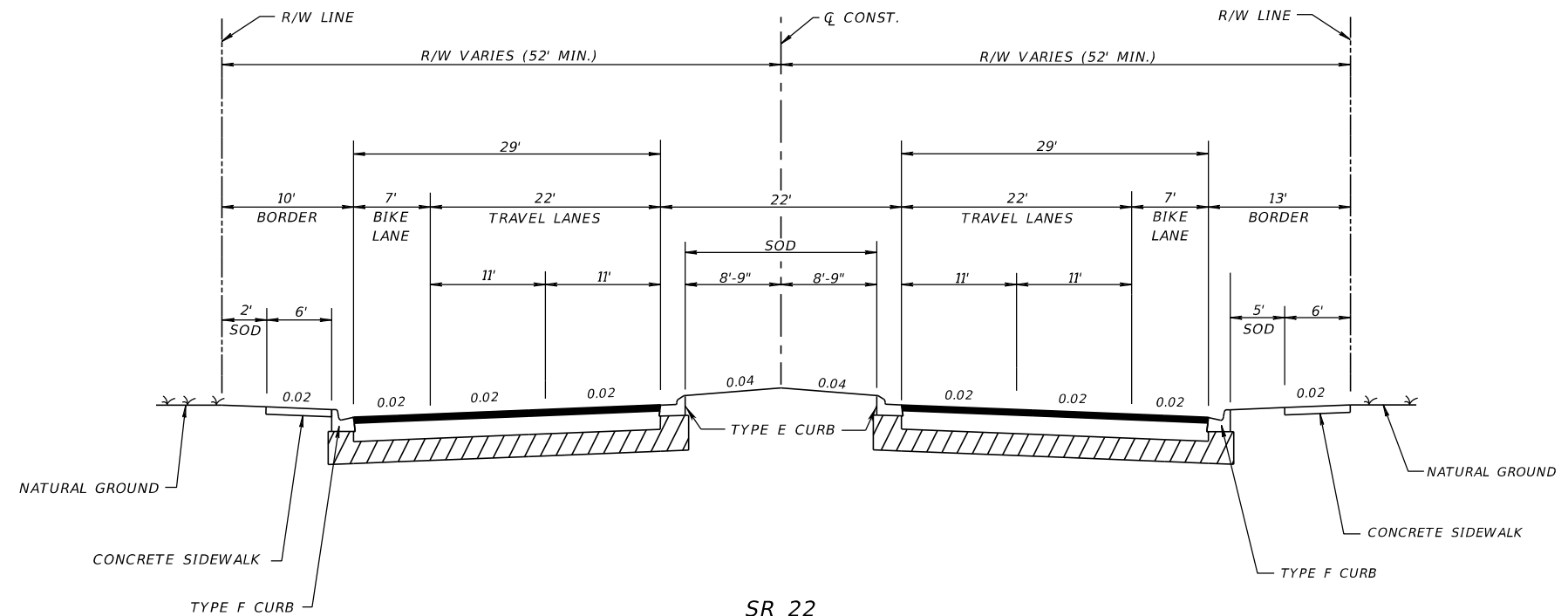
- (X) NEW CONSTRUCTION / RECONSTRUCTION
- ( ) RESURFACING (LA FACILITIES)
- ( ) RRR (ARTERIALS & COLLECTORS)

**POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:**

DESIGN VARIATIONS

- 1. BORDER WIDTH

**TYPICAL SECTION No. 1**



SR 22  
MP 1.560 TO MP 3.422  
MP 3.471 TO MP 3.725

**TRAFFIC DATA**

CURRENT YEAR = 2018 AADT = 22800  
 ESTIMATED OPENING YEAR = 2020 AADT = 25800  
 ESTIMATED DESIGN YEAR = 2040 AADT = 30600  
 K = 6% D = 55% T = 2% (24 HOUR)  
 DESIGN HOUR T = 1%  
 DESIGN SPEED = 35 MPH  
 POSTED SPEED = 30 MPH

**NOT TO SCALE**

Exhibit 120-2  
Date: 1/1/18

FINANCIAL PROJECT ID	SHEET NO.
123456-1-52-01	2

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

**PROJECT CONTROLS**

CONTEXT CLASSIFICATION

- ( ) C1 : NATURAL            ( ) C3C : SUBURBAN COMM.
- ( ) C2 : RURAL             ( ) C4 : URBAN GENERAL
- ( ) C2T : RURAL TOWN    ( ) C5 : URBAN CENTER
- (X) C3R : SUBURBAN RES. ( ) C6 : URBAN CORE
- ( ) N/A : L.A. FACILITY

FUNCTIONAL CLASSIFICATION

- ( ) INTERSTATE            ( ) MAJOR COLLECTOR
- ( ) FREEWAY/EXPWY.    ( ) MINOR COLLECTOR
- (X) PRINCIPAL ARTERIAL ( ) LOCAL
- ( ) MINOR ARTERIAL

HIGHWAY SYSTEM

- ( ) NATIONAL HIGHWAY SYSTEM
- ( ) STRATEGIC INTERMODAL SYSTEM
- (X) STATE HIGHWAY SYSTEM
- ( ) OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

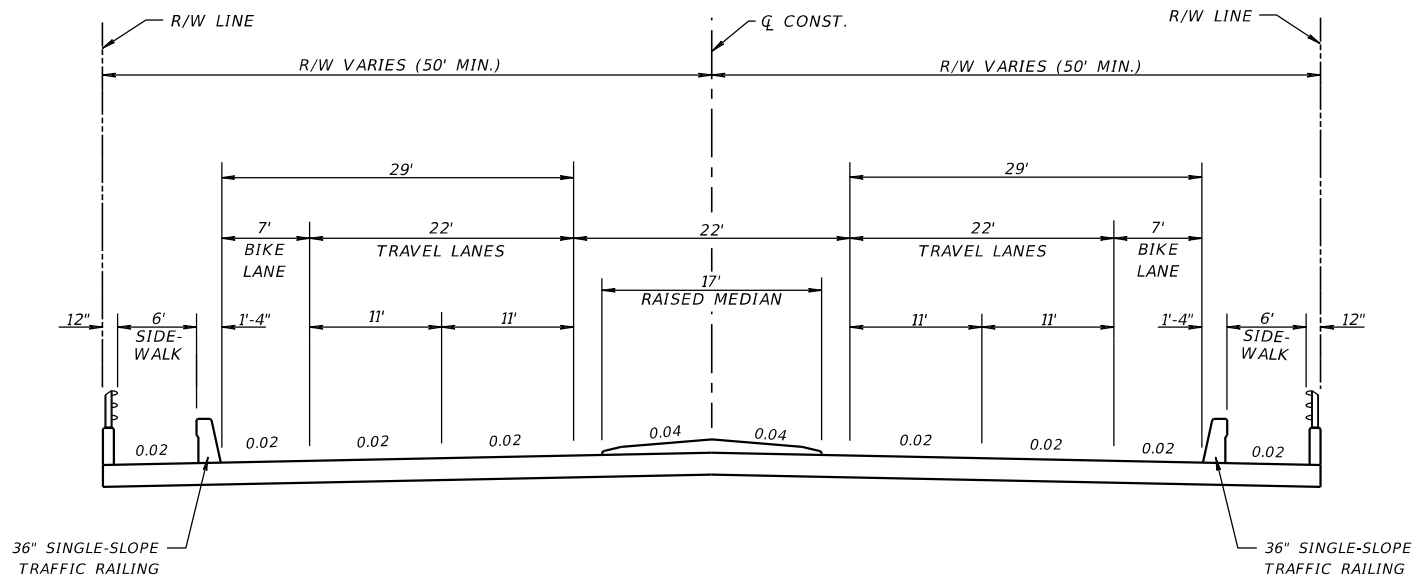
- ( ) 1 - FREEWAY
- ( ) 2 - RESTRICTIVE w/Service Roads
- ( ) 3 - RESTRICTIVE w/660 ft. Connection Spacing
- (X) 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
- ( ) 5 - RESTRICTIVE w/440 ft. Connection Spacing
- ( ) 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
- ( ) 7 - BOTH MEDIAN TYPES

CRITERIA

- (X) NEW CONSTRUCTION / RECONSTRUCTION
- ( ) RESURFACING (LA FACILITIES)
- ( ) RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

**TYPICAL SECTION No. 2**



TRAFFIC DATA

CURRENT YEAR = 2018 AADT = 22800  
 ESTIMATED OPENING YEAR = 2020 AADT = 25800  
 ESTIMATED DESIGN YEAR = 2040 AADT = 30600  
 K = 6% D = 55% T = 2% (24 HOUR)  
 DESIGN HOUR T = 1%  
 DESIGN SPEED = 35 MPH  
 POSTED SPEED = 30 MPH

SR 22 OVER CALLAWAY BAYOU  
 MP 3.422 TO MP 3.471

NOT TO SCALE

Exhibit 120-3  
 Date: 1/1/18

FINANCIAL PROJECT ID	SHEET NO.
123456-1-52-01	3

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**PROJECT CONTROLS**

CONTEXT CLASSIFICATION

- ( ) C1 : NATURAL                      ( ) C3C : SUBURBAN COMM.
- (X) C2 : RURAL                        ( ) C4 : URBAN GENERAL
- ( ) C2T : RURAL TOWN            ( ) C5 : URBAN CENTER
- ( ) C3R : SUBURBAN RES.        ( ) C6 : URBAN CORE
- ( ) N/A : L.A. FACILITY

FUNCTIONAL CLASSIFICATION

- ( ) INTERSTATE                      ( ) MAJOR COLLECTOR
- ( ) FREEWAY/EXPWY.            ( ) MINOR COLLECTOR
- (X) PRINCIPAL ARTERIAL        ( ) LOCAL
- ( ) MINOR ARTERIAL

HIGHWAY SYSTEM

- ( ) NATIONAL HIGHWAY SYSTEM
- ( ) STRATEGIC INTERMODAL SYSTEM
- (X) STATE HIGHWAY SYSTEM
- ( ) OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

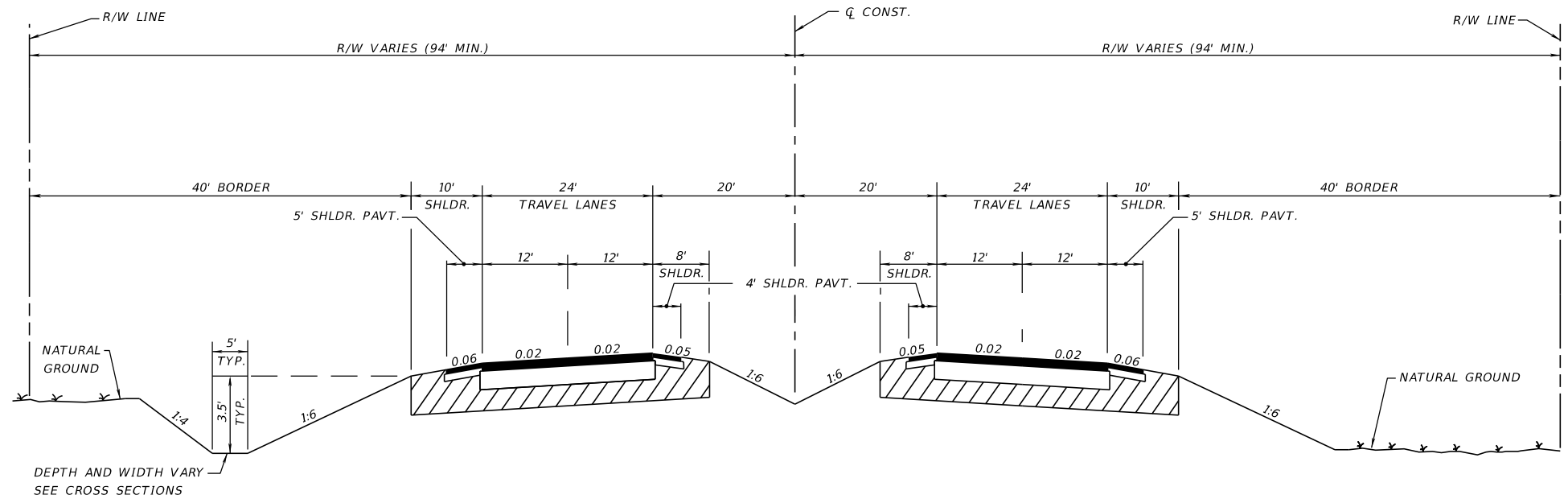
- ( ) 1 - FREEWAY
- ( ) 2 - RESTRICTIVE w/Service Roads
- ( ) 3 - RESTRICTIVE w/660 ft. Connection Spacing
- (X) 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
- ( ) 5 - RESTRICTIVE w/440 ft. Connection Spacing
- ( ) 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
- ( ) 7 - BOTH MEDIAN TYPES

CRITERIA

- (X) NEW CONSTRUCTION / RECONSTRUCTION
- ( ) RESURFACING (LA FACILITIES)
- ( ) RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

**TYPICAL SECTION No. 3**



SR 22  
MP 3.725 TO MP 7.560

TRAFFIC DATA

CURRENT YEAR = 2018 AADT = 22800  
 ESTIMATED OPENING YEAR = 2020 AADT = 25800  
 ESTIMATED DESIGN YEAR = 2040 AADT = 30600  
 K = 6% D = 55% T = 2% (24 HOUR)  
 DESIGN HOUR T = 1%  
 DESIGN SPEED = 60 MPH  
 POSTED SPEED = 55 MPH

NOT TO SCALE

Exhibit 120-4  
Date: 1/1/18

FINANCIAL PROJECT ID	SHEET NO.
123456-1-52-01	4

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## **120.2.4 Preliminary Drainage Design**

On projects where the drainage design is a critical element the following items should require a preliminary submittal:

- (1) Determination of water elevations affecting the roadway grade. These include base clearance water elevations and design flood elevations.
- (2) Pond Siting Report
- (3) Documentation of preliminary drainage coordination with permitting agencies
- (4) Information that is essential to proper evaluation of drainage design concepts such as seasonal high ground water, soil types, existing cross drain peak design stages, historical pavement failure, floodplain elevation, present water elevations, and drainage areas.
- (5) Documentation of coordination with the Landscape Architect and District Maintenance Engineer regarding aesthetics, including the accommodation of existing and proposed trees, particularly where additional R/W or Design Exceptions or Design Variations may be required.

## **120.2.5 Preliminary Geometry and Grades**

On projects where connections to the facility make grades a critical element, back of sidewalk profiles, project profile grades, determination of water elevations affecting the roadway grade, and driveway and side street geometry should require a preliminary submittal. The Department may require the designer to present the project geometry and grade to a geometry and grade technical review team to encourage productive dialogue and proper communication regarding these design issues. If a bridge exists within the project limits, the early input of the structural designer as to approach grades and clearance needs should be coordinated to ensure proper bridge design.

## **120.2.6 Preliminary Traffic Control Plan**

On projects where the traffic control plan is a critical element the following items should require a preliminary submittal.

- (1) Typical sections of each construction phase with information that is essential to proper evaluation of each construction phase; e.g., location and nature of proper construction drainage; regulatory speed; location of work zone; proposed traffic control devices; number, width and location of maintained traffic; maximum drop-off; maintenance of existing lighting.



- (2) Documentation addressing possible innovative construction techniques; e.g., need for temporary detours, hazardous material excavation, temporary structures.
- (3) Documentation of coordination with the local community; e.g., city and county transportation engineers, businesses, police, hospitals, civic centers or arena operations, fire department, schools, mass transit.
- (4) When a temporary bridge is used, the designer must coordinate with the State Bridge Evaluation Engineer in Tallahassee (Office of Maintenance) to ensure that a detour route for overweight vehicles is included in the plans. If no detour route is available, the temporary bridge may have to be designed to support multi-trip overweight vehicles.

### **120.2.7 Pavement Selection and Design**

The pavement selection and design should be completed as early in the process as possible. The Rigid and Flexible Pavement Design Manuals are available through [Pavement Management Publications](#).

### **120.2.8 Preliminary Utilities**

On projects where utility coordination is a critical element the following early involvement activities should be required.

- (1) Prior to Phase I plans submittal, early involvement can be obtained by coordinating a review of the utility information in the topographic survey. This review may be accomplished by distribution of the topographic survey to all Utility Agency/Owners (UAOs) through the District Utility Office for mark-ups and confirmation of existing facilities.
- (2) Once the designer has reviewed the early topographic survey mark-ups a meeting should be held with the UAOs, District Utility Office and the designer to discuss errors, omissions, and future plans of the utilities already identified within the corridor. This will allow the designer the ability to prioritize which utilities will ultimately impact the design.

### **120.3 Structures Submittals**

Structures design elements go through decision-making reviews at various stages of the design as listed below:

### **120.3.1 Coordination of Structural Design - (Bridges and Retaining Walls)**

Requests for structural design should include roadway plan and profile sheets showing horizontal and vertical alignment and cross sections within 500 feet of each end of the bridge or ends of retaining walls. Horizontal curvature that is on or near the end of the bridge or retaining wall must be shown. Nonstandard superelevation transition details or other special profiles must be included if any part or all of the transition is on the bridge or wall. The approved proposed typical section is required.

Provisions for access to property near the end of bridges and adjustments to avoid costly right of way takings should be resolved.

### **120.3.2 Bridges**

Bridge design begins when the Phase I bridge geotechnical report is complete and proceeds on a schedule which allows simultaneous review of the final (90%) bridge plans and the Phase III roadway plans. All structures design work is coordinated through the District Structures Design Engineer or the State Structures Design Office in the Central Office, depending on the category or complexity of the structure. Determine the typical section of the facility crossing, the horizontal and vertical clearance requirements, and the profile grades prior to beginning structures design. For complete details and requirements for structural designs and plans preparation, the reader is referred to **FDM 121** and the Structures Detailing Manual issued by the State Structures Design Office.

Generally, the completion and review of bridge designs are accomplished in the following phases:

- (1) BDR/30% Structures Plans
- (2) 60% Structures Plans
  - (a) (Foundation submittal for all Structures and full submittal)
  - (b) (Full submittal for Category 2 or unusual structures only)
- (3) 90% Structures Plans
- (4) 100% Structures Plans

These reviews should be coordinated with the phase reviews of the roadway plans. Submit the latest set of structural plans with the Phase II roadway plans submittal. This joint submittal at Phase II roadway plans review is to ensure that roadway and bridge

structures plans are consistent; i.e., widths, superelevation transitions, vertical and horizontal alignment, and work zone traffic control agree. The precise number and type of plans submittals depends on the complexity of the design and the sensitivity of the project. Each submittal must include written responses to the comments received on the previous submittal.

Modification for Non-Conventional Projects:

Delete **FDM 120.3.2** above and replace with the following:

### **120.3.2 Bridges**

For bridge submittal requirements see RFP and **FDM 121**.

### **120.3.3 Other Structural Submittals and Reviews**

In addition to bridge plans, structures plans may include retaining walls, sheet piling, noise barriers, box or three-sided culverts, pedestrian overpasses, temporary bridges, and special structural appurtenances. Special structural appurtenances that include transit related furnishings and amenities would require review by the local transit agency.

For projects where bridges and other structures plans are involved, preliminary and final plan submittals (usually along with bridge plans) should be handled according to the instructions for structures plans submittals covered in **FDM 121** and **FDM 262**.

For projects where retaining walls are required along with roadway plans (no bridge in the project), follow the procedure outlined in **FDM 262**. The submittal of detailed control plans should occur as early in the design process as possible.

### **120.4 Plans Phase Reviews**

The number of submittals and phase reviews is determined on a project-by-project basis and defined in the scope. Submittals allow functional areas to review the development of the project as contained in the scope.

Formal plans phase review requirements are covered in the District Quality Control Plan. Reviews should include Department personnel that can assist in making timely decisions and confirm that the requirements have been met for their discipline. Reviews are driven by the engineering process and occur when input or a decision is needed. Some of these activities are discussed in **FDM 120.2**. Reviews are complete when the comments from

all the various offices have been resolved and have been documented as required in **FDM 125**.

Constructability and biddability reviews by the District Construction Office will be included at appropriate stages of the phase review process. Procedures for these reviews are provided in the [Construction Project Administration Manual](#).

Minor projects, such as resurfacing, typically have two plans phase reviews. The two reviews consist of a decision-making phase review on the scope and intent of the project and a final plans phase review for constructability and biddability. One of these will be an on-site review.

On complex projects plans phase reviews may be required at the Phase I, II and III stages and a final check at Phase IV. Two on-site reviews are typically required with one of these held early in the initial engineering phase.

**FDM 301.3** outlines, in detail, the sequence for contract plans preparation and assembly required by the several design phase submittals. Also included in the chapter is information required to be presented on various plan sheets included with each submittal.

When the plans are in compliance with all phase review requirements and are considered final, they are to be submitted in accordance with the process described in **FDM 131**.

Modification for Non-Conventional Projects:

Delete **FDM 120.4** above and replace with the following:

#### **120.4 Plans Phase Reviews**

**FDM 301** outlines, in detail, the sequence for contract plans preparation and assembly required by the design phase submittals.

## 121 Bridge Project Development

### 121.1 General

Structural designs for new construction are developed under the direction of the Structures Design Office (SDO) and the District Structures Design Offices (DSDO).

Modification for Non-Conventional Projects:

Delete the above paragraph.

Designs are to be developed in accordance with:

- This manual,
- The [Structures Manual](#) (*Topic No. 625-020-018*) (which includes the Structures Design Guidelines, the Structures Detailing Manual),
- The [Standard Plans](#) (*Topic No. 625-010-003*),
- The *AASHTO-LRFD Bridge Design Specifications* as referenced in the [Structures Manual](#),
- Applicable FHWA Directives, and

Other criteria as specified by the Department

Structural designs for repair or rehabilitation of bridges are generally developed under the direction of the District Structures Maintenance Engineer (DSME) and may not include all the submittal types discussed in this chapter.

Modification for Non-Conventional Projects:

Delete the above paragraph.

Structure designs for other agencies or authorities such as the Jacksonville Transportation Authority or various Expressway Authorities may meet the Department's criteria or additional criteria as specified by the authority.

For projects involving bridges over navigable water, notify the DSME a minimum of 90 days prior to engaging in any action in, on, or around the bridge. Refer to **FDM 110.5.3** for further information.

## **121.2 Organization**

The Structures Design Office (SDO) is a subdivision of the Office of Design under the direction of the Chief Engineer and the Assistant Secretary for Engineering and Operations. The SDO is under the direction of the State Structures Design Engineer (SSDE). Each District, including the Turnpike, has a staff of structural design engineers that comprise the District Structures Design Office (DSDO), and which is under the direction of the District Structures Design Engineer (DSDE).

## **121.3 Definitions**

All structures are grouped into the following two categories based upon design difficulty, structural complexity, type of construction materials used and history of use in Florida.

### **121.3.1 Category 1 Structures**

The following structure types are classified as Category 1 Structures:

- (1) Box or three-sided culverts
- (2) Bridges with simple or continuous span reinforced concrete slab superstructures
- (3) Bridges with prestressed concrete slab superstructures
- (4) Bridges with simple span non-posttensioned concrete beam or concrete girder superstructures with cast in place decks
- (5) Widening for the structure types listed above
- (6) Steel truss pedestrian bridges utilizing proprietary designs
- (7) Retaining walls
- (8) Roadway signing, signalization and lighting supports
- (9) Overhead sign structures and toll gantries
- (10) Noise walls and perimeter walls

### **121.3.2 Category 2 Structures**

All structure types not listed above are classified as Category 2 Structures unless exempted by the SDO. In addition to, or in lieu of, the criteria listed above, a structure is classified as a Category 2 Structure when any of the following are present:

- (1) Bridge substructures containing post-tensioned components, straddle piers and integral caps

- (2) Bridges designed for vessel collision, coastal bridges that are vulnerable to coastal storms, and bridge water crossings where scour has to be accounted for in the design.
- (3) Bridges with non-redundant foundations or bridges with micropile foundations.
- (4) Any component designed using Fiber Reinforced Polymer (FRP) composite materials
- (5) Braided underpass structures where the beams or flat slab superstructure element is not oriented parallel to traffic of the overlying roadway and a portion of the superstructure and substructure extends beyond the limits of the overlying traffic barriers
- (6) Design concepts, components, elements, details or construction techniques not normally used by Florida DOT including but not limited to:
  - (a) New bridge types
  - (b) New materials used to construct bridge components
  - (c) New bridge construction methods
  - (d) Non-standard or unusual bridge component-to-component configurations and connection details
  - (e) Department issued [Developmental Standard Plans](#) or modified versions of Developmental Design Standards
  - (f) Items not covered by the Department's [Standard Specifications](#)
  - (g) All atypical precast structural elements (The following are not considered to be atypical: Segmental Box Girder Superstructure Components, Spliced I and U-Girders, AASHTO Beams, and precast elements included in the [Standard Plans](#).)
  - (h) Prefabricated Bridge Elements and Systems (PBES) not meeting all requirements of Chapter 25 of the [Structures Detailing Manual](#).

The Department supports the use of accelerated project construction techniques including the expanded use of precast/prefabricated bridge elements and systems as a way to reduce costs, construction time, and user impacts; however, the use of precast/prefabricated bridge elements can create long term durability and quality issues depending on the details utilized. Therefore, the designs and details for these elements must be approved by the Department prior to use.

Modification for Non-Conventional Projects:

Items listed in numbers 4 through 6 above are not allowed unless they are specifically permitted in the RFP or unless they are submitted and approved during the Alternative Technical Concept (ATC) process.

## 121.4 Abbreviations and Acronyms Used in Structures Design

Terminology used in the area of Structures Design is often written in the form of abbreviations or acronyms. Following is a list of acronyms frequently encountered in this manual and in other references used in structures design and include those commonly used for offices, organizations, materials, systems, features, equipment, conditions, and expertise:

<b>AASHTO</b>	<b><i>American Association of State Highway and Transportation Officials</i></b>
<b>ACI</b>	<b><i>American Concrete Institute</i></b>
<b>ACIA</b>	<b><i>Assigned Commercial Inspection Agency</i></b>
<b>ADA</b>	<b><i>Americans with Disabilities Act</i></b>
<b>AISC</b>	<b><i>American Institute of Steel Construction</i></b>
<b>ANSI</b>	<b><i>American National Standards Institute</i></b>
<b>APL</b>	<b><i>Approved Products List</i></b>
<b>AREMA</b>	<b><i>American Railway Engineering and Maintenance Association</i></b>
<b>ASTM</b>	<b><i>American Society for Testing and Materials</i></b>
<b>AWS</b>	<b><i>American Welding Society</i></b>
<b>BBS</b>	<b><i>Bulletin Board System</i></b>
<b>BDR</b>	<b><i>Bridge Development Report</i></b>
<b>BHR</b>	<b><i>Bridge Hydraulics Report</i></b>
<b>BHRS</b>	<b><i>Bridge Hydraulics Recommendation Sheet</i></b>
<b>CADD</b>	<b><i>Computer Aided Design and Drafting</i></b>
<b>CEI</b>	<b><i>Construction Engineering and Inspection</i></b>
<b>C.I.P. (C-I-P)</b>	<b><i>Cast-in-Place (Concrete)</i></b>
<b>CSIP</b>	<b><i>Cost Savings Initiative Proposal</i></b>
<b>CPAM</b>	<b><i>Construction Project Administration Manual</i></b>
<b>CVN</b>	<b><i>Charpy V-Notch (Impact Testing)</i></b>
<b>DSDE</b>	<b><i>District Structures Design Engineer</i></b>
<b>DSDO</b>	<b><i>District Structures Design Office</i></b>
<b>DSME</b>	<b><i>District Structures Maintenance Engineer</i></b>
<b>EOR</b>	<b><i>Engineer of Record</i></b>
<b>FDOT</b>	<b><i>Florida Department of Transportation</i></b>
<b>FHWA</b>	<b><i>Federal Highway Administration</i></b>
<b>GRS</b>	<b><i>Geosynthetic Reinforced Soil</i></b>
<b>LRS</b>	<b><i>Low-relaxation Strands</i></b>
<b>LRFD</b>	<b><i>Load and Resistance Factor Design</i></b>
<b>MHW</b>	<b><i>Mean High Water</i></b>
<b>MSE</b>	<b><i>Mechanically Stabilized Earth (Walls)</i></b>
<b>MUTCD</b>	<b><i>Manual on Uniform Traffic Control Devices</i></b>
<b>NBR</b>	<b><i>Nominal Bearing Resistance</i></b>
<b>NHS</b>	<b><i>National Highway System</i></b>
<b>NHW</b>	<b><i>Normal High Water</i></b>



<b>NOAA</b>	<b>National Oceanic and Atmospheric Administration</b>
<b>OEM</b>	<b>Office of Environmental Management</b>
<b>OIS</b>	<b>Office of Information Systems</b>
<b>OSHA</b>	<b>Occupational Safety and Health Administration</b>
<b>PDA</b>	<b>Pile Driving Analyzer</b>
<b>PD&amp;E</b>	<b>Project Development and Environment</b>
<b>PPD</b>	<b>Plans Production Date</b>
<b>RDR</b>	<b>Required Driving Resistance</b>
<b>RFP</b>	<b>Request For Proposal</b>
<b>SDO</b>	<b>Structures Design Office</b>
<b>SIP (S-I-P)</b>	<b>Stay-in-Place (Forms)</b>
<b>SRS</b>	<b>Stress-relieved Strands</b>
<b>SSDE</b>	<b>State Structures Design Engineer</b>
<b>TAG</b>	<b>Technical Advisory Group (SDO and DSDEs)</b>
<b>TFE (PTFE)</b>	<b>Polytetrafluoroethylene (Teflon)</b>
<b>TRB</b>	<b>Transportation Research Board</b>
<b>TTCP</b>	<b>Temporary Traffic Control Plans</b>
<b>UBC</b>	<b>Ultimate Bearing Capacity</b>
<b>UV</b>	<b>Ultraviolet</b>

## 121.5 Responsibility

The District Structures Design Office has total project development and review responsibility for projects involving Category 1 Structures. The Structures Design Office has total project development and review responsibility for projects involving Category 2 Structures. This responsibility for Category 2 Structures extends to widening and rehabilitation projects and repairs of bridge components that qualify the structure as a Category 2 Structure. For large projects with multiple bridges, review responsibilities will be coordinated between the District Structures Design Office and the Structures Design Office based on the category of the individual bridge, work load demands and project make-up. Where the majority of the structures on a large multi-bridge project are Category 2, the Structures Design Office will have total project development and review responsibility for the entire project; where the majority of the structures are Category 1, the Structures Design Office will have project development and review responsibility for the Category 2 bridges only, and the District Structures Design Office will have project development and review responsibility for the Category 1 bridges.

