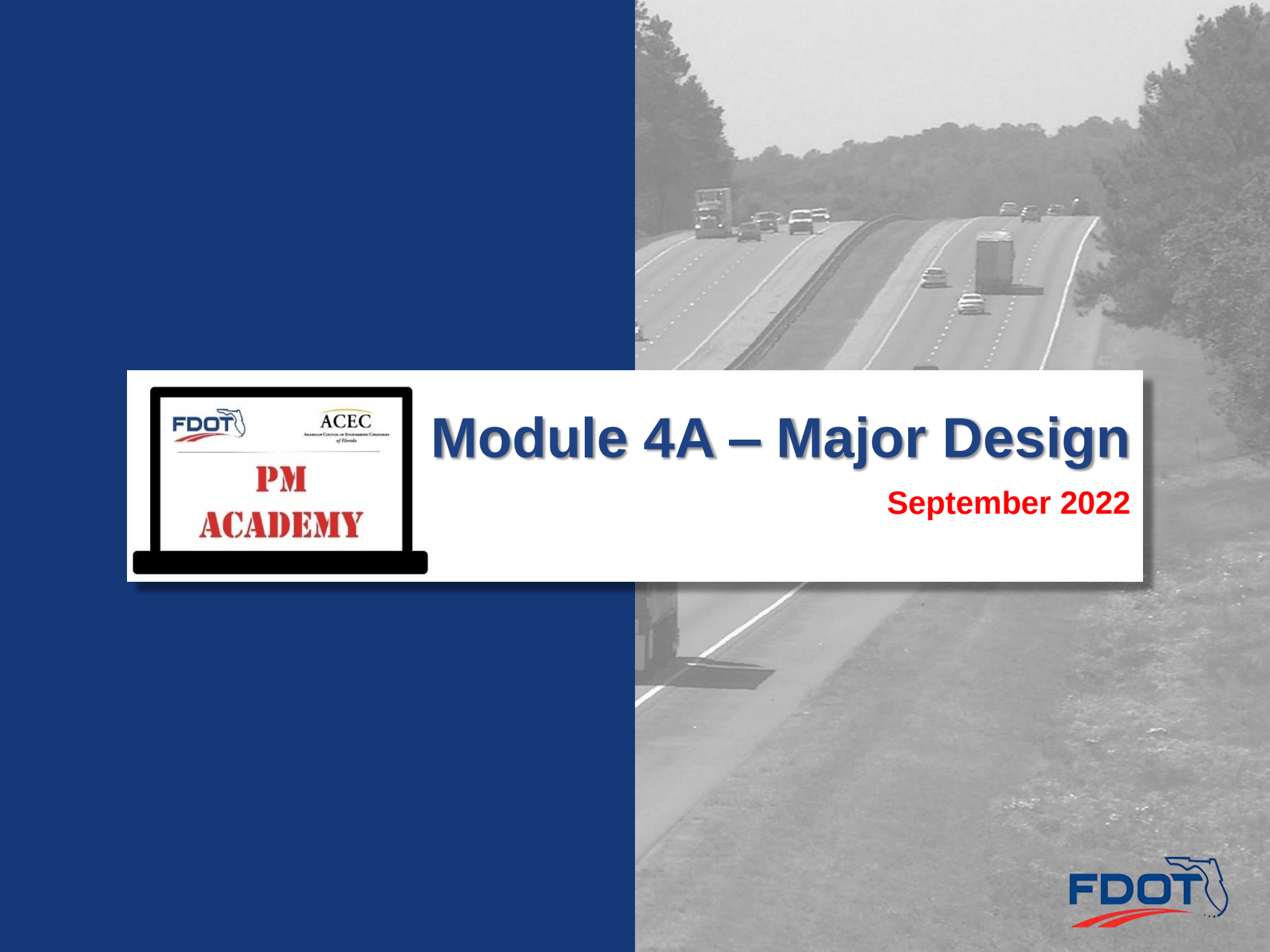

Module 4A – Major Design

September 2022

FDOT ACEC

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Major Design Process Overview

Mike Molkenbur, P.E.
Florida Department of Transportation
District 2 Consultant Project Management Engineer

What is Major Design

- **Work Types established in Florida Administrative Code 14-75**
- **3.2, Major Highway Design**
  - Urban projects with new curb and gutter
  - New or major reconstruction rural projects
  - Rural projects with substantial capacity improvements
  - Qualifications: At least two professional engineers and at least two years of post-registration experience with one year being in Major Highway Design
- **3.3, Controlled Access Highway Design**
  - Controlled access facilities = interstates, interchanges, and expressways
  - Qualifications: Same as 3.2, but at least one year of the post-registration experience must be in Controlled Access Highway Design

Examples of Major Design Projects

- **Widenings**
- **2 to 4 Lane Reconstruction**
- **New Alignment**
- **Operational Improvements**
  - Major intersection improvements
  - Interchange improvements
  - Alternative Intersections
- **Bridge Replacements**
- **Urban Drainage**