The District Project Manager must coordinate with the District Structures Design Engineer who will review and concur with the bridge aspect of all projects during the PD&E process in accordance with **Part 2, Chapter 3** of the [PD&E Manual](#).

The District Structures Design Engineer or the State Structures Design Engineer, as appropriate, must concur/approve all bridge related work after location design approval is granted.

To assure a uniform approach to a project, the Engineer of Record must coordinate with the appropriate Structures Design Office to discuss structures related phase review comments and get concurrence on how to proceed.

Modification for Non-Conventional Projects:

Delete **FDM 121.5** and replace with the following:

### **121.5 Responsibility**

Submit RFP's on those projects where it is anticipated that Category 2 bridges will be designed and constructed to the State Structures Design Engineer for review and approval. Submit RFP's on those projects where it is anticipated that Category 1 bridges will be designed and constructed to the District Structures Design Engineer for review and approval.

The District Structures Design Office has total component structure plan review responsibility for projects involving Category 1 Structures. The Structures Design Office has total component structure plan review responsibility for projects involving Category 2 Structures. This responsibility for Category 2 Structures extends to widening and rehabilitation projects and repairs of bridge components that qualify the structure as a Category 2 Structure. The District Structures Design Engineer or the State Structures Design Engineer, as appropriate, determine when structure component plans should be "Released for Construction."

The District Project Manager must coordinate with the District Structures Design Engineer who will review and concur with the bridge aspect of all projects during the PD&E process in accordance with **Part 2, Chapter 3** of the [PD&E Manual](#).

### **121.6 Projects of Division Interest**

See **FDM 125** for FHWA requirements.

### **121.7 Bridge Project Development**

The following sections will define, clarify and list the information necessary to produce an acceptable and reproducible set of contract documents (special provisions, bridge contract drawings) ready for advertisement and construction.

Bridge project development normally includes five phases of development. The first phase of development, bridge analysis, occurs during the Project Development and Environment (PD&E) process. After location design approval is granted, the second

phase, Bridge Development Report/30% Structures Plans, is initiated. After approval of the BDR, the final phases of work will begin. The third phase is the 60% Structures Plans that consists of the substructure foundation submittal for all projects and 60% Structures Plans for most Category 2 Structures. The fourth phase includes the 90% Structures Plans and specifications. The fifth phase includes the 100% Structures Plans and specifications. For efficiency, one engineering firm (one design team) should be responsible for the BDR and the final plans and specifications.

For Category 2 bridges and some Category 1 bridges, step negotiations are suggested. Step negotiations are desirable because the final bridge type cannot be determined until the BDR is complete. Utilizing this scenario, the first step of the negotiations would include the BDR/30% Structures Plans. After submittal of the BDR/30% Structures Plans, negotiations for final three phases of work (60% Structures Plans, 90% Structures Plans and 100% Structures Plans) would begin. Negotiations should not be finalized until the BDR/30% Structures Plans are approved by the DSDO or the SDO as appropriate.

Modification for Non-Conventional Projects:

Delete **FDM 121.7** and replace with the following:

### **121.7 Bridge Project Development**

Bridge project development normally includes four phases of development. The first phase of development, bridge analysis, occurs during the Project Development and Environment (PD&E) process. The second phase includes the development of the bridge related project constraints based on project specific requirements and development of the bridge concept plans for inclusion into the RFP. A series of pre-scoping questions has been compiled and are available on the Office of Construction website to aid in the development of project specific constraints. Depending on the complexity of the project and at the discretion of the Department,

this second phase may include a Bridge Feasibility Assessment for the purpose of developing the structures concept plans. The third phase involves the project procurement process. See [Procurement and Administration Procedure \(Topic No. 625-020-010\)](#) for specific requirements. The fourth phase includes component structure plan reviews in accordance with the requirements of the RFP.

## 121.8 Bridge Analysis

### 121.8.1 General

The Bridge Analysis is performed during the PD&E phase by qualified bridge engineers. The District Structures Design Engineer must concur with the findings of the bridge analysis, which is part of the preliminary engineering report. The function of the bridge analysis is to determine the general attributes for the recommended bridge. The specific attributes of the bridge will be defined in the BDR.

For bridges over water, a location Hydraulics Report will be prepared in conjunction with the bridge analysis. General site geotechnical knowledge is also required (usually from existing bridge plans) or, in some cases, it may be desirable to obtain borings.

### 121.8.2 Contents

The bridge analysis provides conceptual guidance for the bridge design consultant. Conceptual guidance on how the bridge should fit into the uniqueness of the site should be provided. Bridge design and structure type should be left to the design team in the later phases of work. Include the following in the bridge analysis:

- (1) Environmental and site considerations, including the need for wildlife connectivity (see **FDM 110.5.4**).
- (2) Vertical and horizontal clearances (existing and proposed).
- (3) Disposition of existing structure. (Final disposition of demolished bridge debris will depend on whether or not a local, State or Federal agency has agreed to receive the debris. See **FDM 110.5.2.3**).
- (4) Vertical and horizontal geometry.
- (5) Typical section.
- (6) Conceptual ship/barge impact data (sample of recreational and commercial traffic).
- (7) Identification of historical significance of bridge and surrounding structures.
- (8) Aesthetic level for bridge and bridge approaches.
- (9) Location Hydraulics Report.
- (10) Bridge deck drainage considerations.
- (11) Stream bottom profile.
- (12) Conceptual geotechnical data.
- (13) For sites with movable bridge options, a life cycle cost comparison will be prepared and compared to fixed bridge options (Ref: **AASHTO Movable Bridge Inspection, Evaluation, and Maintenance Manual, 2<sup>nd</sup> Edition**).
- (14) Phase Construction Impacts.

(15) Construction time.

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

The BDR is intended to establish all the basic parameters that will affect the work done in the Design and Plans Preparation phase. Initiate the BDR after location design approval (For those sites not requiring location design approval, a categorical exclusion will be required before initiation of the BDR). Once approved, the BDR will define the continuing work by the Engineer of Record (EOR). It is mandatory that the EOR obtain and coordinate the information and requirements of the offices and engineering disciplines whose input is essential to the preparation of an effective BDR. Changes to the parameters after the BDR is approved could result in schedule delays and supplemental agreements; therefore, it is critical that District Offices, FHWA (if involved), the Structures Design Office and other involved agencies recognize the purpose and importance of the BDR. The BDR phase of work will contain sufficient detail for the justification of the proposed bridge type. For most projects, the 30% Structures Plans will be included as an appendix to the BDR. The BDR is developed from information outlined on the Bridge Development Report Submittal Checklist shown in **Form 121-A** (see **FDM 103**). This information is often provided by others; however, the EOR is responsible for ensuring that all of the information is adequate and appropriate. If the data is not sufficient, the EOR must obtain the required information before the BDR can be completed and submitted.

When alternate designs are considered, consistency between the alternates is essential in ensuring equitable competition and optimum cost-effectiveness. This consistency includes uniformity of design criteria, material requirements and development of unit costs.

The BDR should contain only supportable and defensible statements. Subjective opinions or unsubstantiated statements are not acceptable. All arguments are to be clearly and logically defensible with calculations, sketches or other technical data.

The quantity of work necessary to prepare the BDR depends upon the project's complexity; however, the usual work effort for bridge types normally encountered is:

- (1) Minor Bridge Widening: The BDR will be a minor work effort; however, viable structural possibilities and economical options should be thoroughly investigated to determine if replacement of the bridge would be more appropriate than its widening. This is particularly true at sites where the existing bridge condition is marginal, where there has been a record of serious flooding or scouring, when the widening is part of a route improvement with a high potential for attracting traffic, if the existing bridge has a history of structural problems (including vessel collision), or if the inventory rating is less than required by AASHTO and cannot be improved. Load rating considerations that are to be included in the BDR recommendations are provided in **Section 7.1.1** of the [Structures Design Guidelines](#).

- (2) Minor Grade Separations or Small Water Crossings: The BDR will be a thorough document that adequately addresses all viable structure types; however, the BDR will not usually be an extensive document since the viable types of superstructure and substructure are generally limited. The report is to consider scour, vessel collision, and wildlife connectivity.
- (3) Major Bridges (including Movable) and Major Interchanges: The BDR will be an extensive and comprehensive document that thoroughly considers all viable structure types and considers all design parameters (such as scour, vessel collision and wildlife connectivity).

### 121.9.1 Contents

The major items to be considered in the BDR are:

- (1) General: The bridge length, height and pier locations are subject to vertical and horizontal design clearance requirements such as those for clear zone, navigation, wildlife connectivity, and hydrology. After these considerations are met, span lengths are governed by economics and aesthetic considerations. Superstructure depths (grade separation structures in particular) are to be kept to the minimum that is consistent with good engineering practice. Recommended span/depth ratios for steel superstructures are shown in AASHTO.

The length of the bridge will be affected by:

- (a) Opening required by the Bridge Hydraulic Report.
  - (b) Environmental Considerations, including wildlife connectivity (see **FDM 110.5.4**).
  - (c) Railroad clearances and cross sections.
  - (d) Width of waterway or width of cross section of roadway being spanned including the use of retaining walls, or fender systems.
- (2) Statical System: Address the economic and engineering advantages of both simple span and continuous spans.
  - (3) Superstructure: Some superstructure types that could be considered are prestressed concrete girders, inverted-tee sections, reinforced or prestressed concrete slabs, steel rolled sections or plate girders, steel or concrete box girders, and post tensioned slabs, bulb-tees or boxes.
  - (4) Substructures: Some substructure types that could be considered are pile bents and multi-column or hammerhead piers. Variations of column shapes may be appropriate for aesthetic or economical requirements.
  - (5) Foundations: Some foundation types that could be considered are steel and concrete piles, drilled shafts, geosynthetic reinforced soil (GRS) abutments and spread footings. Assess GRS abutments to determine feasibility for all new bridges.

- (6) Vessel Collision: Vessel collision forces will often have a major effect on the structural configuration and overall economics. See vessel collision requirements in the [Structures Design Guidelines](#).
- (7) Scour: The 100 year and 500 year predicted scour elevations will often have a major effect on the foundation design. See the foundations and geotechnical requirements in the [Structures Design Guidelines](#).
- (8) Temporary Traffic Control: Show how traffic will be maintained during construction for each of the bridge alternates considered. Assess the impacts of the traffic carried on the structures as well as under the structures being constructed. Consider all major overhead work items such as bridge demolition and girder placement. Show stability towers locations, phased construction sequences, girder splice locations, for each alternate being considered. Compare traffic user impacts for each of the alternates.

(See **FDM 240.4** for additional requirements)

- (9) Precast Bridge Options: Investigate the use of either partial or full precast bridge alternate(s) with the specific purpose of accelerating bridge construction and reducing user impacts. As part of this investigation:
  - (a) Conduct a feasibility assessment responding to questions similar to those listed in **FDM 121.19**.
  - (b) Based on responses to the feasibility questions, explain whether a precast alternate should be considered an advantage on the project or what site constraints, economic impacts, or other factors (e.g., haul distance from precast yard, project variability) precluded or limited its application. If precasting is determined not to be applicable for the project, provide a statement in the BDR indicating so and the reasons why. This statement fulfills the requirements of this section.
  - (c) Only if precasting is found to be viable, evaluate preliminary precast alternates and associated MOT schemes against conventional methods using the assessment matrix and referenced links given in **FDM 121.19**. Provide enough detail in the preliminary evaluation in order to estimate total direct and indirect costs. Indirect costs, typically referred to as road user costs, include fuel use and man-hour losses resulting from detours, anticipated traffic flow reduction, and reduced speed limits. Determine indirect costs using the Department's software at the following link:

<http://infonet.dot.state.fl.us/tlconstruction/SchedulingEng/AddSoftwareScheduling.htm>

At this stage, a meeting with the District Structures Design Engineer is recommended to discuss the preliminary evaluation and cost estimates before finalizing the alternates for inclusion in the BDR.

- (d) See **Chapter 25** of the [Structures Detailing Manual](#) for design considerations as it relates to Prefabricated Bridge Elements and Systems (PBES).
- (e) Report the estimated total direct costs and estimated total indirect costs, as well as the sum of both, for *each* alternate as three separate dollar amounts in a summary table in the same section as the completed assessment matrix (see **Table 121.19.2**).

The Structures Design office has developed several training videos for the purpose of educating designers on factors for consideration related to use of Prefabricated Bridge Elements and Systems (PBES) for Accelerated Bridge Construction (ABC). The main emphasis of the training videos is to demonstrate the sort of factors and project constraints that influence whether bridge components should be used. Also discussed are overall prefabricated ABC strategies and implications, including examples showing how labor, material, and equipment costs are considered.

These training videos have been posted on a website along with notification of upcoming developments and helpful links to related external websites. The Department's Structures Design Office website for Every Day Counts can be viewed at: <http://www.fdot.gov/structures/edc/>.

Providing both the direct and indirect costs of the project in the BDR enables Department management to make informed decisions to maximize construction dollars while at the same time minimizing construction time and economic impacts to Florida's traveling public.

Also, demonstrate in the BDR text that consideration was given to identify and employ other innovative techniques aimed at reducing costs, shortening project delivery time, enhancing safety during construction, and protecting the environment.

- (10) Quantity estimates: For minor bridges rough quantities (such as reinforcing steel based on weight per volume of concrete) may be sufficient. For major and complex bridges the degree of accuracy may require more exact calculations keeping in mind that the intent is to establish relative and equitable costs between alternates and not necessarily to require the accuracy of the Final Estimate. For major and complex structures it may be necessary to develop unit costs from an analysis of fabrication, storage, delivery and erection costs of the different components. Provide calculated debris volume quantities for projects involving the demolition of bridges.
- (11) Unit costs: Data available from the Department or contractors and suppliers should be used to arrive at unit costs. Record the sources of all price data for later reference. Base cost should be obtained from the **BDR Estimating Section** of the [Structures Manual](#).
- (12) Develop cost curves: For each alternative establish the most economical span arrangement, i.e., minimum combined superstructure and substructure cost.



- (13) Retaining Wall Study: If retaining walls are present, include a retaining wall study in the BDR. This study will conform to the work as specified in **FDM 262** and the [\*\*Structures Manual\*\*](#).
- (14) Movable Bridges: Include information in the BDR on the type of equipment for the machinery and electrical drive systems, together with a general description of the control system to be utilized. Include a written description and preliminary layouts of system components. Utilize acronyms and terminology as defined in **AASHTO Movable Bridge Inspection, Evaluation, and Maintenance Manual, 2nd Edition**.
- (15) Bicycle and Pedestrian Facilities: Describe in the BDR the facilities to be provided and the means to be used to comply with ADA requirements and **FDM 222, 223, and 224**.

For rehabilitation project plans, include the BDR stage in the plans and written descriptions of those system components to be modified from the existing configuration, along with plans of the existing configuration. Submittal of information described in the previous paragraph is not required unless the electrical and mechanical configuration is modified from the existing configuration.

### **121.9.2 Format**

The report is to use standard, letter-size pages with any larger sheets or drawings folded to fit the report size. The report is to be neatly written and the contents presented in a logical sequence with narrative, as required, to explain the section contents. Provide an Executive Summary to compare the relative features and costs of the alternates considered and recommend alternate(s) to be carried forward into the Final Structures Plans Preparation phase.

The BDR is to be as self-contained as possible by including all arguments that establish, justify, support, or prove the conclusions. It is acceptable to make reference to other documents that will be included in the final submittal package; however, include any documentation that will help emphasize a point, support a statement, or clarify a conclusion. Such documentation may include drawings, clear and concise views, or other such illustrated information.

Address construction time requirements in the BDR and the effect that components, systems, site constraints and conditions, or other site characteristics or criteria have upon the construction time, whether additive or deductive.

For most projects, the 30% Plans must be an appendix to the BDR.

### **121.9.3 Aesthetics**

- (1) General: Integrate three basic elements in any bridge design: efficiency, economy and elegance. Regardless of size and location, the quality of the structure, its

aesthetic attributes and the resulting impact on its surroundings is to be carefully considered. Achieving the desired results involves:

- (a) Full integration of the three basic elements listed previously.
- (b) The EOR's willingness to accept the challenge and opportunity presented. A successful bridge design will then be elegant or aesthetically pleasing in and of itself and will be compatible with the site by proper attention to form, shapes and proportions. Attention to details is of primary importance in achieving a continuity of line and form. Use the rule of "form following function."

Consider the totality of the structure as well as its individual components and the environment of its surroundings. A disregard for continuity or lack of attention to detail can negate the best intent. Formulas cannot be established; however, ACI's ***Aesthetic Considerations for Concrete Bridges*** and TRB's ***Bridge Aesthetics Around the World***, as well as authors such as David P. Billington can guide the designer. A book developed by the Maryland Department of Transportation entitled ***Aesthetic Bridges*** provides excellent guidance. In bridge aesthetics the designer is dealing with the basic structure itself; not with enhancement, additions or other superficial touches. The EOR is expected to be well read on the subject of bridge aesthetics and committed to fulfilling both the structural and aesthetic needs of the site.

The challenge differs for major and minor structures. Indeed, the challenge may be greater the smaller the project. Major structures, because of their longer spans, taller piers, or curving geometry often offer inherent opportunities not available for minor bridges.

Some basic guidelines where aesthetics may play a more important role are:

- (a) Bridges highly visible to large numbers of users (maritime and motorists).
- (b) Bridges located in or adjacent to parks, recreational areas, or other major public gathering points.
- (c) Pedestrian bridges.
- (d) Bridges in urban areas in or adjacent to commercial and residential areas.
- (e) Multi-bridge projects, such as interchanges, or corridors should attain conformity of theme and unifying appearance. Avoid abrupt changes in structural features.

Considering these guidelines, the District will determine the level of aesthetic effort warranted on a project early in its development. When significant aesthetic expense is proposed, such as is the case with Level Three (Level of Aesthetics), Federally funded projects require legitimate written justification.

(2) Levels of Aesthetics:

Normally the District will establish one of the following three general levels of aesthetic consideration and effort at each structure's site:

- (a) **Level One:** Consists of cosmetic improvements to conventional Department bridge types, such as the use of color pigments in the concrete, texturing the surfaces, modifications to fascia walls, beams, and surfaces, or more pleasing shapes for columns and caps.
- (b) **Level Two:** The emphasis is on full integration of efficiency, economy and elegance in all bridge components and the structure as a whole. Consideration should be given to structural systems that are inherently more pleasing, such as hammerhead or "T" shaped piers, oval or polygonal shaped columns, integral caps, piers in lieu of bents, smooth transitions at superstructure depth change locations, box-type superstructures, concealed drain pipes, conduits and utilities.
- (c) **Level Three:** The emphasis in this level applies more to the overall aesthetics when passing through or under an interchange or at other sites such as historic or highly urbanized areas where landscaping or unique neighborhood features are to be considered. The bridge itself must comply with Level Two requirements. This level of work may require, at the District's option, a sub-consultant (architect to consider adjacent building styles, and landscape themes) with the necessary expertise and credentials to perform the desired work.

These aesthetic levels are not exclusive. For example, where the EOR believes a specific landscape feature might significantly enhance bridge site elegance, even on a Level 1 design, the recommendation should be offered for the Department's consideration. For aesthetic Levels 2 and 3, public input into this issue may be appropriate. The EOR may recommend particular public involvement to the Department for consideration or the district might specify such efforts at specific times during the BDR and final plan development phase of the project.

Include a summary of aesthetic considerations for the structure and the site in the BDR. The summary consists of sketches or drawings of recommended treatment as well as the options considered in the aesthetic study but not recommended as appropriate. Also include an estimate of cost to implement the recommended aesthetic treatment in the summary.

The default condition for new steel bridges is uncoated weathering steel where site conditions permit (See **SDG 1.3.2**). Use an Inorganic Zinc Coating System where site conditions preclude uncoated weathering steel and may be used elsewhere with approval of the Chief Engineer. Use of a High Performance Coating System to any extent for Steel bridges requires written approval from the Chief Engineer.

## **121.9.4 Construction and Maintenance Considerations**

Evaluate all viable structure concepts for constructability. Consider items such as member sizes, handling, fabricating, and transporting members as well as maintenance of traffic, construction staging, equipment access, equipment requirements. Perform a special evaluation to insure against potential problems that may occur in obtaining permits and equipment to transport long and heavy members from point of manufacture to the project site. Contact the Department's Road Use Permits Office for questions concerning the feasibility of transporting long and heavy structural components. Also, take into account considerations for future maintenance inspection in the structure's design. Include those considerations described in **FDM 121.15** and the requirements of the [Structures Manual](#). All special construction and maintenance requirements should be identified and appropriately considered in any concepts recommended for design. A design is properly inspectable when it permits safe inspector access to all portions of the structure using equipment available to District Structures Maintenance personnel.

## **121.9.5 Historical Significance Considerations**

When an older bridge is considered for rehabilitation or replacement, the Environmental Management Office will evaluate the historical significance of the structure. A structure may be historically significant due to some of the following characteristics:

- (1) The structure may be an historic example in the development of engineering.
- (2) The crossing may be historically significant.
- (3) The bridge may be associated with an historical property or area.
- (4) The bridge might be associated with significant events or circumstances.
- (5) National Register of Historic Places or on a state or local historical register. If it is determined that the structure is historically significant, then the project should be developed to preserve the historic character of the structure.

## **121.9.6 Bridge Security**

Perform a refined evaluation of all new Category 2 bridges identified in a PD&E study as critical, landmark or signature bridges to determine if anti-terrorist countermeasures are to be included as part of the design. Contact the State Structures Design Office and the State Maintenance Office for guidance and assistance. Minimize the bridge vulnerability through alternative designs developed in the BDR. Design countermeasures to minimize the effectiveness of explosives. Minimize vulnerability to shape charges and vehicle bombs. Maximize the use of structural redundancy and continuity to limit structural damage.

Countermeasures designed into the bridge alternatives must meet one or more of the following objectives:

- (1) Protect structure from blast effects;
- (2) Maximizing explosive standoff distance;
- (3) Denial of access;
- (4) Minimizing time-on-target;
- (5) Selective protection of the structural integrity of key members;
- (6) Structural redundancy.

Use one or more of the following countermeasure strategies in the design:

- (1) Deter attacks by the possibility of exposure, capture or failure of the attacker due to visible countermeasures;
- (2) Detect potential attacks before they occur and provide the appropriate response force;
- (3) Defend the bridge by delaying and distancing the attacker from the bridge and protecting the bridge from the effects of weapons, fire and vehicle and vessel impacts;
- (4) Design the bridge to minimize the potential effects of Weapons of Mass Destruction (WMDs) and conventional explosives, fire and vehicle and vessel impacts.

Structural members that are fracture critical or are cable stays, cable stay pylons, hollow boxes, single columns, twin wall columns and thin wall columns require design modification to reduce the potential impact of explosions. Access into cable stay pylons, box superstructures and movable bridge machinery require heavy doors with secure lock systems. Bridges with essential communication utilities and or gas lines require the design to minimize risk to the utility.

## **121.9.7 Alternative Designs**

The use of alternative designs for some larger or complex projects may result in more competitive bids and lower costs. Accordingly, the EOR is to evaluate benefits from alternatives for the particular structure being developed and provide a recommendation for or against preparing alternative designs. Support the alternative designs recommended by the evaluations included in the BDR. As a guide, consider the following in evaluating justification for alternative designs:

- (1) Alternative designs are to be considered for all structures that cost more than \$25 Million and a difference in alternate material (steel versus concrete) construction costs that are within twice the cost of producing the alternate plans. For example, alternative designs would be warranted if the additional preliminary engineering cost for final plans preparation is \$1.5 million per alternate and the difference between the construction cost estimates utilizing the Department estimating practices in the BDR was less than \$3 million.

- (2) For bridges that cost less than \$25 million consider alternative designs when project issues reflect possible advantages (i.e., TTCP, A+B) from competitive bids.
- (3) For bridges estimated to cost more than \$10 million consider evaluation of alternative designs whenever a unique design concept is proposed until such time that a bid history is established for the unique design.
- (4) Projects containing multiple bridges with a reasonable mixture of concrete and steel designs do not require alternate designs.

Steel box structures and steel plate girders should be evaluated including the differences in corrosion potential. Box Girders are preferred over plate girders when located in extremely aggressive environments.

### **121.9.8 Conclusions and Recommendations**

With due consideration for all applicable data, the engineer is required to recommend the final bridge design system for the site. Thorough justification for the selection will be presented which examines each element of data, and the total estimated construction cost of the recommended design must be indicated in the BDR. For most projects, support the recommended design by thirty percent plans (preliminary) as an appendix to the BDR.

The following sections will define, clarify and list the information necessary to produce an acceptable and reproducible set of contract documents (special provisions, bridge contract drawings) ready for advertisement and construction. The production of a bridge project commences with the Bridge Development Report (BDR) and ends with complete Contract Documents.

### **121.9.9 30% Structures Plans**

The 30% Structures Plans should be submitted with the Bridge Development Report for most structures. The consultant's scope of services should clearly state at what point are the 30% plans to be submitted. If the 30% Structures Plans are submitted separately, the BDR is required to contain enough information and drawings to depict the information needed to properly determine the type, size and location of the bridge. Include the Phase 1 Geotechnical Report and the Hydraulic Report with the submittal containing the BDR.

The 30% Structures Plans should show, as a minimum, the following information:

- (1) General Notes Sheet: As many general notes as possible should be included on this sheet at this stage. Add subsequent notes, when necessary, as the design progresses (for example of General Notes, see **Chapter 5** of the [Structures Detailing Manual](#)).
- (2) Plan and Elevation Sheet: provide contents as required by the Structures Detailing Manual.

- (3) Substructures: For end bents, piers or intermediate bents, show substructure elements and sizes including all deviations from the typical dimensions, foundation type including element spacing and the arrangement of piles or drilled shafts.
- (4) Superstructure: Include cross section showing lanes, shoulders, railings, slab thickness, beam type and spacing and web depth for steel girders. If applicable, show geometric changes in shapes of various components. Also show construction phases and maintenance of traffic data, outline of the existing structure and portions to be removed, and utilities (existing and proposed as available).
- (5) Retaining Walls: Submit preliminary control drawings when proprietary or standard cast-in-place walls are proposed. Include control drawings for all critical temporary walls.
- (6) Bridge Hydraulics Recommendation Sheet.
- (7) Report of core borings.
- (8) Proposed construction sequence and methods, indicate construction easements and methods of construction access.
- (9) Preliminary aesthetic details.
- (10) Preliminary post-tensioning layouts.
- (11) Preliminary foundation layouts and installation table.
- (12) Sidewalks: If provided, show preliminary accessible elements.
- (13) Any other special details required by the Engineer or details which are not normally used on Department projects.

In addition to these requirements, the following items will be included for moveable bridges: preliminary electrical and mechanical equipment layouts in plan and elevation, submarine cable routing, and single line electrical diagrams including service voltage. Rough size all equipment and submit the supporting calculations.

Include requests for Design Exceptions and Design Variations for structural design criteria in the 30% Structures Plans Submittal. Design Exceptions and Design Variations are required to be approved in accordance with **FDM 122** with concurrence of the DSDO or SDO as appropriate.

Modification for Non-Conventional Projects:

Delete **FDM 121.9** and replace with the following.

### **121.9 Bridge Feasibility Assessment/Structures Concept Plans**

At the discretion of the Department, a Bridge Feasibility Assessment may be necessary during the RFP development phase for the purpose of developing the structures concept plans. When required, the assessment must target specific critical bridge components to ensure that the preliminary information presented in the concept plans can meet all of the project constraints depicted in the RFP.

For aesthetic and wildlife connectivity requirements, see RFP.

### **121.10 Bridge Development Report (BDR) Submittal Checklist**

The Bridge Development Report (BDR) Submittal Checklist (**Form 121-A**, see **FDM 103**) contains a list of the key supporting elements that are required for the preparation, submittal and review of a BDR. Include this Checklist with the BDR when submitted for review and consists of the following items:

- (1) Typical Sections for Roadway and Bridge:  
The approved typical sections for both the bridge and roadway are required.
- (2) Roadway Plans:  
Preliminary roadway plans covering the bridge vicinity are required.
- (3) Maintenance of Traffic Requirements:  
Show the number of required lanes and the lane widths of all affected roadways in the Maintenance of Traffic Plan.
- (4) Geotechnical Report:  
Prepare the Bridge Geotechnical Report (Phase I) in accordance with Chapter 3 of the [Structures Design Guidelines](#) and the Department's [Soils and Foundation Handbook](#). Document a thorough investigation of all viable foundation types for the bridge and retaining walls. Concurrence of the District Geotechnical Engineer is required for Category 1 Structures and of both the State and District Geotechnical Engineers for Category 2 Structures.
- (5) Bridge Corrosion Environment Report:



Prepare a Bridge Corrosion Report to determine the environmental classifications for the structure in accordance with the [Structures Design Guidelines](#) and receive approval from the District Materials Office.

(6) Existing Bridge Plans:

A set of prints of the existing (preferably as-built) bridge plans should be included for replacement structures and widenings. This is of particular importance for widenings and phase construction. These plans are not usually necessary for completely separate alignments or new interchanges unless the existing structures either will be used for new construction activities or will infringe upon the Contractor's allowed work zone.

(7) Existing Bridge Inspection Report:

A copy of the latest existing Bridge Inspection Report and Structures Inventory and Appraisal Form is required for all widenings and rehabilitations and may be required for new structures. Identify the existing paint system(s) on all significant metal elements of existing structures. Clearly delineate the presence of lead-based paint and asbestos.

(8) Bridge Hydraulics Report and Bridge Hydraulics Recommendation Sheet:

Prepare the Bridge Hydraulics Report (BHR) in accordance with the [Drainage Manual](#). Include the Bridge Hydraulic Recommendations Sheet (BHRS) and address the required hydraulic opening, clearances, scour and deck drainage requirements. In addition to design water elevations normally shown, include the Mean High Water (MHW) elevation for tidal crossings and Normal High Water (NHW) for non-tidal crossings in the BHRS. Concurrence of the BHR by the District Drainage Engineer with the District Structures Design Engineer for Category 1 Structures and State Structures Design Engineer for Category 2 Structures is required.

(9) Wildlife Connectivity:

Describe the decision to include or exclude wildlife connectivity features into the design. The discussion for excluding a wildlife connectivity feature should summarize coordination with the Environmental Management or Permit office (or may be an attached summary memo from one of these offices). The discussion for including wildlife connectivity should refer to the [Wildlife Crossing Guidelines](#), commitments made during PD&E and any other documentation regarding the wildlife connectivity related to the bridge (or may be an attached summary memo from the Environmental Management or Permit office).

(10) Utility Requirements:

Identify proposed utility attachments to the structure as well as all existing and proposed utilities in the vicinity of the structure. Follow the requirements of the Department's [Utility Accommodation Manual](#) regarding attachments to the structure.

(11) Railroad Requirements:

Identify existing and future railroad requirements. This will include all clearances and crash wall or other construction parameters. Include copies of correspondence with the Railroad Agency.

(12) Retaining Wall and Bulkhead Requirement:

Identify permanent and temporary retaining wall requirements, and show the proposed type of wall. Also identify the type, location and extent of temporary walls to accommodate phased construction and maintenance of traffic.

For water crossings where erosion and wave action is anticipated, identify the type, location and extent of bulkhead production. Include the proposed tie-back and anchor system in the submittal.

(13) Lighting Requirements:

Identify proposed lighting on or under the structure.

(14) ADA Access Requirements:

Identify ADA access requirements that affect the structure.

Modification for Non-Conventional Projects:

Delete ***FDM 121.10.***

## 121.11 Final Plans and Specifications Preparation

### 121.11.1 General

Within this phase of work, for both Category 1 and 2 Structures, there are three phases of work; viz., 60% Substructure submittal or 60% Structure Plans, 90% Structure Plans and 100% Structures Plans and Specifications. For projects where preapproved proprietary wall systems cannot be used and fully designed proprietary wall plans are required, submit approved control drawings to the appropriate proprietary wall companies as soon as possible and no later than the 60% substructure submittal. Send a copy of this submission to the DSDO or SDO as appropriate. At any time during the project development, the reviewer may require submittal of design calculations.

After each of the phases, except the 100% Structures Plans Phase, review comments from the Department are sent to the EOR by letter and a marked-up set of prints. The EOR is required to address each of the comments in writing and resolve each comment prior to the next submittal. The Department 100% Structures Plans review comments are to be handled in the same manner; except that unresolved comments may be handled by telephone, in some instances, if confirmed in writing. Also, for any phase, include items and drawings from a preceding phase. Reflect the comments resolved from the previous

phase as well as the accumulated design and drafting effort required of the current phase in the drawings.

### **121.11.2 60% Substructure Submittal / 60% Structures Plans**

This submittal phase is divided into two distinct parts; viz., the 60% Substructure Submittal (required for all projects) and the 60% Structures Plans for Category 2 Structures and some Category 1 Structures.

(1) 60% Substructure Submittal:

This submittal is required for every project and should be made a part of the 60% Structures Plans phase when that phase is part of the project. The submission is only a partial plans set. The purpose of this submittal is to communicate essential project information to the Geotechnical and Hydraulic Engineers so that all remaining calculations can be performed using actual structural shapes, loads, and dimensions. Plan sheets required for this submittal include: Plan & Elevation, Bridge Hydraulics Recommendation Sheet, Boring Logs, Foundation layout, Substructure Plans, and draft technical specifications.

60% Substructure Submittal Contents:

- (a) Foundation Layouts
- (b) Foundation Installation Notes
- (c) Pile/Drilled Shaft Installation Table
- (d) Footing Concrete Outlines (All Variations)
- (e) Pier Concrete Outline (All Variations)
- (f) Wall Plans - Control Drawings
- (g) Pile Details
- (h) Lateral Stability Analysis Completed
- (i) Phase II Geotechnical Report
- (j) Draft Technical Specifications
- (k) Reinforcement of Footing and Column
- (l) Post-Tensioning Details
- (m) Plan and Elevation Sheet
- (n) Bridge Hydraulics Recommendation Sheet
- (o) Boring Logs

(2) 60% Structures Plans:

When a 60% Structures Plans submittal is required, all comments from earlier reviews will have been resolved. At this phase, the design should be 90% complete and the plans, 60% complete. In addition to the documents required for the 60% Substructure Submittal, the 60% Structures include the following details as applicable in the plans: final concrete outlines of all individual components, major reinforcing steel, final post-tensioning layouts, steel box/I-girder details, segmental concrete box details, bearing details, seismic details, details of congested areas, details of unique features, accessible pedestrian facilities details, and other details as required. For moveable bridges the following additional information is required: electrical calculations (for generator size, service voltage drop, short circuit, service size, automatic transfer switch), single line diagram showing equipment sizes and utilities, conduit and wire sizes, panelboard schedules, and light fixture schedules.

### **121.11.3 90% Structures Plans**

Upon approval of the BDR/30% Structures Plans or 60% Structures Plans, as applicable, 90% Structures Plans begin. At this stage of plans development, the EOR will have resolved the 30% and 60% Structures Plans review comments and developed the plans for completion. The design and plan production is required to be 100% complete. This submittal will include prints of the completed plans, Summary of Pay Items (complete with quantities), design calculations, Final Phase II Geotechnical Report, Addendums to Hydraulic Report and, if appropriate, Technical Special Provisions. No sheet or detail should be missing at this stage.

### **121.11.4 100% Structures Plans and Specifications**

After resolution of the 90% Structures Plan comments, the EOR will make all authorized changes necessary to complete the plans and Technical Special Provisions. The EOR will provide a list of all changes made to the Plans or Specifications that were not directly related to the 90% Structures Plans review comments. The intent is to help minimize the Department's review time and to help the Department's review office to focus on only those new items or details proposed by the EOR. This will, in turn, help to expedite the project's authorization.

The 100% Structures Plans submittal is divided into two distinct phases. First, prints of the original drawings and technical special provisions are submitted 30 days prior to the District's Plans Production Date (PPD). Secondly, once notified by the Department, the original drawings and all other documents are submitted to the District.

Within the 30-day period allotted, the EOR will receive notification either of additional changes/corrections to be made or to submit the Final Plans as they are. If at any time during the 30-day period the EOR finds additional changes/corrections that should be made, the Structures Design Office responsible for plans approval (either the District

Structures Design Engineer (DSDE) or the Structures Design Office (SDO) as appropriate) is required to be notified for discussion and resolution.

Once all changes/corrections are made, or if no changes/corrections are necessary, the EOR will submit all work to the District prior to or on the PPD. Submittal of this stage of the work will include the original drawings, one record set of prints with each sheet sealed in accordance with **FDM 130**, quantities book assembled as specified in the Department's [\*\*Basis of Estimates Manual\*\*](#), sealed Technical Special Provisions (if required), and sealed Summary of Pay Items with estimated bridge quantities. If included in the Scope of Services, original documents in electronic format may also be required to be delivered as part of the Electronic Project Submittal.

Modification for Non-Conventional Projects:

Delete **FDM 121.11**. See the RFP for plans submittal requirements.

## 121.12 Independent Peer Review of Category 2 Bridges

Independent Peer Reviews are used to validate the design of Category 2 structures or portions of such. Consideration of when such reviews should be required include but are not limited to the introduction of new complex details or structure types, work being performed that is outside the normal structure type designed by the selected consultant, when the structure contains complex details within standard bridge types (i.e. integral piers, straddle piers, skewed superstructures).

All Cost Savings Initiatives involving a Category 2 Structure require an independent peer review of the Category 2 portions. The Peer Review is required to be performed by a single independent engineering firm other than the engineer responsible for the initial work that is designated by the contractor to conduct the review. The designated independent peer review firm will have no involvement with the project other than conducting the peer review and is required to be pre-qualified in accordance with **Rule 14-75 of the Florida Administrative Code**. For bridges consisting of both Category 1 and Category 2 bridge spans only the Category 2 spans and corresponding substructure components require a peer review. Where the superstructure is Category 1, but the substructure component is Category 2, only the substructure component has to be peer reviewed. For water crossings with vessel impact, the spans or superstructure units with spans over water require a peer review.

### Modification for Non-Conventional Projects:

Delete the above paragraph and replace with the following:

For all Category 2 bridges, an independent peer review is required. The Peer Review will be performed by a single independent engineering firm other than the engineer responsible for the initial work and will be designated by the Contractor or Concessionaire (P3 projects) to conduct the review. The designated independent peer review firm will have no other involvement with the project other than conducting the peer review and is required to be pre-qualified in accordance with **Rule 14-75 of the Florida Administrative Code**. For bridges consisting of both Category 1 and Category 2 bridge spans only the Category 2 spans and corresponding substructure components require a peer review. Where the superstructure is Category 1, but the substructure component is Category 2, only the substructure component has to be peer reviewed. For water crossings with vessel impact, the spans or superstructure units with spans over water require a peer review.

The peer review is intended to be a comprehensive, thorough independent verification of the original work. An independent peer review is not simply a check of the EOR's plans and calculations; it is an independent verification of the design using different programs and independent processes than what was used by the EOR. All independent peer reviews include but are not limited to the independent confirmation of the following when applicable:

- (1) Compatibility of bridge geometry with roadway geometrics including typical sections, horizontal alignment, and vertical alignment. Minimum lateral offsets and vertical clearance requirements.
  - (2) Compatibility of construction phasing with Traffic Control Plans.
  - (3) Conflicts with underground and overhead utilities.
  - (4) Compliance with AASHTO, Department and FHWA design requirements.
  - (5) Conformity to Department Standard Plans.
  - (6) Structural Analysis Methodology, design assumptions, and independent confirmation of design results.\*
  - (7) Design results/recommendations (independent verification of the design).\*
  - (8) Completeness and accuracy of bridge plans.
  - (9) Technical Special Provisions, and Modified Special Provisions where necessary.
  - (10) Constructability assessment limited to looking at fatal flaws in design approach.
- \* When Category 2 superstructure elements are designed with software using refined analyses (e.g. Grid, Finite Element Method), the peer review consultant is required to verify the design results by a different program/method.

In addition to the requirements of **FDM 121.11.3** and **121.11.4**, include the following documents with plan submittals for Category 2 bridges requiring an independent peer review:

- (11) 90% Plan Submittals
  - (a) A tabulated list of all review comments from the independent review engineer and responses from the originator of the design.
  - (b) A standard peer review certification letter following the format presented in **Form 121-B** (see **FDM 103**) signed by the independent review engineer. All outstanding/unresolved comments and issues presented in this letter are required to be resolved and implemented prior to the 100% plan submittal.
- (12) 100% Plan Submittals
  - (a) A certification letter following the format presented in **Form 121-C** (see **FDM 103**) signed and sealed by the independent review engineer stating that all review comments have been adequately addressed and that the design is in compliance with all Department and FHWA requirements.

## 121.13 Plans Assembly

Consult the [Structures Detailing Manual](#) for plans assembly, materials, content of plans, and other drafting information.

## 121.14 Plans Submittal

### 121.14.1 Schedule

The District Project Manager is responsible for establishing the schedule of submittals with input from the EOR and either the District Structures Design Engineer for Category 1 or Structures Design Office for Category 2 projects.

### 121.14.2 Submittal Schedule

- (1) BDR/30% Structures Plans
- (2) 60% Substructure Submittal/60% Structures Plans
- (3) 90% Structures Plans
- (4) 100% Structures Plans

Modification for Non-Conventional Projects:

Delete **FDM 121.14.1** and **121.14.2**. See the RFP for requirements.

### 121.14.3 Summary of Phase Submittals

Submittals made at various stages of project development are required to conform to a uniform standard of completeness for each phase. Use **Table 121.14.1** to prepare deliverables for each stage of project development for fixed bridges. Use **Table 121.14.1** and **Table 121.14.2** to prepare deliverables for each stage of project development for moveable bridges.

**Table 121.14.1** and **Table 121.14.2** give a listing of specific structure plan sheets to be submitted at Bridge Development Report, 30%, 60%, 90% and 100% Plans stage. For specific sheet content requirements, see **Structures Detailing Manual Examples for Design-Bid-Build Projects**. For sheets not covered by specific example, see general description below for required level of completion.

- (1) **Preliminary (P)**: Basic shapes, geometry and layout of specified members are shown. Rebar, elevations, and quantities are not required for Preliminary submittals. For example, the outline drawing of an end bent with complete



dimensions including stationing, beam and pedestal layout but without pile layout dimensions or rebar.

- (2) **Substantially Complete (S):** Shapes, geometry and layout have been finalized. Design is 90% complete with most rebar, plate sizes, bolt patterns, concrete strengths finalized and incorporated into the plans. For example, an end bent drawing with rebar, complete dimensions, pile and beam layout but without elevations or quantities.
- (3) **Complete but Subject to Change (C):** The design, drawings and details are complete for the specified component. Only reviewer-initiated changes should be expected at this level. For example, an end bent drawing would be complete, including all rebar callouts, elevations, dimensions and quantities.
- (4) **Final (F):** All drawings and designs are complete. No changes are expected at this level. Plans are ready to be signed and sealed by the EOR.

Modification for Non-Conventional Projects:

Delete **FDM 121.14.3** and replace with the following.

### **121.14.3 Design-Build Technical Proposal and Component Plan Submittals**

Component Plan Submittals are required to conform to a uniform standard of completeness for each submittal. Use **Table 121.14.3** to prepare deliverables for each component submittals for fixed bridges. Use **Table 121.14.3** and **Table 121.14.4** to prepare deliverables for component submittals for moveable bridges. Unless otherwise shown in the RFP, Technical Proposals are required to include the requirements of **Table 121.14.3** and **Table 121.14.4**.

Submit component submittals per **Table 121.14.3** and **Table 121.14.4** (e.g., foundation, substructure and superstructure) for each bridge. Partial submittals of individual elements within a bridge (e.g., End Bent 1, Pier 3, I-girder details) are not permitted.

**Table 121.14.3** and **Table 121.14.4** give a listing of specific structure plan sheets to be submitted at Technical Proposal, 90% and Final Plans stage. For specific sheet content requirements, see [Structures Detailing Manual Examples for Non-Conventional Projects](#). For sheets not covered by specific example, see general description below for required level of completion.

- (1) **Preliminary (P):** Basic shapes, geometry and layout of specified members are shown. Rebar and elevations are not required for Preliminary submittals. For example, the outline drawing of an end bent with complete dimensions including stationing, beam and pedestal layout but without pile layout dimensions or rebar.
- (2) **Substantially Complete (S):** Shapes, geometry and layout have been finalized. Design is 90% complete with most rebar, plate sizes, bolt patterns, concrete strengths finalized and incorporated into the plans. For example, an end bent drawing with rebar, complete dimensions, pile and beam layout but without elevations.
- (3) **Complete but Subject to Change (C):** The design, drawings and details are complete for the specified component. Only reviewer-initiated changes should be expected at this level. For example, an end bent drawing would be complete, including all rebar callouts, elevations, and dimensions.
- (4) **Final (F):** All drawings and designs are complete. No changes are expected at this level. Plans are ready to be signed and sealed by the EOR.

**Table 121.14.1 Summary of Phase Submittals**

**Provide the sheets listed as applicable based on structure type.**

ITEM	BDR	30%	60% Substr. Submittal	60% Structures Plans*	90%	100%
Cover Sheet		P	S	S	C	F
Key Sheet		P	S	S	C	F
Sheet Index		P	S	S	C	F
General Notes		P	S	S	C	F
Standard Plans Index Sheets					F	F
Summary of Pay Items					C	F
Surface Finish Details			S	S	C	F
Riprap Details			S	S	C	F
Slope Protection Details			S	S	C	F
Plan and Elevation	S	S	C	C	C	F
Typical Section	S	S	C	C	C	F
Hydraulics Recommendation	P	P	S	S	C	F
Construction Sequence	S	S		C	C	F
Borings		C	C	C	C	F
Foundation Layout		S	S	S	C	F
Pile/Shaft Data Table			S	S	C	F
End Bent		P	S	S	C	F
End Bent Details			S	S	C	F
Wing Wall Details			S	S	C	F
Pier	P	P	S	S	C	F
Pier Details		P	S	S	C	F
Footing		P	S	S	C	F
Intermediate Bent	P	P	S	S	C	F
Intermediate Bent Details			S	S	C	F
Drilled Shaft Details		P	S	S	C	F
Finish Grade Elevations				C	C	F
Camber/Build-up/Deflection Diagrams				C	C	F
Framing Plan		P		S	C	F
Superstructure Plan				S	C	F
Superstructure Details				S	C	F
Erection Sequence	P	P	S	S	C	F
P/S Beam Data Tables				S	C	F
Cross Frames/Diaphragm Details				S	C	F
Steel Girder Details		P		S	C	F
P/T Systems		P		S	C	F
Bearing Details				S	C	F
Expansion Joint Details				S	C	F
Approach Slab Details				S	C	F
Reinforcing Bar List					C	F
Conduit and Inspection Lighting Details				P	C	F
Vermin Guard				S	C	F
Wall Control Drawings		P***	S	S	C	F
Wall Details		P	S	S	C	F
Temporary Critical Wall Drawings	P	P	S	S	C	F
Wall Data Tables			S	S	C	F
Temp. Bridge Plan and Elevation			P	P	C	F
Temp. Bridge Foundation Layout			P	P	C	F

**Table 121.14.1 Summary of Phase Submittals (continued)**

Provide the sheets listed as applicable based on structure type.

ITEM	BDR	30%	60% Substr. Submittal	60% Structures Plans*	90%	100%
Segment Joint Coordinates/Deck Elev.				S	C	F
Segment Layout		P		S	C	F
Typical Segment Dimensions	P	P		C	C	F
Typical Segment Reinforcing				S	C	F
Pier Segment Dimensions	P	P		C	C	F
Pier Segment Reinforcing **				S	C	F
Abutment Segment Dimensions	P	P		C	C	F
Abutment Segment Reinforcing **				S	C	F
Expansion Joint Segment Dimensions		P		S	C	F
Expansion Joint Segment Reinforcing **				S	C	F
Deviation Segment Dimensions		P		C	C	F
Deviation Segment Reinforcing **				S	C	F
Post Tensioning Layout		P		C	C	F
P/T Details	P	P		S	C	F
Transverse P/T Details		P		C	C	F
Bulkhead Details		P		S	C	F
Drainage Layout		P		S	C	F
Drainage Details		P		S	C	F
Load Rating Summary Sheet					C	F
Developmental Standard Plans		C	C	C	F	F
Existing Bridge Plans		F ††	F ††	F ††	F	F

**Status Key:**

**P** – Preliminary

**S** – Substantially Complete

**C** – Complete but subject to change

**F** – Final

\* – 60% Structures Plan submittals are required for all Category 2 and some Category 1 bridges. See **FDM 121.11.2** for additional information

\*\* – May require integrated drawings

\*\*\* – Control Plans only showing geometry, stationing, and offsets

‡ – Where required for project

†† – Widening and projects with phased construction

**Table 121.14.2 Summary of Phase Submittals - Movable Bridges**

For approach span requirements, see **Table 121.14.1**.

Provide the sheets listed as applicable based on machinery and electrical components utilized.

ITEM	BDR	30%	60% Structures Plans*	90%	100%
Bascule Pier Notes		P	S	C	F
Bascule Pier Quantities			S	C	F
Bascule Span Elevation	P	S	S	C	F
Leaf Clearance Diagrams		P	S	C	F
Bridge Railing Clearance Diagrams		P	S	C	F
Bascule Pier North Elevation View	P	S	S	C	F
Bascule Pier South Elevation View	P	S	S	C	F
Bascule Pier East Elevation View	P	S	S	C	F
Bascule Pier West Elevation View	P	S	S	C	F
Bascule Pier Deck Plan	P	S	S	C	F
Bascule Pier Deck Elevations	P	S	S	C	F
Bascule Pier Trunnion Level Plan	P	S	S	C	F
Bascule Pier Machinery Level Plan	P	S	S	C	F
Bascule Pier Pit Plan	P	S	S	C	F
Bascule Pier Footing Plan	P	S	S	C	F
Bascule Pier Longitudinal Sections	P	S	S	C	F
Bascule Pier Transverse Sections	P	S	S	C	F
Bascule Pier Railing Details			P	C	F
Bascule Pier Stair Details			P	C	F
Bascule Pier Trunnion Access Platform Details	‡	‡	S	C	F
Bascule Pier Finger Joints			P	C	F
Bascule Pier Deck Level Reinforcing			P	C	F
Bascule Pier Trunnion Level Reinforcing			P	C	F
Bascule Pier Machinery Level Reinforcing			P	C	F
Bascule Pier Pit Reinforcing			P	C	F
Bascule Pier Footing Reinforcing			P	C	F
Bascule Pier North Elevation Reinforcing			P	C	F
Bascule Pier South Elevation Reinforcing			P	C	F
Bascule Pier East Elevation Reinforcing			P	C	F
Bascule Pier West Elevation Reinforcing			P	C	F

**Table 121.14.2 Summary of Phase Submittals - Movable Bridges (Continued)**

Provide the sheets listed as applicable based on machinery and electrical components utilized.

ITEM	BDR	30%	60% Structures Plans*	90%	100%
Bascule Pier Longitudinal Section Reinforcing			P	C	F
Bascule Pier Transverse Section Reinforcing			P	C	F
Bascule Pier Reinforcing Bar List			P	C	F
Control House General Notes			P	C	F
Control house Reflected Ceiling Plan			P	C	F
Control House Access Bridge Dimensions	‡	‡	S	C	F
Control House Access Bridge Reinforcing	‡	‡	S	C	F
Control House Access Bridge Bar List	‡	‡	S	C	F
Control Tower Floor Plans	P	S	S	C	F
Control Tower Sections	P	S	S	C	F
Control Tower Reinforcing Plans			P	C	F
Control Tower Reinforcing Elevations			P	C	F
Control Tower Section Reinforcing			P	C	F
Control Tower Bar List			P	C	F
Control Tower Schedules			P	C	F
Control Tower Elevations	P	S	S	C	F
Control Tower Building Sections			P	C	F
Control Tower Details			P	C	F
Control Tower Stair Plans			P	C	F
Control Tower Stair Sections			P	C	F
Control Tower Roof			P	C	F
Control Tower Door and Window Types and Details			P	C	F
Control Tower Architectural Details			P	C	F
Control Tower HVAC Notes			P	C	F
Control Tower HVAC and Plumbing Floor Plans			P	C	F
Control Tower HVAC and Plumbing Elevations			P	C	F
Bascule Leaf Notes			S	C	F
Bascule Leaf Framing Plan and Longitudinal Section	P	S	S	C	F
Bascule Leaf Transverse Sections at Floorbeams	P	S	S	C	F
Bascule Leaf Transverse Sections at Trunnion	P	S	S	C	F

**Table 121.14.2 Summary of Phase Submittals - Movable Bridges (Continued)**

Provide the sheets listed as applicable based on machinery and electrical components utilized.

ITEM	BDR	30%	60% Structures Plans*	90%	100%
Bascule Leaf Transverse Sections at Counterweight Girders	P	S	S	C	F
Main Girder Elevation	P	S	S	C	F
Main Girder Details			P	C	F
Main Girder Web Geometry and Camber Details			P	C	F
Main Girder Force Diagrams			P	C	F
Main Girder Reaction Influence Lines			P	C	F
Main Girder Moment Influence Lines			P	C	F
Floorbeam Details			P	C	F
Counterweight Girder Details			P	C	F
Stringer Details			P	C	F
Lateral Bracing Details			P	C	F
Counterweight Bracing Plan and Details			P	C	F
Counterweight Bracing Sections and Details			P	C	F
Counterweight Plan			P	C	F
Counterweight Longitudinal Sections			P	C	F
Counterweight Transverse Sections			P	C	F
Counterweight Details and Reinforcing Bar List			P	C	F
Bridge Deck Panel Layout			P	C	F
Bridge Deck Panel Sections			P	C	F
Bridge Deck Panel Details			P	C	F
Armored Joint Details			P	C	F
Span Lock Housing Details			P	C	F
Bascule Leaf Jacking Details and Notes			P	C	F
Mechanical General Notes		P	S	C	F
Mechanical Equipment Schedules		P	S	C	F
Drive Machinery Layout		P	S	C	F
Machinery Support Details			S	C	F
Trunnion Assembly Details		P	S	C	F
Open Gearing Details		P	S	C	F

**Table 121.14.2 Summary of Phase Submittals - Movable Bridges (Continued)**

Provide the sheets listed as applicable based on machinery and electrical components utilized.

ITEM	BDR	30%	60% Structures Plans*	90%	100%
Rack/Rack Frames and Rack Pinion Details		P	S	C	F
Mechanical Bearing Details		P	S	C	F
Drive Hydraulic Cylinders Details		P	S	C	F
Hydraulic System Layout/Piping Details		P	S	C	F
Hydraulic Cylinder Support Assemblies		P	S	C	F
Hydraulic System Details		P	S	C	F
Live Load Shoe Details		P	S	C	F
Centering Device Details			S	C	F
Span Lock Assembly Details		P	S	C	F
Control Tower – Control Console and Operator’s Visualization Geometry Analysis Including CCTV Locations		P	S	C	F
Electrical General Notes		P	S	C	F
Electrical Site Plan		P	S	C	F
Conduit Riser Diagram		P	S	C	F
Single Line Diagram		P	S	C	F
Electrical Symbol Legend		P	S	C	F
Lighting and Equipment Plan (Including Control Tower Lighting, Fire Detection and Lighting Panel Schedules)		P	S	C	F
Lightning Protection, Bonding, and Grounding Plan		P	S	C	F
Navigation Lighting Plan		P	S	C	F
Communication Equipment Plan		P	S	C	F
Control Panel Details		P	S	C	F
Control Console Details		P	S	C	F
Block Diagram of Operating Sequence		P	S	C	F
Control System Architecture Diagram		P	S	C	F
Schematic Diagrams of all Control Systems and Interlocks		P	S	C	F
Control System I/O Points		P	S	C	F
Ladder Logic for PLC			P	C	F
Submarine Cable/Submarine Cable Termination Cabinet Details		P	S	C	F



**Table 121.14.2 Summary of Phase Submittals - Movable Bridges (Continued)**

Provide the sheets listed as applicable based on machinery and electrical components utilized.

ITEM	BDR	30%	60% Structures Plans*	90%	100%
Fire and Security Panel Schematic Diagram		P	C	C	F
CCTV Plan and Elevation		P	C	C	F
Limit Switch Development		P	C	C	F
Conduit and Cable Schedule		P	C	C	F
Electrical Equipment Layout - Including but not limited to Generators, Motors, Control Console, Control Panels, and Motor Control Center.		P	C	C	F
CCTV Layout			P	S	F

**Status Key:**

**P** – Preliminary

**S** – Substantially Complete

**C** – Complete but subject to change

**F** – Final

\* – 60% Structures Plan submittals are required for all movable bridges. See **FDM 121.11.2** for additional information

‡ – Where required for project

**Table 121.14.3 Summary of Design-Build Technical Proposal and Component Plan Submittals**

Provide the sheets listed as applicable based structure type.

**Foundation Submittal**

ITEM	Technical Proposal	90%	Final
Cover Sheet		C	F
Key Sheet		C	F
Sheet Index		C	F
General Notes	S	C	F
Standard Plans Index Sheets		F	F
Surface Finish Details		C	F
Riprap Details		C	F
Slope Protection Details		C	F
Plan and Elevation	P	C	F
Typical Section	P	C	F
Hydraulics Recommendation	P	C	F
Construction Sequence	P	C	F
Borings		C	F
Foundation Layout	P	C	F
Pile/Shaft Data Table		C	F
Drilled Shaft Details		C	F
Temp. Bridge Foundation Layout	P	C	F
Existing Bridge Plans		F##	F
Foundation Related Temporary Critical Wall Drawings	P	C	F
Include in all submittals additional details and backup information necessary to substantiate the loading on the foundations. Include a copy of the Geotechnical Report in all submittals. ## – Widening and projects with phased construction 90% and Final submittals for category 2 bridges require an Independent Peer Review.			

**Substructure Submittal**

ITEM	Technical Proposal	90%	Final
End Bent	P	C	F
End Bent Details		C	F
Wing Wall Details		C	F
Pier	P	C	F
Pier Details		C	F
Footing	P	C	F
Intermediate Bent	P	C	F
Intermediate Bent Details		C	F
Reinforcing Bar List		C	F
90% and Final submittals for category 2 bridges require an Independent Peer Review.			

**Table 121.14.3 Summary of Design-Build Technical Proposal and Component Plan Submittals (Continued)**

Provide the sheets listed as applicable based structure type.

**Superstructure Submittal**

ITEM	Technical Proposal	90%	Final
Finish Grade Elevations		C	F
Camber/Build-up/Deflection Diagrams		C	F
Framing Plan		C	F
Superstructure Plan		C	F
Superstructure Details		C	F
Erection Sequence	P±	C	F
P/S Beam Data Tables		C	F
Cross Frames/Diaphragm Details		C	F
Steel Girder Details	P	C	F
P/T Systems	P	C	F
Bearing Details		C	F
Expansion Joint Details		C	F
Approach Slab Details		C	F
Reinforcing Bar List		C	F
Conduit and Inspection Lighting Details		C	F
Vermin Guard		C	F
Wall Control Drawings	P	C	F
Wall Details		C	F
Non-Foundation Related Temporary Critical Wall Drawings	P	C	F
Wall Data Tables		C	F
Temp. Bridge Plan and Elevation	P	C	F
Segment Joint Coordinates/Deck Elev.		C	F
Segment Layout	P	C	F
Typical Segment Dimensions	P	C	F
Typical Segment Reinforcing		C	F
Pier Segment Dimensions	P	C	F
Pier Segment Reinforcing **		C	F
Abutment Segment Dimensions	P	C	F
Abutment Segment Reinforcing **		C	F
Expansion Joint Segment Dimensions	P	C	F
Expansion Joint Segment Reinforcing **		C	F
Deviation Segment Dimensions	P	C	F
Deviation Segment Reinforcing **		C	F
Post Tensioning Layout	P	C	F

**Table 121.14.3 Summary of Design-Build Technical Proposal and Component Plan Submittals (Continued)**

Provide the sheets listed as applicable based structure type.