Project Delivery Methods

Delivery Methods for Design Phase

- **Combined Project Development & Environment (PD&E) and Design Contract**
  - Optional Phase II for Design must be in Contract Scope of Work
- **Project Specific**
- **Support Options**
  - Districtwide Design Contracts ($1.5 M or 5 years)
    - Bridge Repair Design Contract
    - Minor Design Miscellaneous Architectural Design
    - Drainage Contract
  - Continuing Services Design Contracts ($5 M or 5 years)
    - Minor Design Contract
    - Landscaping Design Contract
    - Design and Construction Services Contract
    - Safety Design Contract
    - Traffic Operations Design Contract

Delivery Methods for Construction

- **Design-Bid-Build**
- **Design-Build**
  - Low Bid Design-Build
  - Adjusted Score Design-Build
  - Progressive Design-Build
  - Design-Build-Operate
  - Design-Build-Finance
- **Factors to consider**
- **Overview of roles**

Early Steps

Early Steps in the Design Process

- Project Goals and Objectives
- Commitments from Project Development & Environment (PD&E) Study
- Preliminary Concept
- Needs identified in the Department's Safety Needs dashboard
- Field reviews
- Coordination with Department's discipline offices
- Scope of Services
- Project Budget & Schedule

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Context Based Design

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RS&H Inc.
Transportation Engineer

Context Based Design Approach

- Brief History
- The basis of Design Standards within Florida Design Manual (FDM)
- What is Context Classification
- How Context is defined
- Standards that are and are *not* affected by Context
- What's Next

A Brief History

- **1984: Florida Law requires bicycles and pedestrian facilities**
  - One size fits all approach
- **1999: Transportation Design for Livable Communities Policy**
- **2014: FDOT Adopts and Official Complete Streets Policy**
  - One size *doesn't* fit all
- **2018: Complete Streets is incorporated into the FDM**

FLORIDA'S COMPLETE STREETS
A 360° APPROACH

FDOT

Breakdown of Design Criteria

- **Design Criteria of the FDM is based on:**
  - Functional Classification
  - Design Speed
  - Context Classification

Highway Functional Classification

- The grouping of highways by the character of service and the connectivity they provide

Table 200.2.1 Design Types

Functional Classification	Primary Characteristics
Limited Access Facilities	• Limited access • Through traffic movements • Primary freight routes • Guided by FHWA Design Standards
Principal Arterial	• Through traffic movements • Longer distance traffic movements • Primary freight routes
Minor Arterial	• Connections between local areas and network principal arterials • Connections for through traffic between arterial roads • Access to public transit and through movements • Pedestrian and bike movements
Collector	• Carry traffic with trips ending in a specific area • Access to commercial and residential centers • Access to public transportation • Pedestrian and bicycle movements
Local Roads	• Direct property access—residential and commercial • Pedestrian and bicycle movements

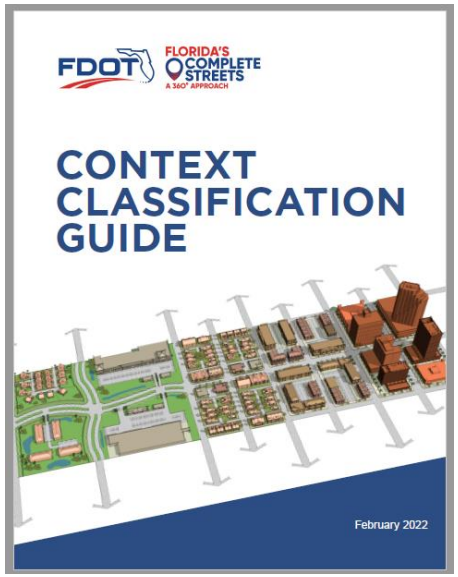
FDM 2022

Breakdown of Design Criteria

- **FDM provides design criteria for roads on the State Highway System (SHS) for the following Functional Classification:**
  - FDM 211: Limited Access (LA) Facilities (Interstate, Freeways, and Expressways)
  - FDM 210: Arterials and Collectors
- **Florida Greenbook provides criteria for Local Roads**
- **FDM 200: Context Based Design**

Context Classification

- **Implemented to advance Complete Streets Policy**
  - Serves the needs of all users of all ages and abilities
  - Promotes safety, quality of life, and economic development



Link: 2022 Context Classification Guide

FDOT

Context Classification

C1-Natural
Lands preserved in a natural or wilderness condition, including lands unsuitable for settlement due to natural conditions.

C2-Rural
Sparsely settled lands; may include agricultural land, grassland, woodland, and wetlands.

C2T-Rural Town
Small concentrations of developed areas immediately surrounded by rural and natural areas; includes many historic towns.

C3R-Suburban Residential
Mostly residential uses within large blocks and a disconnected or sparse roadway network.