**Superstructure Submittal (Continued)**

ITEM	Technical Proposal	90%	Final
P/T Details	P	C	F
Transverse P/T Details		C	F
Bulkhead Details		C	F
Drainage Layout		C	F
Drainage Details		C	F
Load Rating Summary Sheet		C	F
Developmental Standard Plans		F	F
Existing Bridge Plans		F‡‡	F
90% and Final submittals for category 2 bridges require an Independent Peer Review.			

**Status Key:**

**P** – Preliminary

**S** – Substantially Complete

**C** – Complete but subject to change

**F** – Final

**\*\*** – May require integrated drawings

**‡** – For geometrically constrained sites, show temporary stability towers in the vicinity of the underlying roadways consistent with the Traffic Control Plans. Also show temporary stability towers within navigable waterways.

**‡‡** – Widening and projects with phased construction

**Table 121.14.4 Summary of Design-Build Technical Proposal and Component Plan Submittals – Movable Bridges**

For approach span and foundation submittal requirements see **Table 121.14.3**.

Provide the sheets listed as applicable based on machinery and electrical components utilized.

**Substructure Submittal**

ITEM	Technical Proposal	90%	Final
Bascule Pier Notes		C	F
Bascule Span Elevation	P	C	F
Leaf Clearance Diagrams		C	F
Bridge Railing Clearance Diagrams		C	F
Bascule Pier North Elevation View	P	C	F
Bascule Pier South Elevation View	P	C	F
Bascule Pier East Elevation View	P	C	F
Bascule Pier West Elevation View	P	C	F
Bascule Pier Deck Plan	P	C	F
Bascule Pier Deck Elevations	P	C	F
Bascule Pier Trunnion Level Plan	P	C	F
Bascule Pier Machinery Level Plan	P	C	F
Bascule Pier Pit Plan	P	C	F
Bascule Pier Footing Plan	P	C	F
Bascule Pier Longitudinal Sections	P	C	F
Bascule Pier Transverse Sections	P	C	F
Bascule Pier Railing Details		C	F
Bascule Pier Stair Details		C	F
Bascule Pier Trunnion Access Platform Details	‡	C	F
Bascule Pier Finger Joints		C	F
Bascule Pier Deck Level Reinforcing		C	F
Bascule Pier Trunnion Level Reinforcing		C	F
Bascule Pier Machinery Level Reinforcing		C	F
Bascule Pier Pit Reinforcing		C	F
Bascule Pier Footing Reinforcing		C	F
Bascule Pier North Elevation Reinforcing		C	F
Bascule Pier South Elevation Reinforcing		C	F
Bascule Pier East Elevation Reinforcing		C	F
Bascule Pier West Elevation Reinforcing		C	F
Bascule Pier Longitudinal Section Reinforcing		C	F
Bascule Pier Transverse Section Reinforcing		C	F
Bascule Pier Reinforcing Bar List		C	F
90% and Final submittals for category 2 bridges require an Independent Peer Review.			

**Table 121.14.4 Summary of Design-Build Technical Proposal and Component Plan Submittals – Movable Bridges (Continued)**

Provide the sheets listed as applicable based on machinery and electrical components utilized.

**Superstructure Submittal**

ITEM	Technical Proposal	90%	Final
Control House General Notes		C	F
Control house Reflected Ceiling Plan		C	F
Control House Access Bridge Dimensions	‡	C	F
Control House Access Bridge Reinforcing		C	F
Control House Access Bridge Bar List		C	F
Control Tower Floor Plans	P	C	F
Control Tower Sections	P	C	F
Control Tower Reinforcing Plans		C	F
Control Tower Reinforcing Elevations		C	F
Control Tower Section Reinforcing		C	F
Control Tower Bar List		C	F
Control Tower Schedules		C	F
Control Tower Elevations	P	C	F
Control Tower Building Sections		C	F
Control Tower Details		C	F
Control Tower Stair Plans		C	F
Control Tower Stair Sections		C	F
Control Tower Roof		C	F
Control Tower Door and Window Types and Details		C	F
Control Tower Architectural Details		C	F
Control Tower HVAC Notes		C	F
Control Tower HVAC and Plumbing Floor Plans		C	F
Control Tower HVAC and Plumbing Elevations		C	F
Bascule Leaf Notes		C	F
Bascule Leaf Framing Plan and Longitudinal Section	P	C	F

**Table 121.14.4 Summary of Design-Build Technical Proposal and Component Plan Submittals – Movable Bridges (Continued)**

Provide the sheets listed as applicable based on machinery and electrical components utilized.

**Superstructure Submittal (Continued)**

ITEM	Technical Proposal	90%	Final
Bascule Leaf Transverse Sections at Floorbeams	P	C	F
Bascule Leaf Transverse Sections at Trunnion	P	C	F
Bascule Leaf Transverse Sections at Counterweight Girders	P	C	F
Main Girder Elevation	P	C	F
Main Girder Details		C	F
Main Girder Web Geometry and Camber Details		C	F
Main Girder Force Diagrams		C	F
Main Girder Reaction Influence Lines		C	F
Main Girder Moment Influence Lines		C	F
Floorbeam Details		C	F
Counterweight Girder Details		C	F
Stringer Details		C	F
Lateral Bracing Details		C	F
Counterweight Bracing Plan and Details		C	F
Counterweight Bracing Sections and Details		C	F
Counterweight Plan		C	F
Counterweight Longitudinal Sections		C	F
Counterweight Transverse Sections		C	F
Counterweight Details and Reinforcing Bar List		C	F
Bridge Deck Panel Layout		C	F
Bridge Deck Panel Sections		C	F
Bridge Deck Panel Details		C	F
Armored Joint Details		C	F
Span Lock Housing Details		C	F
Bascule Leaf Jacking Details and Notes		C	F
Mechanical General Notes	P	C	F
Mechanical Equipment Schedules	P	C	F
Drive Machinery Layout	P	C	F
Machinery Support Details		C	F

**Table 121.14.4 Summary of Design-Build Technical Proposal and Component Plan Submittals – Movable Bridges (Continued)**

Provide the sheets listed as applicable based on machinery and electrical components utilized.

**Superstructure Submittal (Continued)**

ITEM	Technical Proposal	90%	Final
Trunnion Assembly Details	P	C	F
Open Gearing Details	P	C	F
Rack/Rack Frames and Rack Pinion Details	P	C	F
Mechanical Bearing Details	P	C	F
Drive Hydraulic Cylinders Details	P	C	F
Hydraulic System Layout/Piping Details	P	C	F
Hydraulic Cylinder Support Assemblies	P	C	F
Hydraulic System Details	P	C	F
Live Load Shoe Details	P	C	F
Centering Device Details		C	F
Span Lock Assembly Details	P	C	F
Control Tower – Control Console and Operator’s Visualization Geometry Analysis Including CCTV Locations	P	C	F
Electrical General Notes	P	C	F
Electrical Site Plan	P	C	F
Conduit Riser Diagram	P	C	F
Single Line Diagram	P	C	F
Electrical Symbol Legend	P	C	F
Lighting and Equipment Plan (Including Control Tower Lighting, Fire Detection and Lighting Panel Schedules)	P	C	F
Lightning Protection, Bonding, and Grounding Plan	P	C	F
Navigation Lighting Plan	P	C	F
Communication Equipment Plan	P	C	F
Control Panel Details	P	C	F
Control Console Details	P	C	F
Block Diagram of Operating Sequence	P	C	F
Control System Architecture Diagram	P	C	F
Schematic Diagrams of all Control Systems and Interlocks	P	C	F



**Table 121.14.4 Summary of Design-Build Technical Proposal and Component Plan Submittals – Movable Bridges (Continued)**

Provide the sheets listed as applicable based on machinery and electrical components utilized.

**Superstructure Submittal (Continued)**

ITEM	Technical Proposal	90%	Final
Control System I/O Points	P	C	F
Ladder Logic for PLC		C	F
Submarine Cable/Submarine Cable Termination Cabinet Details	P	C	F
Fire and Security Panel Schematic Diagram	P	C	F
CCTV Plan and Elevation	P	C	F
Limit Switch Development	P	C	F
Conduit and Cable Schedule	P	C	F
Electrical Equipment Layout - Including but not limited to Generators, Motors, Control Console, Control Panels, and Motor Control Center.	P	C	F
CCTV Layout		S	F

**Status Key:**

- P** – Preliminary
- S** – Substantially Complete
- C** – Complete but subject to change
- F** – Final
- ‡ – Where required for project.

## **121.15 Review for Constructability and Maintainability**

### **121.15.1 Purpose**

The purpose of this review is to provide reasonable and practical use of fabrication and construction techniques and equipment without overloading and overstressing components, provide for proper material handling and transportation, provide safe maintenance of traffic and provide an appropriate construction sequence. Additionally, provide features which will retard bridge deterioration, permit reasonable access to all parts of the bridge for inspection and performance evaluation and provide features to facilitate replacement of damaged and deteriorated bridge components.

### **121.15.2 Responsibility**

For Category 1 and 2 Structures, it will be the responsibility of the District Project Manager, or his/her designee, to coordinate a review of both the 30% and 90% Structures Plans submittals by the appropriate District Construction and Maintenance personnel for constructability and maintainability. For Category 1 Structures, technical issues will be resolved to the satisfaction of the appropriate DSDE. For Category 2 Structures, technical issues will be resolved to the satisfaction of the SDO.

The Construction and Maintenance Offices should be given adequate time to perform these reviews. All comments from these reviews will be addressed prior to the next submittal and its subsequent review.

Modification for Non-Conventional Projects:
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Delete <b>FDM 121.15</b> and see the RFP for requirements.
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## **121.16 Review for Biddability**

### **121.16.1 Purpose**

To prevent construction problems, the District Construction Office will review the plans to make certain the plans are clearly understandable, contain all pertinent notes and have sufficient and correct pay items. During the biddability review, the Construction Office will check for the interface with the roadway segment of the project, utility agreements and environmental permits.

## 121.16.2 Responsibility

For Category 1 and 2 Structures, it will be the responsibility of the District Project Manager to coordinate a review of the 90% Structures Plan submittal. This review should occur at the same time as the Phase III Plans submittal for the roadway segments of the project.

Additionally, for Category 2 Structures, it will be the responsibility of the Structures Design Office to coordinate a review of the 90% Structures Plans submittal.

The Construction Offices should be given adequate time to perform these reviews. All comments from these reviews are required to be addressed prior to the 100% Structures Plans Stage submittal.

Modification for Non-Conventional Projects:

Delete **FDM 121.16**.

## 121.17 Bridge Load Rating

Perform load rating analysis of new or existing bridges in accordance with the **AASHTO Manual for Bridge Evaluation** as amended by the [Structures Manual, Volume 1](#) and the [Bridge Load Rating Manual \(Topic 850-010-035\)](#).

For new bridges the Engineer of Record is required to load rate the bridge(s) and submit the calculations with the 90% plan submittal.

Prior to developing the scope-of-work for bridge widening or rehabilitation projects, the Department or their consultant will determine the suitability of the bridge project using the load rating. If the existing load rating is inaccurate or was performed using older methods (e.g., load factor), perform a new load rating using the procedures outlined in the [Structures Manual, Volume 1 - Structures Design Guidelines, Chapter 7](#). Submit load rating calculations for the entire structure (existing and new) with the 90% plan submittal for the project.

Modification for Non-Conventional Projects:

Delete **FDM 121.17** and see the RFP for requirements.

## **121.18 Review of Non-FDOT Funded Projects (New Construction)**

Department review will be required whenever a privately funded structure crosses over Department owned right of way or when such work otherwise affects such a route; i.e., lane closures, access, R/W changes. FHWA review will be required whenever a privately funded structure crosses over an interstate route, or when such work otherwise affects such a route; i.e., lane closures, access, R/W changes. The extent of the Department and FHWA review is that:

- (1) Plans will meet all current clearance requirements (vertical and horizontal).
- (2) Review and approve the maintenance of traffic scheme for construction.
- (3) Securely fasten all attachments to the structure over the highway must be.
- (4) Design will be sealed by a licensed professional engineer.
- (5) Design will be in accordance with a nationally recognized code such as AASHTO, ACI, AISC.
- (6) Plans will meet all District permit requirements and procedures.
- (7) Submit to FHWA for approval only projects over or affecting a NHS facility.
- (8) Department review for these structures will be performed by the District Structures Design Office for Category 1 and State Structures Design Office for Category 2 Structures.

## 121.19 Precast Alternate Development

### 121.19.1 Precast Feasibility Assessment Questions:

Several negative responses to the following questions may indicate precasting is not feasible for the project. In this case, provide a statement in the BDR stating that precasting is not feasible and indicate the reasons why in order to satisfy the requirements of **FDM 121.9.1, #9**.

- (1) Will precasting reduce traffic impacts? Factors may include: average traffic volumes being affected, detour lengths and durations, lane reductions and duration.
- (2) Is this structure likely to be on the critical path for construction of the project or is this structure on a hurricane evacuation route which requires accelerated delivery?
- (3) Is the size of the project large enough to benefit from economy of scale, assembly line construction processes, and is it large enough to capitalize on a construction learning curve?
- (4) Is precasting practical given the project aesthetics when component lifting weights are considered?
- (5) Is precasting practical given project variability? Factors may include: formwork reuse, multiple construction methods and steps, and variable equipment requirements.
- (6) Does the project site have space within FDOT R/W to use as a near-site casting yard and can precast elements be hauled from likely near-site casting yard locations to the site?
- (7) Can precast elements be hauled from likely off-site prestressed yard locations to the site?
- (8) Are the lifting weights practical given the assumed equipment, construction access, and construction methods?
- (9) Can connection details be developed with the following characteristics:
  - (a) Durable?
  - (b) Easily inspected during construction?
  - (c) Accommodates shaft/pile placement tolerances?
  - (d) Accommodates fit up?
  - (e) Accommodates differential camber (full-depth deck panels)?

## 121.19.2 Assessment Matrix

**Table 121.19.1** is a tool that may be used in documenting the decision making process for evaluation of precast construction versus conventional cast-in-place construction. **Table 121.19.2** is a sample Alternate Cost Summary Table indicating how to summarize the component cost estimates and their sum.

**Table 121.19.1 Sample Assessment Matrix**

*- example values in italics -*

Selection Factor	Factor Weight (%)	PRECAST		CONVENTIONAL	
		Score (0 to 5)	Weighted Score*	Score (0 to 5)	Weighted Score*
Total Direct Costs	<i>40</i>	<i>4</i>	<i>160</i>	<i>5</i>	<i>200</i>
Total Indirect Costs	<i>10</i>	<i>5</i>	<i>50</i>	<i>4</i>	<i>40</i>
Factor 3 - <i>Constructability</i>	<i>25</i>	<i>3</i>	<i>75</i>	<i>4</i>	<i>100</i>
Factor 4 - <i>Traffic Impacts</i>	<i>0</i>				
Factor 5 - <i>Construction Duration</i>	<i>0</i>				
Factor 6 - <i>Durability</i>	<i>0</i>				
Factor 7 - <i>Environmental Impacts</i>	<i>10</i>	<i>5</i>	<i>50</i>	<i>2</i>	<i>20</i>
Factor 8- <i>Aesthetics</i>	<i>15</i>	<i>5</i>	<i>75</i>	<i>3</i>	<i>45</i>
Factor 9 - <i>Other</i>	<i>0</i>				
Factor 10 - <i>Other</i>	<i>0</i>				
<b>TOTAL (<math>\Sigma</math> Factor Weights = 100%)</b>	<b><i>100</i></b>		<b><i>410</i></b>		<b><i>405</i></b>
<b>TOTAL (Excluding Indirect Cost Factor)**</b>	<b><i>90</i></b>		<b><i>360</i></b>		<b><i>365</i></b>

\*Weighted Score = Factor Weight x Score \*\*See following explanation, Instructions "6."

## 121.19.3 Assessment Matrix Instructions

- (1) **List Selection Factors** to be used to evaluate the applicability of alternates to meet the goals of the project. Factors are project specific and always include Total Direct Costs and Total Indirect Costs (road user costs) and may include some of the following: Constructability, Traffic Impacts (e.g., Maintenance of Traffic, Detours, Traffic Delays), Construction Duration, Durability, Environmental Impacts, and Aesthetics. Include other Factors as required to capture any unique project characteristics that are not otherwise addressed. Note that as many or as few criteria may be used in the assessment matrix as deemed appropriate by the designer; though, a sufficient number of Selection Factors (i.e., criteria) are required to provide a thorough evaluation of the alternates being considered to meet the objectives of the project. When choosing selection factors and applying factor weights avoid double counting benefits. For instance, indirect costs and traffic impacts may be related selection factors.

Costs of precast versus conventional may be affected by:

- Savings associated with labor rates and insurance costs for reduced time working from a barge on a large water project.
  - Savings associated with structural efficiencies resulting from precasting (e.g., composite dead loads in the case of shored deck casting).
  - Savings associated with simultaneous substructure and superstructure component construction.
  - Savings associated with increased productivity rates of precasting.
- (2) **Construct** a two-dimensional table allowing one row for each Selection Factor and two columns for each alternate, one for Score and one for Weighted Score.
  - (3) **Factor Weights** to distinguish the level of importance of each criterion relative to the other criteria in achieving the project objectives. Weighting the various factors will usually require Department/District input. Distribute the Factor Weights such that their sum is equal to 100%.
  - (4) **Score** the relative difference between alternates. Range of scores can vary for a given project (e.g., 0 to 5 or 0 to 10). Scoring may be accomplished by a committee and then the average score for each Selection Factor entered into the matrix.
  - (5) **Calculate** the Weighted Score by multiplying the Factor Weight by Score for each alternate.
  - (6) **Total** the Weighted Score columns: (1) Provide the absolute total of each column, which includes the Indirect Costs Score and, (2) Provide the column total *excluding* the contribution from the “Total Indirect Costs.” It is useful for management to compare the impacts, both relative and in hard dollar amounts, of indirect costs on bridge construction projects when making their decisions. *The column with the largest total weighted score theoretically indicates the alternate which most closely meets the project objectives as implicated by the matrix construct.*

**Table 121.19.2 Sample Alternate Cost Summary**

Alternate	Direct Costs* (\$)	Indirect Costs**							Sum: Direct + ΣIndirect (\$)
		Lane Closures		Detour Time		Facility Closure		ΣIndirect ( \$ )	
		Days (#)	\$/Day	Days (#)	\$/Day	Days (#)	\$/Day		
Precast 1									
Precast 2									
Conventional 1									
Conventional 2									

\* In calculation of Direct Costs, give specific consideration to factors that will:

- (1) Increase the cost of the bridge, as necessary to accommodate:
  - (a) Self-propelled modular transporters (SPMTs)
  - (b) Large capacity cranes
  - (c) Special erection equipment
  - (d) Casting yard setup
- (2) Decrease the cost of the bridge, as necessary to accommodate:
  - (a) Reduced labor rates (e.g., work from barges)
  - (b) Reduced maintenance of traffic (MOT) work restrictions
  - (c) Reduced worker compensation insurance rates (e.g., work from barges)
  - (d) Increased production rates due to assembly line processes.
  - (e) Increased production rates due to multiple crews working simultaneously

\*\* Use engineering judgment and knowledge of construction processes to estimate the number of days required for each lane closure, detour, or facility closure for each alternate. Coordinate this estimate with the preliminary construction schedule and MOT scheme.

### 121.19.4 Referenced Links

- (1) Connection Details for Prefabricated Bridge Elements and Systems  
<http://www.fhwa.dot.gov/bridge/prefab/if09010/>
- (2) Manual on Use of Self-Propelled Modular Transporters to Remove and Replace Bridges  
<http://www.fhwa.dot.gov/bridge/pubs/07022/>



- (3) Framework for Decision-Making  
<http://www.fhwa.dot.gov/bridge/prefab/framework.cfm>
- (4) Prefabricated Bridge Elements and Systems Cost Study: Accelerated Bridge Construction Success Stories  
<http://www.fhwa.dot.gov/bridge/prefab/successstories/091104/index.cfm>
- (5) FDOT RUC (Road User Cost) software (*only available through infonet*)  
<http://infonet.dot.state.fl.us/tlconstruction/SchedulingEng/AddSoftwareScheduling.htm>

## 122 Design Exceptions and Design Variations

### 122.1 General

The Department's design criteria and standards contained in the FDOT Design Manual are usually within the desirable ranges established by AASHTO. The values given have been accepted by the Federal Highway Administration (FHWA) and govern the design process. When it becomes necessary to deviate from the Department's criteria, early documentation and approval are required. There are two approval processes used by designers: Design Exceptions and Design Variations.

When the Department's criteria are not met, a Design Exception or Design Variation is required. This requirement applies to all entities affecting planning, design, construction and maintenance.

For projects using safety funds and developed to improve specific safety problems, only the elements identified under the scope of work for the safety improvement project are subject to these approval processes. Existing non-compliant features, within the limits of a safety improvement project do not require approval to remain, if the project does not create a non-compliant condition. The Safety Study must identify all applicable Variations and Exceptions required based on the proposed scope. For these projects, all applicable Design Variations and Design Exceptions must be approved prior to the beginning of the design phase.

For drainage projects, only elements identified in the scope of services for the drainage project are subject to these approval processes. The existing features, within the limits of the drainage project that do not meet design criteria, do not require approval to remain (if the project does not create a nonconforming condition).

Maintenance Resurfacing, Ride Rehabilitation and Skid Hazard Projects do not require Design Exceptions or Design Variations other than for ADA curb ramp requirements. If compliance with ADA curb ramp requirements is determined to be technically infeasible, documentation as a Design Variation is required. Maintenance Resurfacing Projects can only be programmed on routes that meet the requirements identified in **Chapter 28** of the [Work Program Instructions](#).

For Landscape Only projects, intersection sight distance Design Variations may be processed by the Responsible Landscape Architect of Record. For design projects with landscaping, intersection sight distance Design Variations must be processed by a Professional Engineer. In cases where intersection sight distance falls below stopping sight distance, a Design Exception for stopping sight distance must be processed by the respective professional according to the above guidelines.

## 122.2 Identification

To allow time to research alternatives and begin the analysis and documentation activities, it is important that proper approval processes be identified as early as possible in the Planning and Design phases. This is preferably done during the PD&E process for major projects and the scope development process for minor projects. It is required that approval be obtained no later than Phase I submittal.

**Design Exceptions** are required when proposed design elements are below both the Department's governing criteria and AASHTO's new construction criteria for the Controlling Design Elements.

The 10 Controlling Design Elements for high speed (Design Speed  $\geq$  50 mph) roadways are:

- |                             |   |
|-----------------------------|---|
| (1) Design Speed            | (6) Stopping Sight Distance             |
| (2) Lane Width              | (7) Maximum Grade                       |
| (3) Shoulder Width          | (8) Cross Slope                         |
| (4) Horizontal Curve Radius | (9) Vertical Clearance                  |
| (5) Superelevation Rate     | (10) Design Loading Structural Capacity |

The 2 Controlling Design Elements for low speed (Design Speed  $<$  50 mph) roadways are:

- (1) Design Speed
- (2) Design Loading Structural Capacity

**FDM 122.5** provides AASHTO's minimum requirements for the above elements.

**Design Variations** are required when proposed design elements are below the Department's criteria and where a Design Exception is not required.

Modification for Non-Conventional Projects:

See RFP for additional requirements.

### **122.3 Justification for Approval**

Sufficient detail and explanation must be provided to those reviewing the request to justify approval. The 10 Controlling Design Elements are considered safety related and the strongest case possible must be made to lower these requirements. At some point, this justification may be used to defend design decisions made by the Department and the designer. All deviations from Department criteria and standards must be uniquely identified, located, and justified; no blanket approvals are given.

A strong case can be made if it can be shown that:

- (1) The required criteria are not applicable to the site specific conditions.
- (2) The project can be as safe by not following the criteria.
- (3) The environmental or community needs prohibit meeting criteria.

Most often a case is made by showing the required criteria are impractical and the proposed design wisely balances all design impacts. The impacts required for documentation are:

- (1) Safety and Operational performance
- (2) Level of Service
- (3) Right of Way impacts
- (4) Community impacts
- (5) Environmental impacts
- (6) Costs
- (7) Usability by all modes of transportation, Long term and cumulative effects on adjacent sections of roadway

A case should not be made based solely on the basis that:

- (1) The Department can save money.
- (2) The Department can save time.
- (3) The proposed design is similar to other designs.

## 122.4 Documentation for Approval

Supporting documentation that is generated during the approval process is to accompany each submittal.

Design Exceptions and Design Variations needing Central Office approval should include the following documentation:

- (1) Submittal/Approval Letter (**Form 122-A**, see **FDM 103**)
- (2) Project Description: general project information, location map, existing roadway characteristics, project limits (mileposts), county section number, work mix, objectives, and obstacles. Include any associated or future limitations that exist as a result of public or legal commitments.
- (3) Project Schedule and Lifespan: Include the letting date and other important production dates associated with the project. Provide a discussion of whether the Design Exception is a temporary or permanent condition. Include any future work planned or programmed to address the condition.
- (4) Exception/Variation Description:
  - (a) Specific design criteria that will not be met (AASHTO, Department value, or standard). Detailed explanation of why the criteria or standard cannot be complied with or is not applicable. Description of any proposed value for the project or location and why it is appropriate.
  - (b) A plan view, plan sheet, or aerial photo of the Design Exception location, showing right of way lines, and property lines of adjacent property. A photo of the area of the deficiency.
  - (c) Typical section or cross-section of the Design Exception location.
  - (d) The milepost and station location of the Design Exception.
- (5) Alternative Designs Considered: meeting Department criteria, meeting AASHTO criteria, partial correction, and the no-build (existing) condition.
- (6) Impacts of the Exception/Variation to:
  - (a) Safety Performance:
    - i. Description of the anticipated impact on safety, long and short term effects. Description of any anticipated cumulative effects.
    - ii. Summary of the most recent 5-year crash history including any pertinent crash reports.

- iii. For non-existing or proposed conditions, a comparison of the predicted or expected crash frequency should be included along with a discussion of the 5-year crash history.
- (b) Operational Performance:
  - i. Description of the anticipated impact on operations, long and short term effects. Description of any anticipated cumulative effects.
  - ii. Traffic information: Amount and character of traffic using the facility.
  - iii. Compatibility of the design with adjacent sections of roadway.
- (7) Effects on capacity (proposed criteria vs. AASHTO) using an acceptable capacity analysis procedure and calculate reduction for design year, level of service.
- (8) Right-of-way
- (9) Community
  - (a) Environment
  - (b) Usability by all modes of transportation
- (10) Costs: Description of the anticipated costs associated with the Design Exception or Variation.
- (11) Mitigation Measures: Description and explanation of any practical mitigation measures or alternatives that were considered and any selected treatments implemented on the project.
- (12) Summary and Conclusions

## 122.5 AASHTO Controlling Elements

AASHTO criteria, required documentation, and mitigation strategies for the controlling elements is provided in the following sections. Detailed discussions on criteria and mitigation are provided in the AASHTO Green Book: ***A Policy on Geometric Design of Highways and Streets, 2011***, and the FHWA Guide: [\*\*\*Mitigation Strategies for Design Exceptions, July 2007\*\*\*](#). The AASHTO criteria provided are in no way intended to replace Department design criteria.

The criteria used for determining Design Exceptions on Interstate projects must be based on AASHTO's ***A Policy on Design Standards Interstate System 2005***.

## 122.5.1 Design Speed

### 122.5.1.1 AASHTO Criteria

**Table 122.5.1 AASHTO Design Speed (Minimum)**

Type Facility	Other Factors	Design Speed (mph)	AASHTO	
Freeways	Urban	50	pg. 8-1, 8-2	
	Rural	70		
Urban Arterials	Major	30	pg. 2-58	
	Other	30		
Rural Arterials	Rolling terrain	50	pg. 7-2	
	Level terrain	60		
Urban Collectors	Major or Minor	30	pg. 6-11	
Rural Collectors	Level ADT	< 400	40	pg. 6-2, Table 6-1
		400 - 2000	50	
		> 2000	60	
	Rolling ADT	< 400	30	
		400 - 2000	40	
		> 2000	50	
Ramps	Highway Design Speeds (mph)			pg. 10-89, Table 10-1
		30	15	
		35	18	
		40	20	
		45	23	
		50	25	
		55	28	
		60	30	
		65	30	
	70	35		
Loop Ramps	Minimum	25	pg. 10-89	
Connections	Direct	40	pg. 10-90	
	Semi-Direct	30		

### 122.5.1.2 Documentation

Provide the length of section with reduced design speed compared to the overall length of the project. Include any existing or proposed measures used within the transitions to adjacent roadway sections having higher or lower design (or operating) speeds.

### 122.5.1.3 Mitigation

A potential mitigation strategy is to use cross-sectional elements to reduce operating speeds to the design speed.

## 122.5.2 Lane Width

### 122.5.2.1 AASHTO Criteria

**Table 122.5.2 AASHTO Lane Width (Minimum)**

Type Facility	Lane Width (feet)	AASHTO
Freeway (including Auxiliary)	12	pg. 8-2, 10-76, DSIS pg.3 <sup>(1)</sup>
Rural Arterial	11	pg. 7-5, Table 7-3
Urban Arterial	10	pg. 7-29
Urban Collector	10	pg. 6-13
Rural Collector	10	pg. 6-6, Table 6-5
Low Speed	10	pg. 4-7
Residential	9	pg. 4-8
Auxiliary (Non-Freeway)	10	pp. 4-8, 6-13
Continuous TWLTL	10	pg. 4-8

Notes:

(1) DSIS = AASHTO's *A Policy on Design Standards Interstate System* (January 2005).

### 122.5.2.2 Documentation

Provide locations of alternative routes that meet criteria and a proposal for handling drainage. Include a typical section or plan of the proposed signing and pavement markings associated with the lane width exception.



### 122.5.2.3 Mitigation

Potential mitigation strategies for lane width are:

- (1) Select optimal combination of lane and shoulder widths based on site characteristics to optimize safety and operations by distributing available cross-sectional width
- (2) Signing to provide advanced warning of lane width reduction;
- (3) To improve the ability to stay within the lane:
  - (a) Wide, recessed, or raised pavement markings
  - (b) Delineators
  - (c) Lighting
  - (d) Audible and vibratory treatment, (See **FDM 210.4.6** for arterials and collectors. See **FDM 211.4.4** for LA Facilities.)
- (4) To improve the ability to recover if the driver leaves the lane:
  - (a) Paved or partially-paved shoulders
  - (b) Safety edge treatment
- (5) To reduce crash severity if the driver leaves the roadway (See **FDM 215**):
  - (a) Remove or relocate fixed objects
  - (b) Traversable slopes
  - (c) Breakaway safety hardware
  - (d) Shield fixed objects and steep slopes

## 122.5.3 Shoulder Width

### 122.5.3.1 AASHTO Criteria

**Table 122.5.3 AASHTO Shoulder Widths (Minimum)**

Type Facility	Other Factors	Median (feet)	Right (feet)	AASHTO
Freeway	4 lanes	4 paved	10 paved	pg. 8-3
	≥ 6 lanes	10 paved	10 paved	pg. 8-3
Rural Arterial	ADT > 2000		8	pg. 7-5, Table 7-3
	ADT 400-2000		6	
	ADT < 400		4	
	4 lane Divided	4 paved	8	pg. 7-13
	6+ lane Divided	8	8	pg. 7-14
Urban Arterial	Low Type (Gravel, Other)		2	pg. 4-10
	High Type (Asphalt, Conc.)		10	pg. 4-10
	Heavily Traveled/High Speed/High Trucks		10	pg. 4-10
Rural & Urban Collector	ADT > 2000		8	pg. 6-6, Table 6-5
	ADT 1500-2000		6	
	ADT 400-1500		5	
	ADT < 400		2	

**Table 122.5.4 AASHTO Bridge Widths (Minimum)**

Type Facility	Other Factors	Bridge Widths		AASHTO
Freeway	New Bridges	Approach Roadway Width		pg. 8-4
Rural Arterial	New Bridges (Short)	Approach Roadway Width		pg. 7-6
	New Bridges (Long) (> 200 ft.)	Travel Lanes + 4 ft. each side		pg. 7-6
	Existing bridges	Travel Lanes + 2 ft. each side		pg. 7-6
Urban Arterial	New and Existing Bridges (Short)	Curb to curb width of street		pg. 7-38
	New and Existing Bridges (Long) without shoulders or parking on arterial	Curb to curb width of street		pg. 7-38
	New and Existing Bridges (Long) with shoulders or parking on arterial	Travel Lanes + 4 ft. each side		pg. 7-38
Type Facility	Other Factors	Bridge Widths		AASHTO
		New or Reconstruction	To Remain	
Rural and Urban Collector	ADT Under 400	Traveled Way + 2 ft. each side <sup>(1)</sup>	22 ft. <sup>(2)</sup>	pg. 6-7, 8 Table 6-6, Table 6-7
	ADT 400-1500	Traveled Way + 3 ft. each side <sup>(1)</sup>	22 ft. <sup>(2)</sup>	
	ADT 1500-2000	Traveled Way + 4 ft. each side <sup>(1),(3)</sup>	24 ft. <sup>(2)</sup>	
	ADT > 2000	Approach Roadway Width <sup>(1),(3)</sup>	28 ft. <sup>(2)</sup>	
<p>Notes:</p> <p>(1) If the approach roadway has paved shoulders, then the surfaced width must be carried across the bridge.</p> <p>(2) Bridges longer than 100 ft. are to be analyzed individually.</p> <p>(3) For bridges &gt; 100 ft. in length, the minimum bridge width of traveled way plus 3 ft. on each side is acceptable.</p>				

### 122.5.3.2 Documentation

Provide a proposal to address stalled vehicles, enforcement activities, emergency operations, and drainage in the documentation for the exception.

### 122.5.3.3 Mitigation

Potential mitigation strategies for shoulder width are:

- (1) Select optimal combination of lane and shoulder width based on site characteristics to optimize safety and operations by distributing available cross-sectional width
- (2) Signing to provide advanced warning of lane width reduction
- (3) To improve the ability to stay within the lane:
  - (a) Wide, recessed or raised pavement markings
  - (b) Delineators
  - (c) Lighting
  - (d) Audible and vibratory treatment, (See **FDM 210.4.6** for arterials and collectors. See **FDM 211.4.4** for LA Facilities.)
- (4) To improve the ability to recover if the driver leaves the lane:
  - (a) Paved or partially-paved shoulders
  - (b) Safety edge treatment
- (5) To reduce crash severity if driver leaves the roadway (See **FDM 215**):
  - (a) Remove or relocate fixed objects
  - (b) Traversable slopes
  - (c) Breakaway safety hardware
  - (d) Shield fixed objects and steep slopes

## 122.5.4 Horizontal Curve Radius

### 122.5.4.1 AASHTO Criteria

**Table 122.5.5 AASHTO Horizontal Alignment**

Minimum Radius (feet) with Superelevation (page 3-32, Table 3-7)

Type Facility	Super-elevation e-max	Minimum Curve Radius (feet) for Design Speed (mph)											
		15	20	25	30	35	40	45	50	55	60	65	70
Rural Highway and High-Speed Urban Street	0.04	42	86	154	250	371	533	711	926	1190	1500	---	---
	0.06	39	81	144	231	340	485	643	833	1060	1330	1660	2040
	0.08	38	76	134	214	314	444	587	758	960	1200	1480	1810
	0.10	36	72	126	200	292	410	540	694	877	1090	1340	1630
	0.12	34	68	119	188	272	381	500	641	807	1000	1220	1480

Minimum Radius (feet) for Section with Normal Cross Slope (2001 AASHTO, page 168, Exh. 3-26)

Type Facility	Minimum Curve Radius (feet) for Design Speed (mph)											
	15	20	25	30	35	40	45	50	55	60	65	70
Freeway, Arterial, and Collector	960	1700	2460	3350	4390	5570	6880	8350	9960	11720	13180	14730

Minimum Radius (feet) for Intersection Curves (2001 AASHTO, page 201, Exh. 3-43)

Design Speed (mph)	10	15	20	25	30	35	40	45
Minimum Radius (feet)	25	50	90	150	230	310	430	540
Assumed Minimum Superelevation Rate	0.02	0.02	0.02	0.04	0.06	0.08	0.09	0.10

### 122.5.4.2 Documentation

No additional documentation beyond what is covered in **FDM 122.4** is required.

### 122.5.4.3 Mitigation

Potential mitigation strategies for horizontal curve radius are:

- (1) To provide advanced warning:
  - (a) Signing
  - (b) Pavement marking messages
  - (c) Dynamic curve warning systems
- (2) To provide delineation:
  - (a) Chevrons
  - (b) Post-mounted delineators
  - (c) Reflectors on barrier
- (3) To improve the ability to stay within the lane:
  - (a) Widen the roadway
  - (b) Skid-resistant pavement
  - (c) Enhanced pavement markings
  - (d) Lighting;
  - (e) Audible and vibratory treatment, (See **FDM 210.4.6** for arterials and collectors. See **FDM 211.4.4** for LA Facilities.)
- (4) To improve the ability to recover if driver leaves the lane:
  - (a) Paved or partially paved shoulders
  - (b) Safety edge
- (5) To reduce the crash severity if driver leaves the roadway(See **FDM 215**):
  - (a) Remove or relocate fixed objects
  - (b) Traversable slopes
  - (c) Breakaway safety hardware
  - (d) Shield fixed objects and steep slopes

## 122.5.5 Superelevation Rate

### 122.5.5.1 AASHTO Criteria

**Table 122.5.6 AASHTO Superelevation (Maximum)**

Type Facility	Superelevation Rate	AASHTO
Highways (Rural)	12%	pg. 3-30
Urban	6%	pg. 3-31
Urban: Low Speed w/severe constraints	None	pg. 3-31
Ramps and Turning Roadways at Intersections	10%	pg. 9-114
Note: (1) Maximum Superelevation is pro-rated value (based upon radius) from rate tables cited above.		

### 122.5.5.2 Documentation

Provide side friction factors for each curve at the PC, Midpoint, and PT of the curve, and at the location of maximum provided superelevation. For multi-lane facilities, provide values for each lane. Use the following equation:

$$f = \frac{V^2 - 15Re}{V^2e + 15R}$$

where:

- f = Side Friction Factor
- V = Design Speed (mph)
- R = Radius (feet)
- e = Superelevation (ft/ft) at the station evaluated

### 122.5.5.3 Mitigation

Potential mitigation strategies for superelevation rate exceptions are:

- (1) To provide advanced warning:
  - (a) Signing
  - (b) Pavement marking messages
  - (c) Dynamic curve warning systems
- (2) To provide delineation:
  - (a) Chevrons
  - (b) Post-mounted delineators
  - (c) Reflectors on barrier
- (3) To improve the ability to stay within the lane:
  - (a) Widen the roadway
  - (b) Skid-resistant pavement
  - (c) Enhanced pavement markings
  - (d) Lighting
  - (e) Audible and vibratory treatment, (See **FDM 210.4.6** for arterials and collectors. See **FDM 211.4.4** for LA Facilities.)
- (4) To improve the ability to recover if driver leaves the lane:
  - (a) Paved or partially paved shoulders
  - (b) Safety edge
- (5) To reduce the crash severity if driver leaves the roadway: (See **FDM 215**)
  - (a) Remove or relocate fixed objects
  - (b) Traversable slopes
  - (c) Breakaway safety hardware
  - (d) Shield fixed objects and steep slopes



## 122.5.6 Stopping Sight Distance

### 122.5.6.1 AASHTO Criteria

**Table 122.5.7 AASHTO Stopping Sight Distance (Minimum)**  
 (AASHTO page 3-4, Table 3-1)

Design Speed (mph)												
	15	20	25	30	35	40	45	50	55	60	65	70
Stopping Sight Distance (feet) Computed for Design	80	115	155	200	250	305	360	425	495	570	645	730

**Table 122.5.8 AASHTO Vertical Alignment**  
 (AASHTO Table 3-34, Table 3-36, and Table 6-3, and based on a 2' object height)

Design Speed (mph)	Minimum K Value for Vertical Curves	
	Crest	Sag
15	3	10
20	7	17
25	12	26
30	19	37
35	29	49
40	44	64
45	61	79
50	84	96
55	114	115
60	151	136
65	193	157
70	247	181

Note:  
 (1) Rate of vertical curvature, K, is the length of curve per percent algebraic difference of the intersecting grades. ( $K = L/A$ )

**Table 122.5.9 AASHTO Minimum Passing Sight Distance  
 (AASHTO page 3-9, Table 3-4)**

Design Speed (mph)											
	20	25	30	35	40	45	50	55	60	65	70
Passing Sight Distance (feet)	400	450	500	550	600	700	800	900	1000	1100	1200

### 122.5.6.2 Documentation

Provide profiles in the area of vertical alignment related Design Exception or Design Variations for stopping sight distance. Provide plan views with sight triangles for horizontal stopping sight distance evaluations.

### 122.5.6.3 Mitigation

Potential mitigation strategies for stopping sight distance are:

- (1) To mitigate sight distance restrictions
  - (a) Signing and speed advisory plaques (crest vertical curves)
  - (b) Lighting
  - (c) Adjust placement of lane within the roadway cross section (horizontal)
  - (d) Cross-sectional elements to manage speed
- (2) To improve the ability to avoid crashes:
  - (a) Cross-sectional elements
  - (b) Wider clear recovery area
- (3) To improve driver awareness on approach to intersections:
  - (a) Advance warning signs
  - (b) Dynamic warning signs
  - (c) Larger or additional STOP/YIELD signs
  - (d) Intersection lighting

## 122.5.7 Maximum Grade

### 122.5.7.1 AASHTO Criteria

**Table 122.5.10 AASHTO Grades (Maximum)**

Type Facility	Type Terrain	Grades (%) for Design Speed (mph)									AASHTO
		30	35	40	45	50	55	60	65	70	
Freeway <sup>(1)</sup>	Level	---	---	---	---	4	4	3	3	3	pg. 8-4, Table 8-1
	Rolling	---	---	---	---	5	5	4	4	4	
Rural Arterial	Level	---	---	5	5	4	4	3	3	3	pg. 7-4, Table 7-2
	Rolling	---	---	6	6	5	5	4	4	4	
Urban Arterial:	Level	8	7	7	6	6	5	5	---	---	pg. 7-29, Table 7-4
	Rolling	9	8	8	7	7	6	6	---	---	
Rural Collector <sup>(2)</sup>	Level	7	7	7	7	6	6	5	---	---	pg. 6-3, Table 6-2
	Rolling	9	9	8	8	7	7	6	---	---	
Urban Collector <sup>(2)</sup>	Level	9	9	9	8	7	7	6	---	---	pg. 6-12, Table 6-8
	Rolling	11	10	10	9	8	8	7	---	---	

Notes:

- (1) Grades one percent steeper than the values shown may be used for extreme cases in urban areas where development precludes the use of flatter grades and for one-way downgrades.
- (2) Short lengths of grade in rural and urban areas, such as grades less than 500 ft. in length, one-way downgrades, and grades on low-volume rural and urban collectors may be up to 2 percent steeper than the grades shown above.

### 122.5.7.2 Documentation

No additional documentation beyond what is in **FDM 122.4** is required.

### 122.5.7.3 Mitigation

Potential mitigation strategies for maximum grade are:

- (1) Signing to provide advanced warning
- (2) To improve ability to stay within the lane:
  - (a) Enhanced pavement markings

- (b) Delineators
  - (c) Audible and vibratory treatment, (See **FDM 210.4.6** for arterials and collectors. See **FDM 211.4.4** for LA Facilities.)
- (3) To improve ability to recover if driver leaves the roadway (See **FDM 215**):
- (a) Paved or partially-paved shoulders
  - (b) Safety edge
  - (c) Remove or relocate fixed objects
  - (d) Traversable slopes
  - (e) Breakaway safety hardware
  - (f) Shield fixed objects

## 122.5.8 Cross Slope

### 122.5.8.1 AASHTO Criteria

**Table 122.5.11 AASHTO Cross Slope**

Type Facility	Other Factors	Minimum	Maximum	AASHTO
Freeways	---	0.015	0.025 <sup>(1)</sup>	pg. 8-2
Arterials	Rural	0.015	0.02	pg. 7-4
	Urban	0.015	0.03	pg. 7-29
Divided Highways	---	0.015	0.02 <sup>(1)</sup>	pg. 7-13
Collectors	Rural	0.015	0.02	pg. 6-3
	Urban	0.015	0.03	pg. 6-13
Shoulders	Paved	0.02	0.06	pg. 4-11
	Gravel	0.04	0.06	pg. 4-11
	Turf	0.06	0.08	pg. 4-11

Note:

(1) Values given are for up to two lanes in one direction. Additional outside lanes may have cross slopes of 0.03.

### **122.5.8.2 Documentation**

Provide a proposal for handling drainage and details on how the cross slope impacts intersections.

### **122.5.8.3 Mitigation**

Potential mitigation strategies for deficient cross slope are:

- (1) Signing to provide warning of slick pavement
- (2) To improve surface friction:
  - (a) Pavement grooving (PCC Pavement)
  - (b) Open-graded friction courses (HMA pavement)
- (3) To improve drainage:
  - (a) Transverse pavement grooving (PCC Pavement)
  - (b) Open-graded friction courses (HMA pavement)
  - (c) Pavement edge drains
  - (d) Modified shoulder cross slope to mitigate cross-slope break on the high side of superelevated curves.

## 122.5.9 Vertical Clearance

### 122.5.9.1 AASHTO Criteria

**Table 122.5.12 AASHTO Vertical Clearance (Minimum)**

Type Facility		Vertical Clearance (feet) <sup>(2)</sup>	AASHTO
Freeways		16 <sup>(1),(4)</sup>	pg. 8-4, 10-21
Arterials (New Structures):	Rural	16 <sup>(1)</sup>	pg. 7-6, 10-21
	Urban	16 <sup>(1)</sup>	pg. 7-38, 10-21
Arterials (Existing Structures):	Rural	14	pg. 7-7, 10-21
	Urban	14	pg. 7-38, 10-21
Other Highways		14	pg. 5-8, 8-4
Sign Trusses		17	pg. 7-7,38, 8-4
Pedestrian Overpass		17	pg. 7-7,38, 8-4
Tunnels:	Freeways	16	pg. 4-53
	Other Highways	14	pg. 4-53
Railroads		23 <sup>(3)</sup>	pg. 10-22
Notes: (1) 14 feet allowed in highly developed urban areas if alternate route has 16 feet. (2) An allowance of 6 inches should be added to vertical clearance to accommodate future resurfacing. (3) See <b>FDM 220.3.4</b> and the latest version of <b>American Railway Engineering and Maintenance-of-Way Association (AREMA)</b> guidelines, or the design office of the high speed rail line of interest for specific high speed guidelines and specifications. Over Electrified Railroad, the minimum vertical clearance is 24 feet 3 inches. (See <b>Topic No. 000-725-003: South Florida Rail Corridor Clearance.</b> ) (4) Design Exceptions to the 16-ft vertical clearance standard on rural Interstate routes or on a single Interstate route through urban areas must be coordinated with Surface Deployment and Distribution Command Transportation Engineering Agency (SDDCTEA) as described in <b>FDM 122.5.9.2</b> .			

### 122.5.9.2 Documentation

A written evaluation of the vertical clearance deficiency and recommendation by the State Office of Maintenance is required and should be attached to all Vertical Clearance Variations and Exceptions.

Provide locations of alternative routes that meet criteria.

For Interstate Projects, the District is responsible for completing an ***Interstate Vertical Clearance Exception Coordination*** form, (<http://www.fhwa.dot.gov/design/090415.cfm>) for Design Exceptions to vertical clearance requirements above interstate facilities (mainlines and ramps). The District will submit the form to the Surface Deployment and Distribution Command Transportation Engineering Agency (SDDCTEA) via e-mail for approval, copying the FHWA Florida Division. Allow for 10 working days after SDDCTEA receipt for action before requesting notification of disposition (via email or fax). A copy of the approval must be provided with the Design Exception. A request for coordination must take place before the District Design Engineer can recommend the Design Exception.

### **122.5.9.3 Mitigation**

Potential mitigation strategies for vertical clearance are:

- (1) Signing to provide advance warning;
- (2) To prevent impacts with low structures:
  - (a) Alternate routes
  - (b) Large vehicle restrictions.
  - (c) Bridge Jacking may be a consideration to address bridges with minor deficiencies.

## 122.5.10 Design Loading Structural Capacity

### 122.5.10.1 AASHTO Criteria

**Table 122.5.13 AASHTO Structural Capacity (Minimum Loadings)**

Type Facility	AASHTO
Freeways, Arterials, and Collectors	See <i>AASHTO LRFD</i> for minimum loadings.

### 122.5.10.2 Documentation

- (1) Load rating calculations for the affected structure.
- (2) Verification of safe load-carrying capacity (load rating) for State unrestricted legal loads or routine permit loads.
- (3) Verification of Federal legal loads for bridges and tunnels on the Interstate.
- (4) A written evaluation and recommendation by the Office of Maintenance.

### 122.5.10.3 Mitigation

Potential mitigation strategies for design loading structural capacity are determined on a case by case basis.

## 122.6 Crash Analysis

For areas with crash histories or when a benefit to cost analysis is required, provide a time value analysis between the benefit to society (quantified in dollars) and the costs to society (quantified in dollars) over the life of the Design Exception. The benefit to society is quantified by the savings associated with the projected reduction in crashes. The cost to society is a summary of the construction, operation, maintenance, and other costs anticipated over the life of the project. The Discount (interest) rate to be utilized in benefit/cost analysis is 4%.

Both Historical (HCM) and Predictive (RSAP and HSM) methods are acceptable for performance of a benefit/cost analysis.



In accordance with the Department’s **Highway Safety Manual Implementation Policy (Topic No. 000-500-001)**, “the transportation analyst is encouraged to use the Highway Safety Manual (HSM) methods, where applicable, to measure safety benefits from proposed improvements.”

### 122.6.1 Historical Crash Method (HCM)

This method can be used for sites with a crash history. It is the ratio (benefit/cost) of the estimated annual reduction in crash costs to the estimated annual increase in combined construction and maintenance costs. The annualized conversion will show whether the projected expenditure of funds for the crash benefit will exceed the direct cost for the improvement.

The HCM uses the **Highway Safety Improvement Program Guideline (HSIPG)** cost per crash by facility type in **Table 122.6.1** to estimate benefit to society, while the cost to society is estimated by the expected cost of right of way, construction, and maintenance.

**Table 122.6.1 FDOT Average Crash Costs by Facility Type**

Type Facility	Divided Roadway			Undivided Roadway		
	Urban	Suburban	Rural	Urban	Suburban	Rural
2-3 Lanes	\$106,967	\$186,651	\$347,278	\$121,332	\$246,741	\$506,164
4-5 Lanes	\$116,176	\$213,668	\$461,464	\$110,657	\$183,491	n/a
6+ Lanes	\$116,034	\$154,430	\$431,516	\$31,282	n/a	n/a
Interstate	\$145,263	n/a	\$331,210	n/a	n/a	n/a
Turnpike	\$141,607	n/a	\$277,755	n/a	n/a	n/a

Notes:

(1) Average Cost/Crash: **\$151,677**

(2) The above values were derived from 2011 through 2015 traffic crash and injury severity data for crashes on state roads in Florida using the formulation described in *FHWA Technical Advisory “Motor Vehicle Accident Costs”, T 7570.2, dated October 31, 1994* and from a memorandum from USDOT, *Revised Departmental Guidance: Treatment of Economic Value of a Statistical Life (VSL) in the U.S. Department of Transportation Analyses*, dated August 8, 2016 updating the value of life saved from \$9.4 million to \$9.6 million.

(3) Link to [Revised Departmental Guidance 2013](#)

When utilizing predictive methods or crash severity distributions for analysis, the following crash severity level costs should be used:

**Table 122.6.2 FDOT KABCO Crash Costs**

Crash Severity	Comprehensive Crash Cost
Fatal (K)	\$10,560,000
Severe Injury (A)	\$599,040
Moderate Injury (B)	\$162,240
Minor Injury (C)	\$100,800
Property Damage Only (O)	\$7,600
Note: (1) Source: Florida Department of Transportation State Safety Office's Crash Analysis Reporting (CAR) System, analysis years 2011 through 2015.	

### 122.6.2 Roadside Safety Analysis Program (RSAP)

This method complements the *AASHTO Roadside Design Guide*, dated June 2011. When hazards cannot be removed or relocated, designers need to determine if a safety device, such as a guardrail or a crash cushion, is warranted to protect motorists from the roadside obstacle. This method can be used to perform a benefit/cost analysis comparing a potential safety treatment with the existing or baseline conditions (i.e., the do-nothing option) or alternative safety treatments. Based on the input of information available to the user (e.g. offsets, traffic, slopes, crash history, traffic accident severity levels), the program will offer results which can be used in comparing design alternatives.

### 122.6.3 Highway Safety Manual

The *AASHTO Highway Safety Manual (HSM)* provides analytical tools and techniques for quantifying the potential effects on crashes as a result of decisions made in planning, design, operations and maintenance. The new techniques and knowledge in the HSM reflect the evolution in safety analysis from descriptive (historical) methods to quantitative, predictive analyses. In the *HSM*, crash frequency is the fundamental basis for safety analysis and is used to reduce crashes and severities through the selection of alternative treatments.

The **HSM** includes Safety Performance Functions (SPFs) for many roadway segment and intersection applications. SPFs are equations used to estimate or predict the expected average crash frequency per year at a location as a function of traffic volume and roadway characteristics. Adjust SPFs to local conditions by applying calibration factors shown in **Table 122.6.3**. The use of HSMSPF and Crash Modification Factors (CMF), with an Empirical Bayes (EB) adjustment, provides research based solutions for use in Benefit/Cost comparisons. Crash distributions presented in **Table 122.6.4** and KABCO costs as specified in **Table 122.6.2** should be used in determining benefits from an **HSM** analysis.

**Table 122.6.3 HSM Calibration Factors for Florida**

Type Facility		Abbreviation	Calibration Factor (Cx)
<b>FDOT Roadway Calibration Factors</b>			
Rural	2-lane Undivided	R2U	1.00
	4-lane Divided	R4D	0.68
Urban	2-lane Undivided	U2U	1.02
	3-lane with a Center Two-Way Left Turn Lane	U32LT	1.04
	4-lane Undivided	U4U	0.73
	4-lane Divided	U4D	1.63
	5-lane with a Center Two-Way Left Turn Lane	U52LT	0.70
<b>FDOT Intersection Calibration Factors</b>			
Rural	2-lane 3-Leg Stop-Controlled	RTL3ST	1.27
	2-lane 4-Leg Stop-Controlled	RTL4ST	0.74
	2-lane 4-Leg Signalized	RTL4SG	0.92
	Multilane 3-Leg Stop-Controlled	RML3ST	2.20
	Multilane 4-Leg Stop-Controlled	RML4ST	1.64
	Multilane 4-Leg Signalized	RML4SG	0.45
Urban	3-Leg Stop-Controlled Intersection	USA3ST	1.14
	4-Leg Stop-Controlled Intersection	USA4ST	1.87
	3-Leg Signalized w/o Ped. CMFs	USA3SG w/o Ped.	2.58
	3-Leg Signalized w/ Ped. CMFs	USA3SG w/ Ped.	2.50
	4-Leg Signalized	USA4SG	2.27

**Table 122.6.4 HSM Crash Distribution for Florida**

Type Facility		Abbreviation	K	A	B	C	O
Rural Roadways	2-lane Undivided	R2U	0.032	0.116	0.196	0.196	0.461
	4-lane Undivided	R4U	0.029	0.111	0.182	0.219	0.460
	4-lane Divided	R4D	0.030	0.112	0.206	0.197	0.453
Urban & Suburban Arterials	2-lane Undivided	U2U	0.009	0.062	0.166	0.223	0.540
	3-lane TWLTL	U32LT	N/A				
	4-lane Undivided	U4U	0.005	0.037	0.126	0.209	0.623
	4-lane Divided	U4D	0.008	0.055	0.158	0.239	0.540
	5-lane TWLTL	U52LT	N/A				
Freeways	Rural		0.019	0.081	0.165	0.177	0.558
	Urban		0.006	0.043	0.131	0.216	0.604
	Ramps		0.004	0.039	0.124	0.223	0.610
All	All Roadways and Ramps		0.008	0.049	0.141	0.224	0.577
<b>Notes:</b>			A - Incapacitating Injury		C - Possible (or minor) Injury		
			K – Fatality		B - Non-incapacitating Injury		
						O - Property Damage Only	

Tools and spreadsheets for use with these analytical methods have been developed and are available on the following websites:

<http://www.fdot.gov/safety/11A-SafetyEngineering/TransSafEng/HighwaySafetyManual.shtm>

<http://www.fdot.gov/roadway/QA/Tools.shtm>

## **122.7 Design Approval Request**

### **122.7.1 Submittal Package**

The submittal package is to include the following:

- (1) Cover letter: **Form 122-A** (see **FDM 103**).
- (2) Signed and Sealed Report: The signed and sealed documents including all required documentation and justification. Multiple design elements and signed and sealed reports may be included in one submittal package.
- (3) Appendices (as needed): Include any support documentation to facilitate an understanding of the report. Supplemental documents do not alter the sealed analysis or design.

Sign and seal the report in accordance with **FDM 130**. A Submittal/Approval Letter (**Form 122-A**, see **FDM 103**) is to be attached to the Sealed Report and submitted to the District or Turnpike Design Engineer. The District or Turnpike Design Engineer then approves or denies the request and notifies the Responsible Engineer. When further approvals are required, the District or Turnpike Design Engineer will forward the Submittal/Approval Letter and Sealed Report to the State Roadway Design Office.

### **122.7.2 Design Exception Approval**

The request will be reviewed by the State Roadway Design Engineer and may be forwarded for approval to the Chief Engineer, the State Structures Design Engineer, the Planning Office, and FHWA, as appropriate.

Each request will be reviewed on a case by case basis and approved on its merits. When approval is obtained, the State Roadway Design Office will email the disposition to the District or Turnpike Design Engineer along with the signed Submittal/Approval Letter. The State Roadway Design Office will keep an electronic copy filed under the assigned reference number.

When a request is denied, the State Roadway Design Office will notify the District or Turnpike Design Engineer of the disposition. Denied requests can be resubmitted when all deficiencies, noted in the denial notification, have been addressed. This may require only a new Submittal/Approval Letter if the Sealed Report does not need to be amended; however, if the Sealed Report requires revision, a new Sealed Report and attached Submittal/Approval Letter must be submitted.

### 122.7.3 Design Variation Approval

Design Variations only require District approval unless identified as requiring Central Office approval in **FDM 122.7.4** (see **Table 122.7.1**). Design Variations requiring Central Office approval from the Chief Engineer, State Roadway Design Engineer, and the State Structures Design Engineer (see **FDM 122.7.4**) follow the processes in **FDM 122.7**. Design Variations approved solely in the District may be submitted as a formal Design Variation or as a signed and sealed Design Memorandum for approval by the District or Turnpike Enterprise Design Engineer.

A formal Design Variation is required for any design criteria impacting clear zones, sight distance, or Americans with Disabilities Act (ADA) compliance. In these cases the Responsible Engineer or Professional attaches a Submittal Approval Letter (**Form 122-A**, see **FDM 103**) to the sealed report and submits the package to the District or Turnpike Design Engineer. The District or Turnpike Design Engineer then approves or denies the request and notifies the Responsible Engineer or Professional accordingly.

At a minimum, Design Variations are to include:

- (1) Design criteria versus proposed criteria.
- (2) Reason the design criteria are not appropriate.
- (3) Justification for the proposed criteria.
- (4) Review and evaluation of the most recent certified 5 years of crash history for Central Office approved Design Variations and formal District Design Variations.
- (5) Background information which documents or justifies the request.

For Lateral Offset Design Variations, provide a tabulation of stations (or mileposts) and lateral offsets for aboveground fixed objects.

### 122.7.4 Signature Requirements

Obtain all required approvals as described in this section. Approvals from multiple individuals may be required for certain issues. The Director of Design must resolve any approval authority issues if conflicting objectives arise. Approval signatures are required by the following Department and FHWA personnel as specified:

#### Chief Engineer:

- (1) Design Exceptions for Design Speed on SIS facilities, following review by the Chief Planner.

- (2) Design Variations for Design Speed on SIS facilities, following review by the Chief Planner.

**FHWA Division Administrator:**

- (1) Design Exceptions on Projects of Division Interest (PODIs).

**District (or Turnpike) Design Engineer:**

- (1) Design Exceptions
- (2) Design Variations

**State Roadway Design Engineer:**

- (1) Design Exceptions for elements other than Design Loading Structural Capacity.
- (2) Design Variations involving the use of fencing around stormwater management facilities.
- (3) Authority for approval of Design Exceptions and Design Variations on Florida Turnpike facilities has been delegated to the Turnpike Design Engineer by the State Roadway Design Engineer.

**State Structures Design Engineer:**

- (1) Design Exceptions for Shoulder Width, Design Loading Structural Capacity of bridges and Vertical Clearance impacting Category 1 and 2 bridge structures.
- (2) Design Variations for Shoulder Width, Design Loading Structural Capacity of bridges and Vertical Clearance impacting Category 2 structures.
- (3) Design Variations for Design Loading Structural Capacity due to deficient load ratings impacting both Category 1 and 2 bridge structures.
- (4) Design Variations for Traffic Railing impacting Category 1 and 2 bridge structures.
- (5) Design Exceptions or Variations involving lateral offsets or vertical clearances for railroads not meeting the requirements of **Rule 14-57 F.A.C.** or the clearance criteria for the South Florida Rail Corridor (**Topic No. 000-725-003 - South Florida Rail Corridor Clearance Policy for 25 KV service**).
- (6) Authority for approval of Design Exceptions and Design Variations for Shoulder Width and Vertical Clearance on Florida Turnpike facilities has been delegated to the Turnpike Design Engineer by the State Structures Design Engineer.

**District (or Turnpike) Structures Design Engineer:**

- (1) Design Exceptions for Shoulder Width, Design Loading Structural Capacity of all structural items and Vertical Clearance impacting Category 1 and 2 bridge structures.
- (2) Design Variations for Shoulder Width, Design Loading Structural Capacity of all structural items and Vertical Clearance impacting Category 1 bridge structures.



**Table 122.7.1 Central Office Approvals**

Design Element	State Roadway Design Engineer	State Structures Design Engineer	Chief Planner	Chief Engineer
	Approval	Approval	Review	Approval
Design Speed Exception	X			
Design Speed Exception-SIS	X		X	X
Design Speed Variation-SIS			X	X
Lane Width Exception	X			
Shoulder Width Exception	X	X		
Shoulder Width Variation (Category 2 Structures)		X		
Design Loading Structural Capacity Exception		X		
Design Loading Structural Capacity Variation				
-Category 2 Structures		X		
-Deficient Load Ratings (Category 1 and 2 Structures)		X		
-Traffic Railing (Category 1 and 2 Structures)		X		
Vertical Clearance Exception	X			
-16' for rural Interstate routes or single urban Interstate route	X			
-All Category 1 and 2 Structures	X	X		
- RR-South Fla Rail Corridor		X		
Vertical Clearance Variation (Category 2 Structures)		X		
Maximum Grade Exception	X			
Cross Slope Exception	X			
Superelevation Rate Exception	X			

**Table 122.7.1 Central Office Approvals (Cont.)**

Design Element	State Roadway Design Engineer	State Structures Design Engineer	Chief Planner	Chief Engineer
	Approval	Approval	Review	Approval
Horizontal Curve Radius Exception	X			
Stopping Sight Distance Exception	X			
Lateral Offset Variation				
-RR-South Fla Rail Corridor		X		
-Category 1 and 2 Structures	X	X		
Lateral Offset Variation (Category 2 Structure)		X		
Design Variation: Crossovers on Limited Access Facilities	X			
Design Variation: Patterned Pavement Technical Special Provisions	X			
Design Variation: Use of fencing around stormwater management facilities	X			
Roundabout Designs-All	X			
Colored Bike Lane Assessments (The first 3 years after installation)	X			
Design Variation: Community Aesthetic Features Non-Interstate	X			
Design Variation: Community Aesthetic Features Interstate (FHWA)	X			

## 123 Engineering Design Estimate Process

### 123.1 General

The construction cost estimate (Authorization Estimate) is one of the last activities performed during the design phase. Use the following items to develop a construction cost estimate:

- (1) The contract plans set, including all component sets; e.g., structures, architectural.
- (2) The specifications, including the supplemental specifications and technical special provisions.
- (3) The Standard Plans referenced on the key sheet of the contract plans.
- (4) The current [Basis of Estimates Manual](#).

Modification for Non-Conventional Projects:

Delete **FDM 123.1** and replace with the following:

### 123.1 General

The construction cost estimate (Authorization Estimate) is one of the last activities performed on design projects prior to beginning the procurement process. Use the following items to develop a construction cost estimate:

- (1) The Concept Plans including a summary of quantities, if available;
- (2) The Request for Proposal.

### 123.2 Basis of Estimates

The [Standard Specifications](#) establish the method of measurement, basis of payment, and pay items for work specified for road and bridge construction. The [Basis of Estimates Manual](#) contains design aids, notes, the pay item structure, a list of currently open pay items, and computation information to aid the engineer in preparing the cost estimate.

Pay items for the various categories of construction work should be identified as those components are completed. For example, pay items for base and pavement work may be identified as the pavement design is completed; signal pay items may be identified as the signal design is completed. The engineer doing the design and specifications should

be knowledgeable about what work is to be done and which pay items are needed. The quantity take-off is generally performed at a later date when the plans are final and the tabulations and calculations are completed. The persons doing the quantity take-off should also ensure that all pay items have been identified.

Use the [Basis of Estimates Manual](#) to identify pay items on all types of projects, e.g., resurfacing, widening, safety, bridge. If any work on a project is not covered by existing specifications, then a technical special provision and possibly a new pay item description, unit of measure, and basis of payment may be required. If a desired pay item is not available, contact the FDOT Project Manager or District Estimates Office for assistance. Additional details for requesting pay items are available in **Chapter 6** of the [Basis of Estimates Manual](#).

Modification for Non-Conventional Projects:

Delete **FDM 123.2**.

### **123.3 Designer Interface for AASHTOWare Project Preconstruction™ (formerly Trns•port)**

The Designer Interface, available through the Program Management Office webpage via the Webgate login, is used to build categories and to add pay items and quantities to categories. Contact the District Estimates Office for more information.

Modification for Non-Conventional Projects:

Delete **FDM 123.3** and replace with the following:

### **123.3 Designer Interface for AASHTOWare Project Preconstruction™ (formerly Trns•port)**

Use **Chapter 11** of the [Basis of Estimates Manual](#) to select the design-build pay items.

## **123.4 Estimated Quantities**

### **123.4.1 Summary of Quantities**

All quantities for pay items are tabulated and totaled on Summary of Quantity sheets in the plans. The summary boxes should be organized in pay item sequence for the project. See the [Basis of Estimates Manual](#) for further details. Place detailed documentation on calculations in the project's Calculations folder and included in the CADD\_[FPID].ZIP file with the Final Plans Submittal. See the [CADD Manual](#) for details. Summary of Quantity sheets in the plans should be completed in accordance with **FDM 307**.

#### **123.4.1.1 Plan Quantity**

The Department's current practice is to provide for final payment under the plan quantity concept for a large number of commonly used items. Refer to the [Standard Specifications](#) to determine if an item is paid by plan quantity. This concept requires that the estimated quantities be calculated and documented as accurately as possible. Do not include contingencies in the quantity calculation for plan quantity pay items. The designer is responsible for the final pay quantity for all plan quantity items.

#### **123.4.1.2 Final Measurement Concept**

The designer is responsible to estimate a quantity for all final measure items. Because there are many variables associated with these items, the final pay quantity will be determined by measurements performed in the field when the item is being used or constructed.

### **123.4.2 Breakdown of Quantities**

Pay item quantities are loaded into the Designer Interface system by category, to reflect the work shown in each design group. When incidental work from one design group is included in the component plans for another group, the pay items must continue to be loaded in the appropriate category for the work to be completed. When a contract contains more than one Financial Project ID, pay item quantities for each project are loaded separately; the plan summary boxes for each project should clearly distinguish the location for each item of work. Similarly, the plan tabulation sheets must show separate quantities for each project. Only the Summary of Pay Items run from the AASHTOWare Project™ WebGate Reporting menu (formerly Trns•port reports menu) will show the

project totals, as well as the combined proposal/contract total. Additional information is available in **Chapter 9** of the [Basis of Estimates Manual](#).

### **123.4.3 Participating and Non-participating Pay Items**

When multiple funding sources are available for a single project (federal, state, or local funds), an additional breakdown of pay item quantities may be necessary to identify those pay items or quantities that will “participate” in the available funding. For projects with federal funds, most of the pay items are eligible to “participate” for federal funds. Federal funds are not eligible for use on routine maintenance activities; e.g., mowing, litter removal, but may be used for preventative maintenance (i.e., extending the useful life of a highway.)

Refer to **Chapter 9** of the [Basis of Estimates Manual](#) for more information on loading pay items with multiple funding sources. Note that with multiple funding sources, the method of presenting this information in the plans must be of sufficient detail for project personnel to readily distinguish between participating and nonparticipating work, including its physical location on the project. Project personnel must be able to properly account for the necessary separation of quantities.

For Lump Sum or projects without federal funds, most items will “participate” in the available funding source(s). Unless otherwise directed by the Federal Aid or Work Program Office, all items of work (not including the initial contingency item) will default to participate in the available funding source.

### **123.4.4 Utility Work by Highway Contractor Agreement Plans**

When separate plans for utility construction are to be included in the contract, special attention should be given to establishment of pay items and loading the projects into Designer Interface. Refer to the [Work Program Instructions](#), **Section 42** for guidance on the Financial Project ID phase number identification.

For contracts with more than one project, the pay items for Mobilization and Maintenance of Traffic will be shown on each project’s Summary of Pay Items. An exception to this is when the contract contains a Utility Work by Highway Contractor (UWHC) Agreement. The pay items for Mobilization and Maintenance of Traffic will not be shown on the Summary of Pay Items for the UWHC Agreement. The cost of these items will be included in the lead project.

### 123.4.5 Pay Item Notes

Pay item notes are to be used to clarify basis of quantity, work included or method for payment. Pay item notes should not restate the [Standard Specifications](#) or [Standard Plans](#). This will help to avoid discrepancy of documents. Refer to **FDM 307** for details on the usage of pay item notes in the plans.

Modification for Non-Conventional Projects:
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Delete <b>FDM 123.4</b> .
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### 123.5 Contract Time

Contract duration is the time required for the complete construction of the contract. Pay items measured per day need an accurate estimate of construction duration. Before completion of the design project, the plans package is submitted to the District Construction Office scheduling engineer for establishing the contract duration. Large complex projects should have the desired contract duration established earlier in the design process.

Modification for Non-Conventional Projects:
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Delete <b>FDM 123.5</b> .
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### 123.6 Alternative Contracting Practices

The Construction Office web page defines various contracting techniques used by the Department (<http://www.fdot.gov/construction/AltContract/AltContract.shtm>). When alternative contracting is called for by the Department, coordinate the PS&E preparation with the FDOT Project Manager.

Modification for Non-Conventional Projects:

Delete the previous paragraph and replace with the following:

The Construction Office web page defines various contracting techniques used by the Department (<http://www.fdot.gov/construction/AltContract/AltContract.shtm>). When design-build contracting method is called for by the Department, coordinate the estimate preparation with the FDOT Project Manager.



## 124 Quality Assurance and Quality Control

### 124.1 General

Quality Assurance and Quality Control are two processes used to ensure the public receives a quality product. Quality Assurance is the responsibility of, and performed by the Central Office. Quality Control is a responsibility of the District Offices, and is performed by the Districts and their Agents (Consultants), as appropriate.

Modification for Non-Conventional Projects:

Delete **FDM 124.1** and insert the following:

### 124.1 General

See the RFP for Quality Management Plan (QMP) requirements which describes the Quality Control (QC) procedures to be utilized to verify, independently check, and review all design drawings, specifications, and other contract documents. The QMP must establish a Quality Assurance (QA) program to confirm that the Quality Control procedures are followed. In addition to the QMP all Category 2 Bridge Designs must be verified by an Independent Peer Review. See RFP for requirements.

The Department reserves the right to conduct an audit of the Design Build Firm's QMP process to ensure the submitted plan for the project is being properly executed. Similarly, the Department reserves the right to conduct an audit of the Independent Peer Review to ensure that independent verification of the design and plans is being properly executed. All documentation for QA/QC and independent peer review (e.g., check prints, design calculations) must be kept on file until construction of the project is complete at a minimum.

## **124.2 Quality Assurance**

Quality Assurance is the planned, coordinated and continued activities performed to measure processes against predetermined critical requirements. The objective of Quality Assurance is the continual improvement of the total delivery process to enhance quality, productivity and user satisfaction.

### **124.2.1 Authority**

**Section 20.23(4)(a), Florida Statutes (F.S.)** requires a Quality Assurance Process. It requires the Central Office to establish departmental policies, rules, procedures and standards and to monitor the implementation in order to ensure uniform compliance and quality performance by the District and Central Office units that implement transportation programs. Also, **Section 334.048, F.S.** states the Legislative intent with respect to the Central Office role in the Department's management accountability and monitoring systems, including corrective actions when appropriate.

### **124.2.2 Accountability**

The State Roadway Design monitoring plan identifies the process, critical areas, criteria used to measure compliance, report format, method of monitoring and tracking, and procedure for follow-up of unresolved issues. The results of the Quality Assurance monitoring activities are reported to management in exit interviews and reports. The reports identify areas needing improvement, provide feedback on the effectiveness and appropriateness of established policies, procedures and standards, and recognize areas of outstanding quality. The reports are also used to share improvement ideas between districts, and to maintain consistency in process and practice.

The Central Office must furnish all the planned and systematic actions necessary to provide adequate direction to the Districts so that all design products will be the result of predetermined requirements. This involves the establishment of design policies, procedures, standards and guidelines, training, and the monitoring and review of District compliance with these items.

The Central Office must review each design process and its associated components for assurance that the Districts have adequate control measures in place and are complying with policy, procedures, standards, guidelines and processes. The Central Office review will also identify areas of excellence, noncompliance, and need.

### **124.2.3 Critical Areas to be Monitored**

Critical areas to be monitored by the Central Office are based on well-established roadway design policy and practice. These policies, guidelines and accepted practices formulate the criteria used to measure compliance in the areas critical to quality. The minimum frequency of review for a critical area is three years; however, latitude is allowed for the depth and frequency of reviews, based on the individual District's observed performance, review findings or the needs of District management.

The State Roadway Design monitoring plan for Quality Assurance lists the following critical areas to be monitored.

- (1) Initial Engineering Design Process (See **FDM 110**)
  - (a) Quality Control Activities,
  - (b) Scope Activities,
  - (c) Standards Activities,
  - (d) Design Support Activities,
  - (e) Project Activities.
- (2) Final Engineering Design Process (See **FDM 111**)
  - (a) Quality Control Activities,
  - (b) Review Initial Engineering Design Activities,
  - (c) Engineering Activities,
  - (d) Support Activities.
- (3) Update Engineering Design Process (See **FDM 112**)
  - (a) Quality Control Activities,
  - (b) Scope Activities,
  - (c) Standards Activities,
  - (d) Engineering Activities,
  - (e) Support Activities.

## **124.2.4 Documentation**

The Quality Assurance findings and recommendations will be documented in a report that will be distributed to the District Secretaries and other affected offices. A brief summary of the data will also be entered in the Quality Assurance Reporting (QAR) database. Summaries of significant issues will be prepared quarterly for upper management.

## **124.2.5 Training**

Training and assistance are also a mandated role of the Central Office units and the Quality Assurance program.

(1) Development:

The Central Office Roadway Design will formulate a training plan based upon District requests or needs as determined by the Quality Assurance reviews.

(2) Delivery:

The Central Office will manage or conduct training courses for District and Consultant personnel as requested, with schedules and locations sensitive to budgets and production schedules.

## **124.3 Quality Control**

Quality Control is the process performed to ensure conformance with valid requirements. This process includes quality planning, training, providing clear decisions and directions, constant supervision, immediate review of completed activities for accuracy and completeness, and documenting all decisions, assumptions and recommendations.

Each District must have a District Quality Control Plan for Roadway Design and the other production units, which addresses broad overall quality initiative. The District Quality Control Plan must identify the organization, responsibility, and accountability used to perform and document overall quality control, including the requirement for a Project Quality Control Plan on all projects. All Project Quality Control Plans must address any project specific scope of service needs and be approved by the Department Project Manager or District Design Engineer as appropriate.

In-house and consultant designers and reviewers must recognize quality is the result of several processes. It requires many individuals performing many appropriate activities at the right time during the plans development process. Quality control does not solely consist of a review after a product is completed. Quality requires performing all activities in

conformance with valid requirements, no matter how large or small their overall contribution to the design process. Good CADD techniques, attention to details and ensuring the plans are correct and useful to the contractor are also essential to quality.

### **124.3.1 Authority**

**Section 334.048, F.S.** requires a Quality Control Process. It requires that each District must be accountable for ensuring their District's quality of performance and compliance with all laws, rules, policies, and procedures related to the operation of the department.

### **124.3.2 Accountability**

- (1) The District must follow established design policies, procedures, standards and guidelines in the review and preparation of all design products; and review Consultant prepared individual engineering and design for compliance and good engineering practice.
- (2) The Consultant is an agent for the District with the primary responsibility for preparation of contract plans. Consultants must ensure quality and adherence to established design policies, procedures, standards and guidelines in the review and preparation of all design products for compliance and good engineering practice as directed by the District Project Quality Control Plan.

### **124.3.3 Critical Areas to be Monitored**

The District must monitor the Quality Control efforts used by in-house and Consultant staff. The District must assure project scopes include an adequate Project Quality Control Plan.

### **124.3.4 Documentation**

The Districts must maintain a file containing the current District Quality Control Plan and furnish Central Office Design with a copy to be used as part of the critical areas to be reviewed. Every project file will contain a Project Quality Control Plan at the beginning of the Initial Engineering Design Process.

### **124.3.5 Training**

The District must identify and coordinate the training needs of in-house and Consultant staff through the appropriate Central Office units.

## 125 Federal-Aid Project Certification

### 125.1 General

The Florida Department of Transportation (FDOT) has a [Stewardship and Oversight Agreement](#) with the Federal Highway Administration (FHWA) setting forth the respective roles, responsibilities, and accountability of FDOT and FHWA in the administration of Federal-aid highway funds. See [FHWA-FDOT Stewardship and Oversight Agreement, Topic No. 700-000-005](#) and [Title 23 United States Code 106 \(23 USC 106\)](#). Under this agreement, FHWA grants to FDOT general responsibilities and approvals for design, plans, specifications, estimates, contract awards, contract administration, and project inspections on Federal-aid highway projects except for those projects FHWA and FDOT used the risk-based approach to select as projects of Division Interest” (PoDI), and as discussed in **FDM 125.2**. For those projects that FDOT has oversight responsibility, FDOT will act on FHWA’s behalf by complying with all applicable FHWA policies, regulations, **Title 23 USC**, and **non-Title 23 USC** requirements. Notwithstanding this, FHWA may become involved with any Federal-aid project and retains overall responsibility for all aspects of Federal-aid programs. As such, FHWA has full access to and the legal authority to review any aspect or record of any Federal-aid project at any time. In accordance with **Title 2 Code of Federal Regulations Part 200 (2 CFR Part 200)**, records will be retained for a minimum of three years or until litigation, claims or audit findings initiated before the three-year period have been resolved.

Modification for Non-Conventional Projects:

Delete the second sentence of the above paragraph and replace with the following:

See [FHWA-FDOT Stewardship and Oversight Agreement, Topic No. 700-000-005, Title 23 United States Code 106 \(23 USC 106\)](#), and [Title 23 Code of Federal Regulations 636 \(23 CFR 636\)](#).

## 125.2 Selection of Federal-Aid Projects

In accordance with the Stewardship and Oversight Agreement, annually in July, FHWA and FDOT will use risk-based approach to negotiate which new projects will be selected as Projects of Division Interest (PoDI). The FHWA Transportation Engineer will coordinate the project selection with their assigned FDOT District Office. Ideally, the projects will be selected from projects listed in the Statewide Transportation Improvement Program (STIP) to be approved by FHWA the following October 1<sup>st</sup>, and will include projects selected from all four years of the STIP. The projects selected should be on the Federal-aid system to primarily include the Interstate and National Highway System (NHS) routes, but non-NHS projects can be selected. The projects should be selected considering the factors below:

- (1) All major projects as defined by FHWA's major project criteria (cost  $\geq$  \$500 million)
- (2) Controversial and Congressional interest Projects
- (3) Demonstration (demo) and pilot projects
- (4) Interstate projects:
  - (a) With Design Exceptions to the 10 controlling criteria
  - (b) For new or modified access points
  - (c) For major reconstruction and widening
- (5) Projects utilizing innovative contracting methods; e.g., design build, public-private partnerships.
- (6) Special Experimental Projects (SEP):
  - (a) Projects requiring SEP-14 approval for alternative contracting methods
  - (b) Projects requiring SEP-15 approval for public-private partnerships
- (7) Unusually complex or controversial projects
- (8) Major unique and/or unusual structures
- (9) A priority focus for projects on the NHS
- (10) A desire to have a mix in project size and scope

All federally funded projects must comply with applicable ***non-Title 23 U.S.C.*** requirements which include, but are not limited to:

- (1) National Environmental Policy Act (NEPA) of 1969 pursuant to 40 C.F.R. Parts 1500 - 1508, 23 C.F.R. Section 771 and Section 6002 of SAFETEA-LU
- (2) Section 4 (f) of the DOT Act of 1966
- (3) Clean Air Act Amendments of 1990
- (4) Civil Rights Act of 1964
- (5) Civil Rights approvals
- (6) Disadvantaged Business Enterprise Program (DBE)
- (7) Uniform Relocation Assistance and Real Properties Acquisition Policies Act of 1970
- (8) Hardship acquisition and protecting buying
- (9) Americans with Disabilities Act/Section 504 Rehabilitation Act of 1973
- (10) Davis-Bacon wage rates
- (11) Waiver for Buy America requirements
- (12) SEP-14/SEP15 contracting methods
- (13) Executive Orders
- (14) FHWA Guidance and technical advisories
- (15) Addition/modification of access points to the Interstate (Interchange, locked gate access points, median crossovers for construction)
- (16) Project by project obligation of federal funds
- (17) Modifications to Federal-aid project agreements
- (18) Final Vouchers



### 125.3 FDOT Responsibilities

The final design documents, reports and plans for projects not selected as PoDI will be developed in accordance with all applicable Department manuals, guidelines and procedures, and in compliance with all applicable Federal Statutes, Regulations, Executive Orders, and FHWA Directives and Standards. The Department is responsible for assuring that all appropriate criteria have been adhered to, and for documenting its findings in lieu of FHWA reviews. Several of the major areas and the method to be used by the Department to document the acceptability of various final design activities in place of an FHWA review and approval are:

(1) Typical Section Package:

The typical section package should be prepared as described in **FDM 120.2.3** and **120.3.2**. Concurrence by the District Design Engineer documents the acceptability of the package. Concurrence from the District Structures Design Engineer may also be required on unusual bridge typical sections.

(2) Pavement Design Package:

The pavement design is developed and approved by the responsible professional engineer in accordance with Department pavement design procedures. Concurrence from the District Design Engineer is required to document the acceptability of the package in lieu of FHWA review and concurrence.

(3) Bridge Hydraulics Report:

The hydraulics report is developed and approved by the responsible professional engineer in accordance with appropriate design standards. Concurrence from the District Drainage Engineer is required to document the acceptability of the package in lieu of FHWA review and concurrence.

(4) Bridge Development Report:

The bridge development report is developed and approved by the responsible professional engineer in accordance with appropriate design standards. Concurrence from the District Design, Structures Design, or Project Management Engineer is required to document the acceptability of the report in lieu of FHWA review and concurrence.

Modification for Non-Conventional Projects:
Delete item (4).

(5) Design Plans Phase Reviews:

Plan reviews should be conducted as described in **FDM 120**. Concurrence in the resolution of phase review comments from the District Design, Structures Design, or Project Management Engineer is required to document the acceptability of the reviews in lieu of FHWA review and concurrence. (See **Form 125-A, in FDM 103**)

Modification for Non-Conventional Projects:

Delete the above paragraph and replace with the following:

Plan reviews will be conducted as described in **FDM 301**. (See **Form 125-B, in FDM 103**)

(6) Design Exceptions:

Design Exceptions on projects not selected as PoDI require approval and concurrence as described in **FDM 122**.

(7) Special Provisions:

Special provisions, which include project specific and technical special provisions, will be developed and approved by the responsible professional engineer. Concurrence from the District Specifications Engineer is required to document the acceptability of the special provisions in lieu of FHWA review and concurrence. (See **Form 125-C, in FDM 103**)

(8) Plans, Specifications, and Estimates:

The Plans, Specifications, and Estimates (PS&E) Package and contract file will be transmitted to Tallahassee as described in **FDM 131**. The District Director of Transportation Development will certify that the design and PS&E Package has been prepared according to the appropriate certification procedures. The date of this certification will be noted on the Transmittal of PS&E Package. The Transmittal will also identify the individuals that reviewed the Plans Package, Specification Package, and Authorization Estimate, and the dates of their respective reviews. The Department's official estimate will be approved by the District Estimates Engineer.

Modification for Non-Conventional Projects:

Delete Item 8.

(9) Authorization to Advertise:

The PS&E Package must be approved by the Specifications and Estimates Office prior to requesting FHWA authorization for construction to advertise. The Contract File Package (consisting of the documents listed on the Contract File Index completed by the district), FHWA Summary Sheet, Cost Estimate, Right of Way Certification, Utility Certification, Environmental Certification and Railroad Certification Agreement (if applicable), along with confirmation of the PS&E approval will be reviewed by the appropriate district and central offices and by the Federal Aid Management Office prior to submittal of the federal authorization request.

Modification for Non-Conventional Projects:

Delete Item 9 and replace with the following:

(9) Use of Federal Funds on Design-Build Projects

The District Design-Build team approves the Design Criteria Package before the release of the **Final Request for Proposal** to the Design-Build Firms. The Design-Build authorization request should be processed immediately upon notice of receipt of package approval. Upon receipt of the approved FHWA authorization, District Federal-Aid Coordinators should notify the District Design-Build firm so that the RFPs and Design Criteria packages can be distributed. See **Chapter 7.1** of the [Design Build Procurement and Administration](#) procedure.

(10) Revisions:

Revisions to the PS&E Package will be processed as described in **FDM 131**. Concurrence from the District Design, Structures Design, or Project Management Engineer is required to document the acceptability of the revision in lieu of FHWA review and concurrence.

Modification for Non-Conventional Projects:

Delete Item 10.

In special cases where programs or projects are developed in the Central Office, an appropriate Central Office Manager will provide any necessary concurrences in lieu of a District Manager. **Figure 125.5.1** outlines the approval and concurrence process.

Modification for Non-Conventional Projects:

Delete the above paragraph.

(11) Environmental Review

Pursuant to ***Title 23 U.S.C., Chapter 3, Section 327 and the Memorandum of Understanding (MOU)*** executed on December 14, 2016, the Department had assumed FHWA's responsibilities under the National Environmental Policy Act (NEPA) for highway projects on the State Highway System (SHS) and Local Agency Program (LAP) projects off the SHS. Based on this MOU, the Department responsibilities include environmental review, interagency consultation, and other activities pertaining to the review or approval of NEPA actions. The Department is the Lead Federal Agency for highway projects, and approval authority is held by the State Office of Environmental Management. (OEM).

## 125.4 Certification Documentation and Reviews

FHWA will perform periodic reviews of projects developed under the Stewardship and Oversight Agreement and may have access to review project phases and records at any time. Adequate documentation throughout the design phase is critical. All approvals and concurrences outlined in the previous section must be sufficiently documented. A complete, well-organized design project file should be able to support a compliance review. All correspondence and documents must include the Federal-aid project number. The Quality Assurance procedures described in ***FDM 124*** will be used by the Central Office to monitor district compliance with the certification requirements.

Modification for Non-Conventional Projects:

Delete the last sentence in the above paragraph.

## 125.5 Certification Statement

A Federal-aid project certification statement by the District Director of Transportation Development for each project is no longer required; however, Districts are responsible for ensuring that all Federal-aid requirements are met as described in this chapter.

**Figure 125.5.1 Approval and Concurrence Process**

<p align="center"><b>TYPICAL SECTION PACKAGE</b></p> <p>Approved: 6                  Concurrence: 3 or 4                  (FDM 120.2.3)</p>	<p align="center"><b>PAVEMENT DESIGN PACKAGE</b></p> <p>Approved: 6                  Concurrence: 3                  (Pavement Design Manual)</p>		
<p align="center"><b>BRIDGE DEVELOPMENT REPORT</b></p> <p>Approved: 6                  Concurrence: 3 4 5 or 7                  (FDM 121)</p>	<p align="center"><b>APPROVAL OF PHASE REVIEW PLANS (Roadway and Structures)</b></p> <p>Approved: 6                  Concurrence: 3 4 5 7 or District Roadway Design Engineer                  (FDM 120)</p>		
<p align="center"><b>CRASH/SAFETY REVIEW</b></p> <p>Approved: District Safety Engineer</p>	<p align="center"><b>SPECIAL PROVISIONS</b></p> <p>Approved: 6                  Concurrence: 9</p>		
<p align="center"><b>DESIGN CRITERIA</b></p> <p>DESIGN EXCEPTIONS                  Requested: 3 or 6                  Concurrence: 8, and 7 when needed.                  Approved: FHWA or 11                  (FDM 122)</p>	<p align="center"><b>BRIDGE HYDRAULICS REPORT</b></p> <p>Approved: 6                  Concurrence: District Drainage Engineer                  (Drainage Manual, Chap. 4)</p>		
<p align="center"><b>PLANS, SPECIFICATIONS AND ESTIMATES</b></p> <p>PLANS PACKAGE                  Approved: 2</p> <p>SPECIFICATIONS PACKAGE                  Approved: 9</p> <p>FHWA AUTHORIZATION ESTIMATE                  Approved: 10                  (FDM 131.3)</p>	<p align="center"><b>REVISIONS TO PS&amp;E</b></p> <p>Approved: 6                  Concurrence: 3 4 or 5                  (FDM 131.4)</p> <hr/> <p align="center"><b>ASSEMBLY OF PS&amp;E &amp; CERTIFICATION OF OTHER REPORTS AS REQUIRED</b></p> <p>Responsibility: FA Manager</p>		
<table border="0"> <tr> <td style="vertical-align: top;"> <ol style="list-style-type: none"> <li>1 District Secretary</li> <li>2 District Director of Transportation Development</li> <li>3 District Design Engineer</li> <li>4 District Structures Design Engineer</li> <li>5 District Project Management Engineer</li> <li>6 Responsible Professional Engineer</li> <li>7 State Structures Design Engineer</li> <li>8 State Roadway Design Engineer</li> <li>9 District Specifications Engineer</li> <li>10 District Estimates Engineer</li> <li>11 State Director of Design (for exempt projects)</li> </ol> </td> <td style="vertical-align: top; padding-left: 20px;"> <p><b>NOTE:</b>                      In special cases where programs or projects are developed in the Central Office, an appropriate Central Office Manager will provide concurrence in lieu of the District Manager.</p> </td> </tr> </table>		<ol style="list-style-type: none"> <li>1 District Secretary</li> <li>2 District Director of Transportation Development</li> <li>3 District Design Engineer</li> <li>4 District Structures Design Engineer</li> <li>5 District Project Management Engineer</li> <li>6 Responsible Professional Engineer</li> <li>7 State Structures Design Engineer</li> <li>8 State Roadway Design Engineer</li> <li>9 District Specifications Engineer</li> <li>10 District Estimates Engineer</li> <li>11 State Director of Design (for exempt projects)</li> </ol>	<p><b>NOTE:</b>                      In special cases where programs or projects are developed in the Central Office, an appropriate Central Office Manager will provide concurrence in lieu of the District Manager.</p>
<ol style="list-style-type: none"> <li>1 District Secretary</li> <li>2 District Director of Transportation Development</li> <li>3 District Design Engineer</li> <li>4 District Structures Design Engineer</li> <li>5 District Project Management Engineer</li> <li>6 Responsible Professional Engineer</li> <li>7 State Structures Design Engineer</li> <li>8 State Roadway Design Engineer</li> <li>9 District Specifications Engineer</li> <li>10 District Estimates Engineer</li> <li>11 State Director of Design (for exempt projects)</li> </ol>	<p><b>NOTE:</b>                      In special cases where programs or projects are developed in the Central Office, an appropriate Central Office Manager will provide concurrence in lieu of the District Manager.</p>		

Modification for Non-Conventional Projects:	
Delete <b>Figure 125.5.1</b> and replace with the following:	
<b>Figure 125.5.1 Approval and Concurrence Process</b>	
<b>TYPICAL SECTION PACKAGE</b>	<b>PAVEMENT DESIGN PACKAGE</b>
Approved: 6 Concurrence: 3 or 4 ( <i>FDM 120.2.3</i> )	Approved: 6 Concurrence: 3 ( <i>Pavement Design Manual</i> )
<b>APPROVAL OF PHASE REVIEW PLANS (Roadway and Structures)</b>	<b>BRIDGE HYDRAULICS REPORT</b>
Approved: 6 Concurrence: 3 4 5 7 or District Roadway Design Engineer ( <i>FDM 301</i> )	Approved: 6 Concurrence: District Drainage Engineer ( <i>Drainage Manual, Chap. 4</i> )
<b>CRASH/SAFETY REVIEW</b>	<b>SPECIAL PROVISIONS</b>
Approved: District Safety Engineer	Approved: 6 Concurrence: 9
<b>DESIGN CRITERIA</b>	<b>PLANS, SPECIFICATIONS AND ESTIMATE</b>
DESIGN EXCEPTIONS Requested: 3 or 6 Concurrence: 8, and 7 when needed. Approved: FHWA or 11  ( <i>FDM 122</i> )	PLANS PACKAGE Approved: 2  SPECIFICATIONS PACKAGE Approved: 9  FHWA AUTHORIZATION ESTIMATE Approved: 10  ( <i>FDM 131.3</i> )
<ol style="list-style-type: none"> <li>1 District Secretary</li> <li>2 District Director of Transportation Development</li> <li>3 District Design Engineer</li> <li>4 District Structures Design Engineer</li> <li>5 District Project Management Engineer</li> <li>6 Responsible Professional Engineer</li> <li>7 State Structures Design Engineer</li> <li>8 State Roadway Design Engineer</li> <li>9 District Specifications Engineer</li> <li>10 District Estimates Engineer</li> <li>11 State Director of Design (for exempt projects)</li> </ol>	<p><b>NOTE:</b>                  In special cases where programs or projects are developed in the Central Office, an appropriate Central Office Manager will provide concurrence in lieu of the District Manager.</p>

## 126 Lane Elimination Projects

Modification for Non-Conventional Projects:

Delete **FDM 126**.

### 126.1 General

Lane elimination projects (a.k.a., “road diets”) are intended to reconfigure the existing cross section to allow other uses. These projects typically provide more livable environments, and contribute to economic development and vitality to a community. The recovered travel way can be used to accommodate other purposes (e.g., bicycle lanes, wider sidewalks, landscaping, on-street parking, bulb-outs).

A local governmental entity (e.g., municipality, county, MPO, TPO) or the Department can submit a request for the elimination of travel lanes on the State Highway System (SHS). A private entity may only submit a request through a local governmental entity.

### 126.2 Requirements

Comply with AASHTO and Department design criteria when considering a lane elimination project. A Design Exception or Design Variation is required when a proposed design element is below the governing criteria. See **FDM 122** for information on Design Exceptions and Design Variations.

Analyze the impacts that a lane elimination project may have in different areas, such as:

- utilities
- access management
- businesses
- traffic operation and safety
- pedestrian and bicyclist activity
- transit and freight routes
- environmental impacts

Since a lane elimination project may redistribute traffic to other transportation facilities, environmental and traffic impacts to those corridors must also be evaluated.

Guidance on the development and review processes for eliminating lanes on the SHS is provided in the Department’s **Statewide Lane Elimination Guidance** ([Phase 1](#) and [Phase 2](#)).

## **126.2.1 Federal-Aid Projects**

Follow the National Environmental Policy Act (NEPA) for lane elimination projects that use federal funding.

## **126.2.2 Roadway Reclassification**

A lane elimination project can potentially change the functional classification of a roadway, which could affect planning, funding eligibility, traffic analyses, project prioritization, and state and federal reporting requirements.

A request for a change in functional classification requires review and approval by the Department and FHWA. Approval is typically requested during the preliminary review process as detailed in **FDM 126.3**.

A proposed change in functional classification of a roadway on the National Highway System (NHS) requires coordination between the Department, local officials, and FHWA.

## **126.3 Application Process**

There are two steps in the application process:

- Preliminary Review
- Final Review and Approval

### **126.3.1 Preliminary Review**

The Preliminary Review process is as follows:

- (1) The applicant submits the lane elimination request to the District Lane Elimination Coordinator.
- (2) The applicant completes and submits the Initial Meeting Checklist (see **Form 126-A**.)
- (3) The District Lane Elimination Coordinator schedules the initial meeting to discuss the proposed lane elimination project with the District Review Team. The applicant will attend the initial meeting to discuss the process and requirements of the lane elimination request. The District Lane Elimination Coordinator submits the initial notification to Central Office Systems Planning Office. This will include:
  - (a) Initial Checklist (**Form 126-A**)



- (b) Methodology Checklist (**Form 126-B**)
- (c) Meeting Minutes
- (d) Initial Notice to Central Office (**Form 126-C**), with concurrence from the District Design Engineer and District Traffic Operations Engineer.

### **126.3.2 Final Review and Approval**

The Final Review and Approval process is as follows:

- (1) The District Lane Elimination Coordinator submits the Final Review and Approval Notice to Central Office (**Form 126-D**), signed by the District Design Engineer and District Traffic Operations Engineer, to the Central Office Systems Planning Office.
- (2) The Systems Planning Office will be responsible for coordinating the review of the lane elimination request by the different offices in Central Office (e.g., Design, Traffic Operations) and obtain concurrence from the Chief Planner.
- (3) The Systems Planning Office will submit the lane elimination request for obtaining the final approval or denial by the Chief Engineer. The Chief Engineer has the final authority to approve or deny the lane elimination request.

## 127 Community Aesthetic Features

### 127.1 General

A Community Aesthetic Feature (CAF) is an enhancement installed within the Department's right of way to represent or reflect the surrounding community's identity, culture, and values. A CAF may also enhance the sense of place through which a highway passes.

A CAF placed within FDOT right of way (R/W), or attached to an FDOT structure or facility must be approved by the Department. These features are designed, maintained, and paid for by a local governmental agency. A CAF is typically constructed by the sponsoring entity, but may be included as part of a Department project.

The [Community Aesthetic Feature Agreement](#) (**Form Number 625-010-10**) must be executed by the local governmental entity and the Department prior to any construction within the Department's R/W. This agreement provides for the removal and/or relocation of the CAF at the local governmental entity's expense should it not be maintained by the local governmental entity, or if the Department needs the R/W for transportation purposes. A Deposit, Performance Bond, or Letter of Credit is required as part of the [Community Aesthetic Feature Agreement](#). A waiver of the Deposit, Performance Bond or Letter of Credit is allowed for certain minor installations as indicated within the CAF agreement.

See **F.S. 334.187** for Bond and Letter of Credit requirements.

Final plans for placing a CAF within the Department's R/W must be accompanied by a resolution of the local governmental entity indicating their full financial responsibility for the feature's design, construction and maintenance during its lifespan.

### 127.2 Requirements

A CAF must meet the Department's requirements governing safety, access, and maintenance of the highway. A CAF is classified in the following categories:

- (1) Public Art (Stand Alone or Affixed)
- (2) Local ID Markers (Stand Alone or Affixed)

While there are some criteria unique to each category, all CAFs must meet the following requirements:

- (1) Except where parking is available, select a site and lay out the site plan to deter drivers from stopping within the roadway. If drivers are expected to stop or park, provide for parking in the plan. If public access is available, Department Standards and Specifications must be met, including ADA requirements. Prohibit public access to the CAF when located within limited access R/W.
- (2) The feature must not contain any signs as defined in the **2009 Manual on Uniform Traffic Control Devices (MUTCD), Part 1, Chapter 1A.13**, traffic control features, auditory devices, reflective surfaces, flashing lights, moving parts or moving illumination.
- (3) The feature must not contain any advertising per the **MUTCD** and **23 C.F.R., 1.23** which prohibits advertising on, or commercial use of the R/W. Commercial advertising on state R/W is also prohibited by **Chapter 479, Florida Statutes**, including charitable, fraternal, religious, or political signs, symbols, logos, banners, web links, or any other such devices.
- (4) Lighting of the feature must not be directed at motorists, bicyclists or pedestrians. For lighting criteria see **FDM 231**. When located near an airport, the feature must not create a hazard as defined by **Section 333.01(3), F.S.**
- (5) In absence of feature lighting, messages or text included on Local ID Markers must be retroreflective. Decorative or accent lighting must not include any strobe effects, flashing lights, moving parts, or moving illumination.
- (6) Local ID Markers (Stand-Alone or Affixed) are not allowed on limited access facilities unless they are part of an overall aesthetic treatment plan that can include landscaping and other aesthetic components.
- (7) Local ID Markers intended to represent the geographic boundary of the county, municipality, sovereign nation, or unincorporated area should be located in close proximity to the actual geographic boundary of that area. Remove existing standard geographic boundary guide signs, and/or non-official signs or structures, at or near the location.
- (8) Do not install Local ID Markers in both the median and roadside at a given location.
- (9) CAF installations involving the Interstate System, which are visible from the Interstate mainline, require FHWA approval.
- (10) CAFs within the median of a limited access facility are prohibited.
- (11) One Stand-Alone feature will be allowed per mainline interchange approach (for a maximum of two installations). The local governmental entity must select one site from amongst the ramp and the mainline, along the outside of a ramp, or the area inside a loop ramp.

- (12) The feature must meet applicable building codes and design criteria for similar structures or landscaping placed adjacent to the highway's R/W, including wind loading commensurate with highway signs in the area.
- (13) The feature must not cause adverse impacts or create public controversy related to any of the following:
  - (a) Property access
  - (b) Air quality
  - (c) Noise
  - (d) Water quality
  - (e) Wetlands
  - (f) Floodplain encroachments
  - (g) Imperiled, endangered or threatened species or their critical
  - (h) Habitat historical resources
- (14) The CAF, including amenities like landscape or fencing, must not obstruct signs or interfere with a sight distance, sight triangle, or permitted view zone (billboards).
- (15) The CAF final design must be signed and sealed by a responsible professional licensed in Florida, excluding art wraps.

### **127.2.1 Public Art (Stand-Alone)**

Additional requirements for Public Art (Stand-Alone) are as follows:

- (1) All roadways
  - (a) The location must be outside the appropriate lateral offset or clear zone as defined in **FDM Table 215.2.3** and **Table 215.2.4**, and should be as close to the right of way line as practical.
  - (b) The structure may not display messages with text, or contain any words or alpha-numeric characters.
  - (c) The artist's insignia may be inscribed or etched on a small plaque affixed to the artwork, or placed on the artwork itself. The insignia must not be visible from the roadway so as to avoid distraction to drivers or bicyclists.
  - (d) The object's highest point must not be greater in elevation than 25 feet above the nearest point of the roadway.
- (2) Curbed roadways

The feature may be placed within the median of curbed roadways, where:

- (a) The Design Speed is less than or equal to 45 mph, and
- (b) R/W is restricted, and
- (c) A minimum 4-foot offset from the face of curb is provided.

### **127.2.2 Public Art (Affixed)**

Additional requirements for Public Art (Affixed) are as follows:

- (1) The feature may not display any messages with text, or contain any words or alpha-numeric characters.
- (2) The artist's insignia may be inscribed or etched on a small plaque affixed to the artwork, or placed on the artwork itself. The insignia must not be visible from the roadway so as to avoid distraction to drivers or bicyclists.
- (3) For bridges, the feature must not reduce the vertical clearance over the roadway.
- (4) For art wraps affixed to roadside features:
  - (a) Do not obstruct traffic control cabinet vents with the art wrap.
  - (b) The DDE should coordinate with the District Traffic Operations Office during the review process for traffic control cabinet wraps.
  - (c) Art wrap themes can be approved for general use by a local government entity.
  - (d) A CAF Agreement will be required for these features.
  - (e) Any maintaining agency, other than a local government, must coordinate approvals and maintenance through the appropriate local government entity.
  - (f) Logos representing the local governmental entity are permitted.
  - (g) A Deposit, Bond, or Letter of Credit is not required for art wraps on traffic control cabinets.

### **127.2.3 Local ID Marker (Stand-Alone)**

Additional requirements for a Local ID Marker (Stand-Alone) are as follows:

- (1) All roadways:

- (a) The location must be outside the appropriate clear zone and lateral offset as defined in **FDM 215.2.3 and 215.2.4** and should be as close to the R/W line as practical.
  - (b) The structure may contain text such as the name of the municipality, county, or community area (as defined in **Chapter 14-51.041, F.A.C.**) with a short phrase or message. Text such as “Exiting” or “Leaving” are prohibited.
  - (c) The object’s highest point must not be greater in elevation than 25 feet above the nearest point of the roadway.
- (2) Curbed roadways:  
The feature may be placed within the median of curbed roadways, where:
- (a) The Design Speed is less than or equal to 45 mph, and
  - (b) R/W is restricted, and
  - (c) A minimum 4-foot offset from the face of curb is provided.
- (3) Limited Access Facilities:
- (a) Provide a minimum 50-foot offset (100-foot preferred) from the edge of the traveled way, whether guardrail is present or not. The 50-foot to 100-foot lateral offset will help to minimize driver distraction, and reduce the likelihood that vertical structures will become storm debris blown across the roadway.
  - (b) Letter height must not exceed four feet.
  - (c) Short phrases or messages are prohibited.

#### **127.2.4 Local ID Marker (Affixed)**

Additional requirements for a Local ID Marker (Affixed) are as follows:

- (1) All roadways:
  - (a) The feature may contain text such as the name of the municipality, county or community area (as defined in **Chapter 14-51.041(2)(c), F.A.C.**) with a short phrase. Text such as “Exiting” or “Leaving” are prohibited.
  - (b) For bridges, the feature must not reduce the vertical clearance over the roadway.
- (2) Limited Access Facilities:
  - (a) Letter height must not exceed four feet.
  - (b) Short phrases or messages are prohibited.

## 127.3 Approval Process

The application process is conducted in two phases, the Concept Phase and the Final Phase.

When any of the requirements in **FDM 127.2** are not met, a Design Variation must be approved by the State Roadway Design Engineer.

### 127.3.1 Concept Phase

The Concept Phase includes District coordination with the applicant to ensure:

- (1) The appropriate Community Aesthetic Feature category is selected,
- (2) The corresponding requirements are achievable and acceptable, and
- (3) The conditions of the [Community Aesthetic Feature Agreement](#) are acceptable.

The District will submit a concept drawing and documentation to the State Roadway Design Engineer. The concept submittal must include a **Submittal/Approval Letter**, which can be found in **FDM 103, Form 122-A**. The **Submittal/Approval Letter** is to be signed by a representative of the requesting entity and the District Design Engineer or Turnpike Design Engineer.

Upon review by the Roadway Aesthetic Community of Practice (RACoP) and the State Roadway Design Engineer, conceptual approval may be granted. If the concept and proposed Design Variations are deemed acceptable, the signed **Submittal/Approval Letter** indicating Central Office conceptual approval will be returned to the District. Otherwise, conceptual approval will be denied with comments. The conceptual approval is valid for one year, at which time the local governmental entity may request an extension from the District.

For applications involving the Interstate System, the District should coordinate with the FHWA District Transportation Engineer prior to submitting to the Central Office.

The package submitted to the Central Office for conceptual approval must include the following:

- (1) The designation of the feature category.
- (2) A conceptual drawing/rendering showing the top, front, and side views of the feature with labeled dimensions, material designations including connections, proposed lighting configuration, and any alpha-numeric characters.

- (3) A draft site plan and section view dimensioning the location of the feature in relation to the roadway and the R/W.
- (4) The design speed of all adjacent roadways.
- (5) A citation of the Governing Design Standards (or Governing Standard Plans), criteria, and building code to which the feature will be designed.
- (6) If the feature is to be affixed to a bridge:
  - (a) Identify the bridge owner.
  - (b) Declare what the impact is to the bridge loading.
- (7) The Signature/Approval Letter signed by the applicant and the District Design Engineer or Turnpike Design Engineer.

### **127.3.2 Final Phase**

The Final Phase includes the preparation and review of all final documents. The District will submit the **Submittal/Approval Letter** and final documents with a recommendation for approval to the Central Office. The Roadway Aesthetic Community of Practice (RACoP) and the State Roadway Design Engineer will review the application and provide approval to place the feature, or deny the submittal with comments.

The package submitted to the Central Office for final approval must include the following:

- (1) Site Plans, including a Traffic Control Plan if temporary maintenance of traffic will be required to place or maintain the feature.
- (2) Structural Plans including a wind load analysis.
- (3) Local Governmental Entity Resolution.
- (4) Design Variations for any requirements in **FDM 127.2** that are not met.
- (5) **Community Aesthetic Feature Agreement** signed by the local governmental entity.
- (6) **Signature/Approval Letter** signed by the applicant and the District Design Engineer or Turnpike Design Engineer.

Upon receiving Central Office final approval and, if applicable, FHWA, the District will notify the local governmental entity that placement of the feature may proceed. The final approval is valid for one year, at which time the local governmental entity may request an extension from the District.



## **127.4 Place Name Signs**

Customized Place Name Signs are considered Local ID Markers which are addressed in ***FDM 127.2.3 and 127.2.4.***

The placement of Place Name Signs within FDOT R/W is regulated by the Department. Requirements for Place Name Signs within FDOT R/W are located in ***Rule Chapter 14-51, F.A.C., Part IV Place Name Signs.***

All signs placed within the Department's R/W must meet the requirements contained in the [MUTCD, Part 2](#). Signs for general information, services, tourist destinations, and recreational/cultural interest areas all have specific chapters in the [MUTCD](#), which specify color, size and lettering requirements. Destination signs are classified in the [MUTCD](#) as Guide Signs.

## **127.5 Blue Star Memorial Markers and Flag Poles**

Blue Star Memorial Markers and Flag Poles are not considered Community Aesthetic Features and are not covered by this chapter. These markers are managed through the Local FDOT Maintenance and Traffic Operations offices.

## 130 Signing and Sealing Documents

### 130.1 General

The act of signing, dating and sealing transmitted plans, specifications, reports or other documents is collectively referred to as signing and sealing.

This chapter provides the Department's requirements for signing and sealing plans and documents in conformance with **Florida Statutes (F.S.)** and **Florida Administrative Code (F.A.C.)**. The Laws and Rules referenced in this chapter are primarily those governing Professional Engineers. Other licensed professionals that are required to sign and seal plans or documents are to follow the Laws and Rules applicable to their profession.

It is the licensee's responsibility to comply with the signing and sealing requirements applicable to their profession's Laws and Rules. It is the District's responsibility to verify that documents are signed and sealed, and transmitted in accordance with this chapter.

### 130.2 Signing and Sealing Contract Plans

The transmitted contract plans signed and sealed by the responsible professional(s) become the Record Set. Every sheet of the Record Set must be signed and sealed, except for the following sheets that may be appended to the contract plans set:

- Existing Bridge Plans,
- [Developmental Standard Plans](#), and
- Plans that are prepared by an employee of a Utility or other employees exempted under [Section 471.003, F.S.](#), except as follows.
  - Utility plans that modify or detail attachments to a bridge or other structure belonging to the Department must sign and seal the sheets affecting such bridge or structure.
  - Plans prepared by nonexempt parties for a Utility must be signed and sealed.

Every sheet of the Record Set must include a title block that contains information for the professional engineer that will sign and seal the sheet, showing:

- (1) The name, address, and license number of the engineer, or
- (2) If practicing through a duly authorized engineering business, the name and license number of the engineer, and the name, address and certificate of authorization number of the engineering business, or
- (3) If employed by a local, State or Federal agency, the name and license number of the engineer, and the name and address of the agency.

A non-engineering licensed professional that will sign and seal the sheet must show similar information in the title block related to their profession.

### **130.2.1 Digital Signing and Sealing**

Digital Delivery is the standard method of electronically transmitting contract documents to the Department. This includes the creation of Portable Document Format (PDF) files of contract plans and specifications, which are signed and sealed with a Digital Signature. The [CADD Manual](#) defines the type of digital certificate to be used for Digital Signature. A representation of the professional's seal next to the Digital Signature Appearance is required for Contract Plans.

Place the following note along the right edge of plan sheets that are digitally signed and sealed:

“THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE  
DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.”

The rule number referenced in the note above applies to the engineering professional that is signing and sealing the sheet. A non-engineering licensed professional should use the rule number that applies to their profession:

- Surveyors, Rule 5J-17.062, F.A.C.
- Geologists, Rule 61G16-2.005, F.A.C.
- Landscape Architects, Rule 61G10-11.011, F.A.C.
- Architects, Rule 61G1-16.005, F.A.C.

Electronically transmit the Contract Plans as individual signed and sealed PDFs of component plans. The list of component plans for Digital Delivery is comprised of the following:

- (1) Roadway Plans
- (2) Signing and Pavement Marking Plans
- (3) Signalization Plans
- (4) Intelligent Transportation System (ITS) Plans
- (5) Lighting Plans
- (6) Landscape Plans
- (7) Architectural Plans
- (8) Structures Plans
- (9) Toll Facilities Plans

Component plans may require insertion of sheets that were prepared early in, or prior to the design process (“early works”). The following early plan sheets may be contained in a separate signed and sealed PDF that is to be included as part of the Contract Plans:

- CTL-# Project Control
- GR-# Soil Survey and Report of Core Borings
- TR-# Tree Survey
- UTV-# Verified Utility Locate

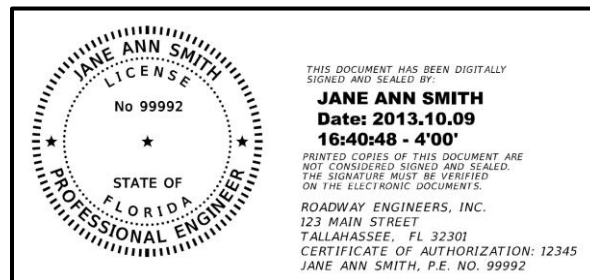
No other plans sheets than those listed above are to be submitted separate from the component plans, except for manually signed and sealed documents as discussed in **FDM 130.2.2**.

See **FDM 302** for instruction on how to show early plan sheets on the Key Sheet.

### **130.2.1.1 Single Digital Signature**

Component plans that will be signed and sealed by a single professional (signatory) may place a signature block, as shown in **Figure 130.2.1**, on the component Key Sheet in lieu of using a Signature Sheet. Listing the sheets contained in the PDF to be signed and sealed is not required.

**Figure 130.2.1      Signature Block**



### **130.2.1.2 Multiple Digital Signatures**

A Signature Sheet is required for component plans that will be signed and sealed by more than one professional. See **FDM 303** for Signature Sheet requirements.

### **130.2.2 Manual Signing and Sealing**

Digital Delivery is the standard practice for signing and sealing, and transmittal of contract documents. Transmittal of contract documents that have been manually signed and sealed is only accepted when Digital Delivery is not possible. The following approval is required for acceptance of manually signed and sealed documents:

- (1) District Plans, Specifications, and Estimates (PS&E) Engineer for District Lettings
- (2) State Final Plans Engineer for Central Office Lettings.

The district is to receive one set of manually signed and sealed contract documents to be retained as the record set. Place a note on the first sheet of the documents and scan into a pdf file. The note is to read: “This is a scanned copy of the original signed and sealed document”. Use the scanned pdf file for the Letting process.

If the scanned pdf are sheets that are to be included with a component of the Contract Plans, follow the process for “early works”, see **FDM 130.2.1**.

The requirements for manually signing and sealing are covered in the Laws and Rules for each licensee’s profession. Do not include the note along the right edge of plan sheets that is used when documents are digitally signed and sealed.

## **130.3 Signing and Sealing Other Documents**

Other documents to be signed and sealed include reports, calculations, specifications and criteria packages, used in the development of design plans. Sign and seal Specifications Packages in accordance with the [Specifications Handbook](#).

### **130.3.1 Digital Signing and Sealing**

Signing and sealing PDF documents with a Digital Signature is the standard practice. Place a signature block on the first sheet of the PDF document as shown in **Figure 130.2.1**. A representation of the professional's seal next to the Digital Signature Appearance is not required for documents other than Contract Plans.

### **130.3.2 Manual Signing and Sealing**

For manually signed and sealed documents:

- Bound documents must include a cover page that is signed and sealed. If a document is to be signed and sealed by more than one professional, provide an index on the cover page to convey a list of pages that each licensee is responsible for.
- Un-bound documents require each sheet to be signed and sealed.

The following signed and sealed documents are to be placed in the district's Project File(s):

- (1) Specifications Package
- (2) Pavement Design Package
- (3) Typical Section Package
- (4) Drainage Computations
- (5) Hydraulics Reports
- (6) Bridge Development Report
- (7) Traffic Engineering Reports
- (8) Environmental Reports
- (9) Geotechnical Reports
- (10) Value Engineering Record

- (11) Permit Documentation
- (12) Design Exceptions and Design Variations

Modification for Non-Conventional Projects:

Delete the items No. (6) and (10) above.

## 130.4 Signing and Sealing Revisions

Design revisions are modifications to the PS&E Submittal after it has been accepted by Central Office Final Plans. Revisions made after the award of the contract are referred to as post-let revisions. Revisions should be prepared by the same professional that Signed and Sealed the plan sheet contained in the Record Set or the original document. When it is necessary to have the revision signed and sealed by a different professional, provide exculpatory language defining the professional's limits of responsibility.

### 130.4.1 Contract Plans Set

Prepare design revisions as outlined in **FDM 131**. Sign and seal the revision package PDF in accordance with **FDM 130.2**.

Prepare post-let revisions as outlined in **FDM 131** and **Chapter 5** of the [Construction Project Administration Manual \(CPAM\)](#). Sign and seal the revision package PDF in accordance with **FDM 130.2**.

### 130.4.2 Specifications

Prepare a Supplemental Specifications Package when it becomes necessary to revise either the Specifications Package or a previous Supplemental Specifications Package. Sign and seal the Supplemental Specifications Package in accordance with the [Specifications Handbook](#).

### 130.4.3 Other Design Documents

Sign and seal each revised sheet and place immediately behind the cover sheet of the original signed and sealed document.

Modification for Non-Conventional Projects:

Delete **FDM 130.4**.

## **130.5 Support Documents**

Engineering decisions are often made on the basis of support documents furnished by non-engineering staff or offices. Two support documents that require certification that they were prepared in accordance with Department procedures are shown in **Form 130-A** and **Form 130-B**. See **FDM 103** for all forms.

Modification for Non-Conventional Projects:

Delete **FDM 130.5** and see RFP for requirements.



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## 131 Plans Processing and Revisions

### 131.1 General

This section describes the critical activities required to process the contract plans, specifications and estimate for letting. It identifies the transmittal forms, certifications and other documents prepared by the District and the various offices involved in processing a Plans, Specifications & Estimates (PS&E) submittal package. This chapter also outlines the revision process, and the steps to resubmit a project that has been withdrawn from letting.

Projects must be electronically delivered in Digital Delivery format in accordance with **FDM 130** and the [CADD Manual](#). The latest information regarding the letting of electronic plans and specifications (including critical dates) will be posted on the **Final Plans Web Page** as new information becomes available.

Other specific requirements for processing the electronic delivery, including information on the Electronic Delivery software, can be found in the [CADD Manual](#).

#### 131.1.1 Contract Documents

The term “Contract Documents” includes all of the following which are to be treated as one instrument:

- (1) Advertisement for Proposal, Proposal, Certification as to Publication and Notice of Advertisement for Proposal,
- (2) Appointment of Agent by Non-resident Contractors,
- (3) Non-collusion Affidavit,
- (4) Warranty Concerning Solicitation of the Contract by Others,
- (5) Resolution of Award of Contract,
- (6) Executed Form of Contract,
- (7) Contract Bond,
- (8) Standard Specifications and Plans (including revisions thereto issued during construction),
- (9) Addenda, or other information mailed or otherwise transmitted to the prospective bidders prior to the receipt of bids, work orders, and supplemental agreements.

As used in **Standard Specification, Sections 2 and 3**, Contract Documents do not include work orders, and supplementary agreements. As used in **Standard Specification, Section 2**, Contract Documents also do not include Resolution of Award of Contract, Executed Form of Contract, and Contract Bond.

Modification for Non-Conventional Projects:

Delete FDM 131.1.1 and replace with the following:

### **131.1.1 Contract Documents**

The term “Contract Documents” includes: Advertisement, Request for Proposal (RFP), the Design and Construction Criteria Package, the Technical and Price Proposal, Certification as to Publication and Notice of Advertisement for Proposal, Appointment of Agent by Nonresident Contractors, Non-collusion Affidavit, Warranty Concerning Solicitation of the Contract by Others, Resolution of Award of Contract, Executed Form of Contract, Contract Bond, Design Liability Insurance, Specifications, plans (including revisions thereto issued during construction), Addenda, written statements or transcripts or minutes of oral representation by Design-Build Firm made at oral presentations, or other information mailed or otherwise transmitted to the prospective bidders prior to the receipt of bids, work orders and supplemental agreements, all of which are to be treated as one instrument whether or not set forth at length in the form of contract.

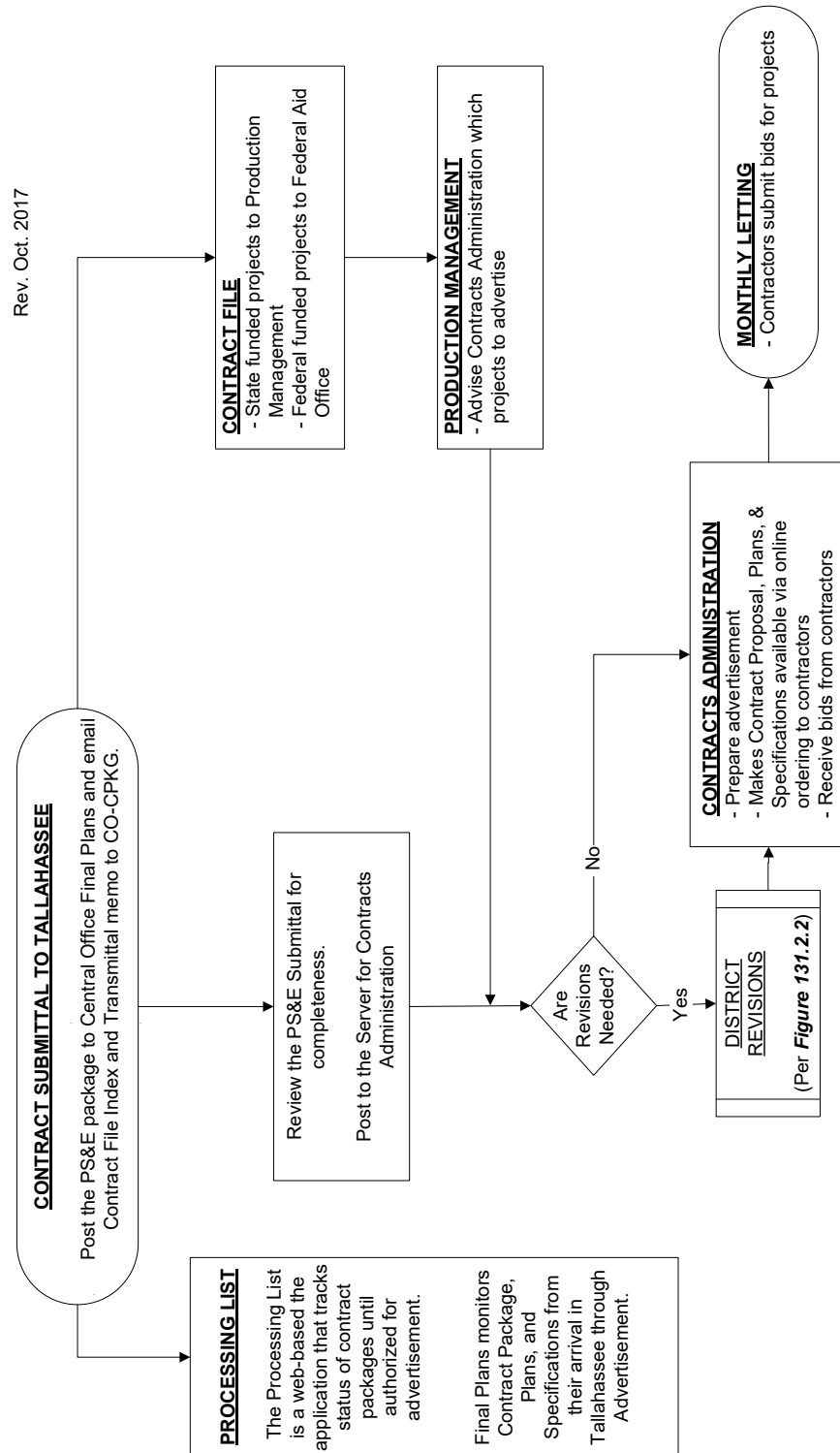
## **131.2 Plans Processing**

There are certain plans processing activities that occur at the District level prior to submitting plans to Tallahassee. These activities have schedule implications which will vary by District. Contact the appropriate District PS&E Office for specific requirements.

Modifications to the plans, specifications or quantities after District Estimates Office changes the Project Preconstruction (PrP) Workflow/Phase and before the Plans are sent to Tallahassee are referred to as Plan Changes. Plan Changes include revision, deletion, or addition of data on individual sheets, or adding and deleting entire sheets. Plan Changes are not noted in the Revision Block on the sheets.

**Figure 131.2.1** illustrates the process for submitting contract documents to Tallahassee for Letting.

**Figure 131.2.1 Plans Processing For Tallahassee Letting**



### **131.2.1 PS&E Submittal Package to Tallahassee**

Prepare and post the PS&E Submittal and the Authorization Estimate to the Central Office server no later than the PS&E submittal due date. Transfer control of the AASHTOWare Project Preconstruction™ (formerly TRNS•PORT) project files to the Final Plans section of the State Program Management Office when posting the PS&E submittal.

Email the Transmittal of Plans, Specifications and Estimates Package Memo (**Form 131-A**, see **FDM 103**), and the Contract File Index (**Form 131-B**, see **FDM 103**) with attachments, to CO-CPKG with a copy to the Department's Project Manager.

Upon receipt of the PS&E Submittal, the Final Plans section checks the package for completeness and records the date posted. If incomplete, the District Program Management Office is notified to provide a corrected submittal. Once accepted, the PS&E Submittal is posted to the server, for access by Contracts Administration.

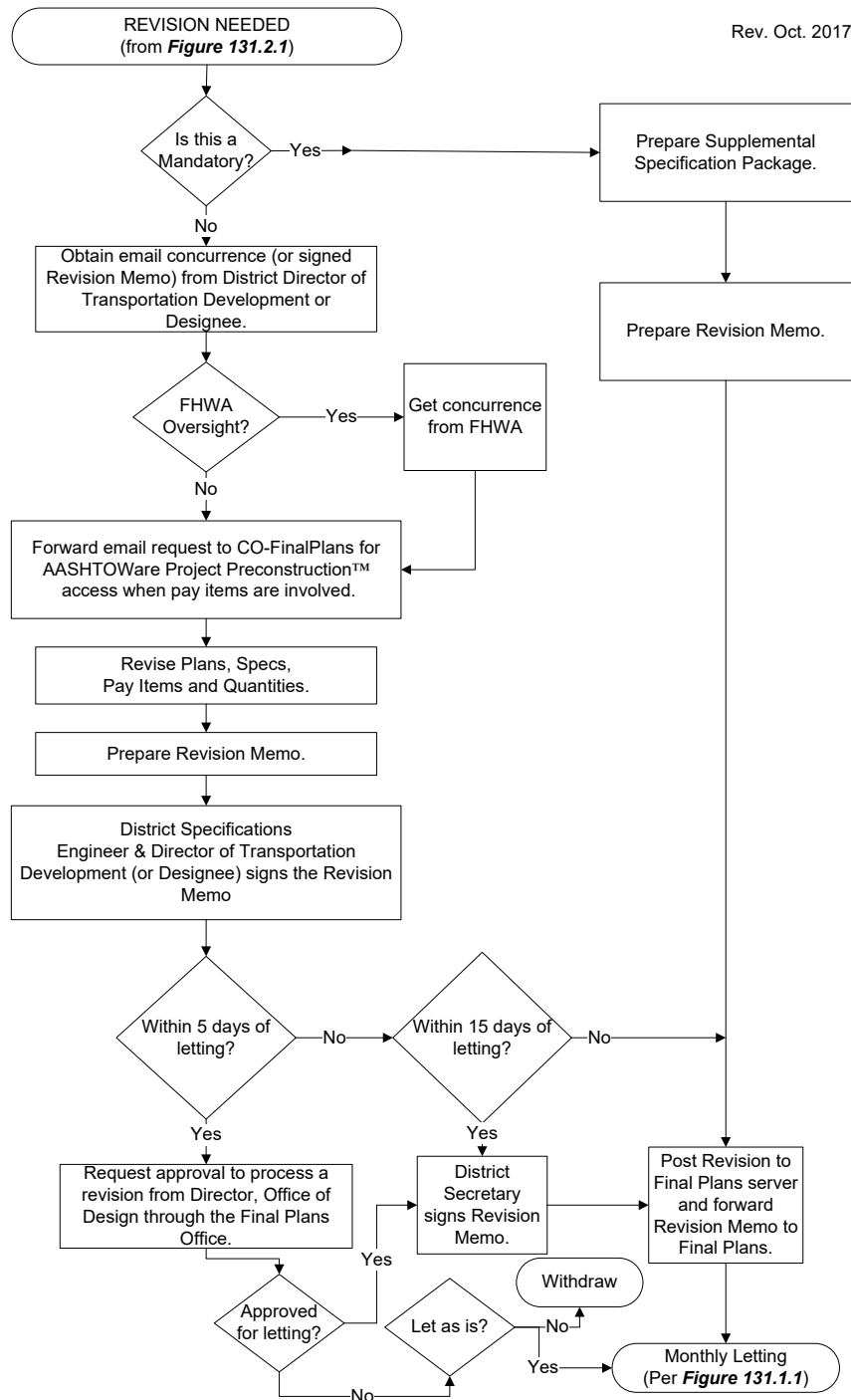
### **131.2.2 Revisions to the PS&E Submittal**

Revisions are modifications to the PS&E Submittal after it has been accepted by Central Office Final Plans. The Department's Project Manager ensures a revision is completed as follows (see **Figure 131.2.2**):

- (1) All revisions require a completed Revision Memo (**Form 131-C**, see **FDM 103**). When access to AASHTOWare Project Preconstruction™ (formerly TRNS•PORT) is required, obtain concurrence from the District Director of Transportation Development (or designee) and forward to Central Office Final Plans (CO-FINALPLANS). Concurrence may be in the form of an email that includes a summary of the revision or a signed Revision Memo. Access will then be returned to the District for a period not to exceed 2 business days.
- (2) In accordance with the Stewardship and Oversight Agreement or the project-specific Project of Division Interest (PoDI)/Project of Corporate Interest (PoCI), obtain an email concurrence from FHWA prior to making revisions or requesting District access to the AASHTOWare Project Preconstruction™ (formerly TRNS•PORT). Include the name of the FHWA contact and the concurrence date on the Revision Memo. Major changes to plans or specifications on PoDI/PoCI Projects made during the advertising period will require the FHWA Division Administrator's approval prior to issuing addenda. Major changes increase the project cost (>\$50,000), alter project termini, change the character of the project or modify scope of the work.
- (3) If information on the Transmittal Memo changes due to Project updates, submit a revised Transmittal Memo whether it is a formal Revision or not.

- (4) For revisions to plan sheets use a conspicuous unique numbered symbol (e.g., a numbered triangle) beside the revision that corresponds to the Plans Revision Number on the Revision Memo. Begin the revision numbering with “1” and number subsequent revisions to the contract plans set, sequentially. Place the revision date, corresponding numbered symbol for the revision, and a brief description of the revision in the Revision Block on each modified sheet. The same applies to adding sheets; however, the added sheets may be numbered with alphabetic suffix (e.g., 22A, 22B, 22C). If a sheet is being deleted, the sheet numbers for the following sheets remain unchanged. For revisions involving revised, added or deleted pay items, see **Form 131-C** (see **FDM 103**). See **FDM 302** for instructions on recording a revision on the Key Sheet.
- (5) The responsible professional Signs and Seals each revised document in accordance with the requirements of **FDM 130**.
- (6) Prepare the Revision Memo (**Form 131-C**, see **FDM 103**), providing a Revision Number and describing modifications. Record the revision date for each revised sheet, using the date shown in the revision block on the sheet.
- (7) District Specifications reviews the revision for any effect on the specifications then dates and signs the Revision Memo.
- (8) Ensure that revisions to the PS&E Submittal are posted to the Central Office server. Email a PDF of the signed Revision Memo to Final Plans, CO-FINALPLANS.
- (9) The District Secretary’s signature is required on the Revision Memo if the revision is submitted within 15 working days of the letting.
- (10) Approval from the Director of the Office of Design is required if the revision is submitted within five working days of the letting. Since there is no assurance that all prospective contractors will get these documents on time to be considered in their bids, approval for a revision within five working days of the letting is uncommon. If approval is not granted, the project will either be let as is, or be withdrawn from letting. Withdrawing or moving the project to a later letting after advertisement requires approval by the District Secretary and the Chief Engineer.
- (11) Upon email receipt of the signed Revision Memo, Final Plans will check the revisions for completeness.
- (12) Mandatory Specification Revisions issued from Central Office will be processed by Supplemental Specifications Package. Signatures are not required on the Revision Memo for Mandatory Specification Revisions unless other revisions are included with the package.

**Figure 131.2.2 District Revisions**



### 131.2.3 Re-submittal of Withdrawn Projects

When a District withdraws the entire PS&E Submittal for major revisions before the letting, the project will be resubmitted as a new transmittal of the PS&E Submittal with all required components. Include the note “Plans Completely Revised” on the Transmittal Memo next to the Transmittal date. Include note under the “Revisions” Header of the lead Key Sheet, “Plans completely revised (date)”. Show new Proposal/Contract ID number on Key Sheet(s).

Project documents in Central Office from the previous submittal will be destroyed or deleted. A project withdrawn for a period of nine months or longer will be updated according to the process outlined in **FDM 112**.

Plans rejected from letting by the Awards Committee or withdrawn for minor revisions may not need to follow the above process. District coordination with Central Office Production Management is required to reschedule a letting.

### 131.3 Revisions after Award

This section outlines the process for incorporating revisions after award (A.K.A. “Post-Let Revisions”), and outlines the steps for review by the Department.

It is the responsibility of the Department’s Project Manager to coordinate a review of design revision submittals performed by the appropriate District and Central Office discipline phase reviewers.

Modification for Non-Conventional Projects:

Revise the title of **FDM 131.3** and replace the two paragraphs above with the following:

#### **131.3 Revisions after Initial “Released for Construction” Stamping**

This section outlines the process for submitting component plan phase submittals as well as the review component plan phase submittals by the Department’s discipline reviewers. It also outlines “Released for Construction” stamping process prior to beginning work as well as the plans process for incorporating design revisions initiated by the Design Build Firm after initial “Released for Construction” stamping.

When revisions are required, comply with the following:

- (1) The responsible professional must Sign and Seal each revised document in accordance with the requirements of **FDM 130**.
- (2) Modify or delete data on individual sheets by striking through or crossing out. Do not delete data by erasing. Add new data adjacent to crossed out data. If a sheet does not have sufficient space for the revision, add new sheets as required.
- (3) “Cloud” any revisions after award in a conspicuous manner. If an entire sheet is being deleted, circle and strike through the entire drawing area and retain the deleted sheet in the plans package as a revised sheet.
- (4) Place a conspicuous sequentially-numbered unique symbol (e.g., a numbered triangle) beside the revision. Begin the revision numbering with “1” and number subsequent revisions sequentially. For sheets which have been revised pre-award, begin the numbering where the pre-award numbering left off. For large complex projects, when requested by the Department, number revisions by addendum issuance in order to more easily differentiate changes for work order/supplemental agreement processing. In this case, a shape other than a triangle may be utilized.

Modification for Non-Conventional Projects:

Delete Item (4) above and replace with the following:

- (4) Place a conspicuous unique numbered symbol (e.g., a numbered triangle) beside the revision. Begin the revision numbering with “1” and number subsequent revisions sequentially.

- (5) Place the revision date, corresponding numbered symbol for the revision, and a brief description of the revision in the Revision Block.

Signed and Sealed revised plan sheets will be delivered to the Department’s Project Manager prior to construction of any component. The Department’s Project Manager will send a copy of Signed and Sealed revised plan sheets to the appropriate discipline reviewers for review and comment. Discipline reviewers must respond in writing to the Department’s Project Manager and give recommendations for acceptance for incorporation into the contract documents. The Department’s Project Manager must issue the revised plan sheets as part of the contract documents after receiving recommendations from the discipline reviewers.



Modification for Non-Conventional Projects:

Delete the last two sentences and replace with the following:

Discipline reviewers must respond in writing to the Department's Project Manager and give recommendations for stamping once all comments have been satisfactorily resolved. The Department's Project Manager will initial, date and stamp each revised sheet as "Released for Construction" after receiving recommendations from the discipline reviewers.

### 131.4 Final "As-Built" Plans Process

See the *Construction Project Administration Manual (CPAM)* for preparing the Final "As-Built" contract documents during construction.

### 131.5 Retention of Electronic Documents

The documents and files created throughout the life of a project must be retained in electronic format. There are several different storage systems used for retaining these records. See **Figure 131.5.1**. As-built Documents that are to be scanned for electronic storage should meet both requirements of the **CPAM 5.12** and the **Information Technology Resource User's Manual (FDOT Procedure No. 325-000-002)**.

**Figure 131.5.1 Storage of Electronic Documents**

TIMS	PEDDS DATA BASE	Electronic Data Management System (EDMS) Legal Records for Department of State Requirements - <b>Image files ( PDF Version 1.7 or TIF) only.</b> For information on Specific Document Types stored in each Group contact the Responsible Office			
		DESIGN EDMS	CONTRACT EDMS	CONSTRUCTION EDMS	STRUCTURES MANAGEMENT EDMS
File management system for In-house CADD file check in/out.  Allows for multiple users to work on same files.  Working files only.  Can be used during Construction Phase to prepare As-Built Plans.	Electronic Vault for Storage of electronically signed, or digital delivery files  For Storage of: -Project CD -Plans and Specs CD -Revisions CD -Cat II Bridge As-Built Files  Files stored in the PEDDS Database cannot be written.	<u>Design Records</u> <u>Groups</u> Architectural Community Involvement Drainage Environmental Permits Estimates FDOT Publications Geotechnical/Materials Landscaping Lighting Product Evaluation Project Management Rdwy Design Documentation <b>Does not include Plans</b>  Roadway Resource Library Specifications Structures Structures Resource Library Tolls Facilities Traffic Design Utility Agreements  <b>NOTE: Contract Plans are not stored in the Design EDMS.</b>	<u>Contract Records</u> <u>Groups</u> Construction Contracts: - Amendments - Bid Blank - Certificate Of Insurance - Contract - Federal Aid Contract - Provisions - Permits - Pertinent Pages - Proposal - Special Provisions - Specifications - Supplemental Specifications - Utility Work Schedule - Wage Rate Supporting Construction Contract Documents: - Award Letter - Correspondence - Daily Diaries - Execution Letter - Final Estimates Package Work Progress  <b>NOTE: Contract Plans are not stored in the Contracts EDMS.</b>	<u>Construction Records</u> <u>Groups</u> Claims Compliance Contract Changes Includes Design Errors and Omissions, Field SA/Work Orders, and SA/Change Orders Contract Documents As-Built Plans Daily Diary Estimates Final Estimates General Correspondence Job Correspondence Material Sampling and Reporting Pre-Letting Includes Design Correspondence Quality Assurance/Quality Control Service Contracts Shop Drawing Transmittals Structure Sublet Work Time Correspondence Unpaid Bills Utility	<u>Maintenance Records</u> <u>Groups</u> Bridge Plans and Specifications Bridge Record Bridge Shop Drawings Correspondence Geotechnical High Mast Record Sign Record Structural Calculations - As-Bid Plans - As-Built Plans - Repair As-Bid Plans - Repair As-Built Plans - Widening As-Bid Plans - Widening As-Built Plans

## 140 Lump Sum Projects

Modification for Non-Conventional Projects:

Delete ***FDM 140***.

### 140.1 General

The purpose of Lump Sum projects is to reduce the costs of contract administration associated with quantity, verification and measurement. This contracting technique requires the Contractor to submit a lump sum price to complete a project as opposed to bidding on individual pay items. The Contractor will be provided a set of bid documents (plans, specifications) and will develop a Lump Sum bid for all work specified in the contract drawings.

The decision to use the Lump Sum Contracting Technique on a project should be made by the District Design Engineer in consultation with the District Construction Engineer. Lump Sum Projects should be identified during the scope development process, rather than during or after the design process. Conversion of partially complete plans and completed “plans on the shelf” that were originally developed as conventional bid item type projects to the Lump Sum Technique may require significant rework and is generally not recommended.

The contingency pay item is recommended on a Lump Sum project. This tool is used to compensate the Contractor for any additional work requested, which is not covered in the contract documents. District Construction should be consulted for the contingency amount.

### 140.2 Project Selection

Lump Sum contracting should be used on simple projects. “Simple” is defined by the work activity, not by the project cost. “Simple” projects are:

- (1) Projects with a well-defined scope for all parties (Design and Construction)
- (2) Projects with low risk of unforeseen conditions (i.e., projects that do not involve such things as significant underground utilities, earthwork variations, underground drainage pipes, bricks under pavement in urban areas)
- (3) Projects with low possibility for change during all phases of work – Design and Construction (i.e., limited possibilities for added driveways, median modifications due to developments, or changes due to political involvement)

Examples of projects that may be good Lump Sum contracting candidates:

- (1) Bridge painting
- (2) Bridge projects
- (3) Fencing
- (4) Guardrail
- (5) Minor Intersection improvements (with known utilities)
- (6) Landscaping
- (7) Lighting
- (8) Mill/Resurface (including Interstate) without complex overbuild requirements
- (9) Minor road widening
- (10) Sidewalks
- (11) Signing
- (12) Signalization

Examples of projects that may not be good Lump Sum contracting candidates are listed below. Use of Lump Sum contracting on these type projects requires written approval by the State Roadway Design Engineer:

- (1) Urban construction/reconstruction
- (2) Rehabilitation of movable bridges
- (3) Projects with subsoil earthwork
- (4) Concrete pavement rehabilitation projects
- (5) Major bridge rehabilitation/repair projects where there are many unknown quantities
- (6) JPA Projects with local agency funds

### **140.3 Plans Preparation**

Plan content should conform to the requirements of **Part 3**, subject to the guidance provided herein. Designers should detail plans, either by detailed drawings or plan notes, to clearly describe the work to be performed by the contractor. Special care should be used to insure pay item notes and other notes and requirements such as “as directed by the Engineer” are deleted or replaced with specific direction and details that can be properly bid on by the Contractor. Following are some of the desired elements in a set of Lump Sum plans:

- (1) A pay item note placed on the Summary of Pay Items sheet stating, “999-2 Lump Sum Contract: All other Pay item numbers shown in the Contract Plans are provided only for the purpose of describing the work to be performed. Pay item descriptions are found in the Department’s ***Basis of Estimates Manual.***” This note only needs to be placed the one time on this sheet. It should not be repeated on any other sheets within the Contract Plans.
- (2) Typical Sections.
- (3) Milling, resurfacing and overbuild details to show any cross slope corrections, including existing pavement cross slope information.
- (4) Document quantities for all work to be performed on the project by location in the summary boxes for Roadway and Structures disciplines or on a tabulation of quantities sheet for all other disciplines. Note: Summary boxes and tabulation sheets should not have totals. The standard summary boxes contained in the FDOT CADD software should be used.
- (5) Plan sheets to accurately depict existing conditions and detail all work to be performed by contractor. (i.e., show all limits of milling and resurfacing, pipe installations, limits of sod when different from typical section, all concrete work, guardrail removal/installation).
- (6) Details of work not covered by typical section or the [Standard Plans](#) (e.g., curb and gutter installation, traffic separator limits, special curb ramps, modifications to storm inlets).
- (7) Cross sections when shoulder break is moved. When cross sections are provided, earthwork columns should not be used.
- (8) Anticipated pile tip/drilled shaft elevations on bridge projects. Note: This is the predicted elevation to achieve axial capacity and satisfy all other design requirements and is usually deeper than the minimum tip elevation shown for piles.

#### **140.4 Preliminary Estimate**

If there is only one project in the contract, code in the pay item for Lump Sum (Alternative Bidding) (999-2) and the Initial Contingency Amount (Do Not Bid) Pay item (999-25). If there is more than one project in a single contract (strung projects), code both pay items on each project.

Provide data to the District Estimates Office to be used in the estimate process. The data necessary for preparing the preliminary estimate may differ with project type and complexity. Preliminary estimates for Lump Sum projects may be determined in a number of ways: data from the designer, historic data, long-range estimate (LRE), and by reviewing data from similar, current projects. The intent of Lump Sum Contracting is not

to shift the responsibilities or work involved in estimating quantities from the designer to the District Estimates Office. The cooperative effort of the designer in providing data in an electronic spreadsheet or other means acceptable to the District Estimates Office will be helpful in improving the Lump Sum Preliminary Estimate Process. Contact the appropriate District for specific requirements.

## **140.5 Specifications**

The Design Project Manager will provide an “Items of Work” checklist to the District Specifications Office. This checklist is **Form 140-A**, which is found in **FDM 103**. The Specifications Office will include the work items identified on the checklist in the “Intent and Scope” in the Specifications Package. The checklist must include, as a minimum, the major work items shown in the sample included with these guidelines.

Lump Sum Projects require Special Provisions that modify the first nine articles of the Standard Specifications. These Special Provisions are in the Specifications Workbook and must be included as part of the Specifications package.

Article 9-2 of the Special Provisions for Lump Sum Projects must be completed with predetermined unit prices for asphalt materials, concrete, and base when applicable. These unit prices will serve as a basis for calculating pay reductions for deficiencies accepted by the Project Engineer. In the case of asphalt overbuild, the predetermined unit price for the material used for overbuild will serve as a basis for pay adjustments for thicknesses that differ from the thickness shown in the plans. All predetermined unit prices should be based on an analysis of similar type projects let in the District and the District wide average of projects let within the six months prior to the letting date of the project.

For projects including bridges, Article 9-2 of the Special Provisions for Lump Sum Projects must be completed with predetermined unit prices for piling and drilled shafts as applicable. These unit prices will serve as a basis for pay adjustments for the actual quantities installed as additions or deletions from the individual element lengths shown in the plans. All predetermined unit prices should be based on an analysis of similar type projects let in the District and the Districtwide average of projects let within the six months prior to the letting date of the project.

## **140.6 Contracts Administration**

Contracts Administration will include the information provided in the Specifications Package “Intent and Scope” in the job advertisement. This information can be used by

the contractors/subcontractors to determine what type of work is contained in the project, in lieu of a list of pay items.

## **140.7 Construction Contract Administration**

Monthly payments will be made based on a payout schedule mutually agreed upon by the Department and the Contractor. The payout schedule will include only major tasks similar to what has been used on design-build projects.

Lump Sum contracts are not fixed price. Changed conditions, extra work and unforeseen work must be negotiated and resolved with the Contractor utilizing Supplemental Agreements and Work Orders on Contingency Supplemental Agreements.

Construction inspection personnel should not be required to document quantities except for asphalt and other items subject to pay adjustments (items with predetermined unit prices). Measurement and completion of “Final” quantity for summary boxes on plan sheets is not required. Focus should be on inspection and achieving a quality final product. For example, the Project Engineer will not be concerned with how many square yards of sod it takes or the number of miles of final striping. The Project Engineer will be charged with ensuring that the sod, striping, embankment, and pipe meets the lines and grades of the plans and specifications.

## **140.8 Materials Sampling and Testing**

The Laboratory Information Management System (LIMS), relies on the pay items identified in AASHTOWare Project Preconstruction™ (formerly TRNS\*PORT), which are populated via the Designer Interface, to generate a Job Guide Schedule based on the **Sampling, Testing and Reporting Guide (STRG)**. On Lump Sum projects, since there is no detailed pay item list to identify the various types of work, LIMS will output a generic Job Guide Schedule. Some materials will not actually be used depending on the project scope. Personnel should use the Job Guide Schedule entries applicable to their project and input sample data and field test results into LIMS system in accordance with standard procedures. Materials not included on the Job Guide Schedule will be accepted in accordance with **Section 6** of the [Standard Specifications](#) and other pertinent contract documents.