C3C-Suburban Commercial
Mostly non-residential uses with large building footprints and large parking lots within large blocks and a disconnected or sparse roadway network.

C4-Urban General
Mix of uses set within small blocks with a well-connected roadway network. May extend long distances. The roadway network usually connects to residential neighborhoods immediately along the corridor or behind the uses fronting the roadway.

C5-Urban Center
Mix of uses set within small blocks with a well-connected roadway network. Typically concentrated around a few blocks and identified as part of a civic or economic center of a community, town, or city.

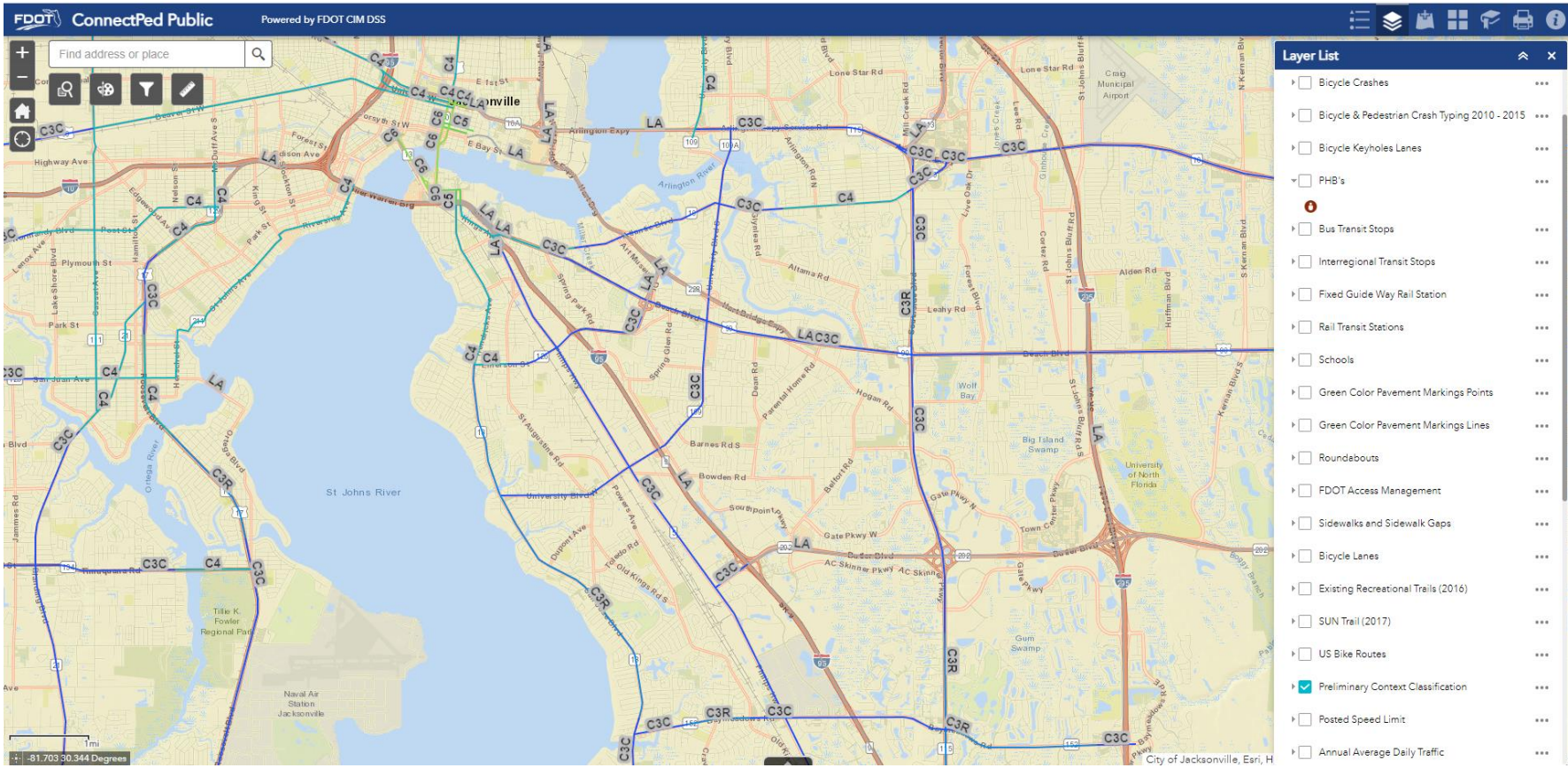
C6-Urban Core
Areas with the highest densities and building heights, and within FDOT classified Large Urbanized Areas (population greater than one million). Many are regional centers and destinations. Buildings have mixed uses, are built up to the roadway, and are within a well-connected roadway network.

Context Classification Designation

- **Should be established by the District prior to the development of the scope of services for the project's design phase**
  - Ensure that project budgets are accurate from the beginning
  - Help stabilize the work program

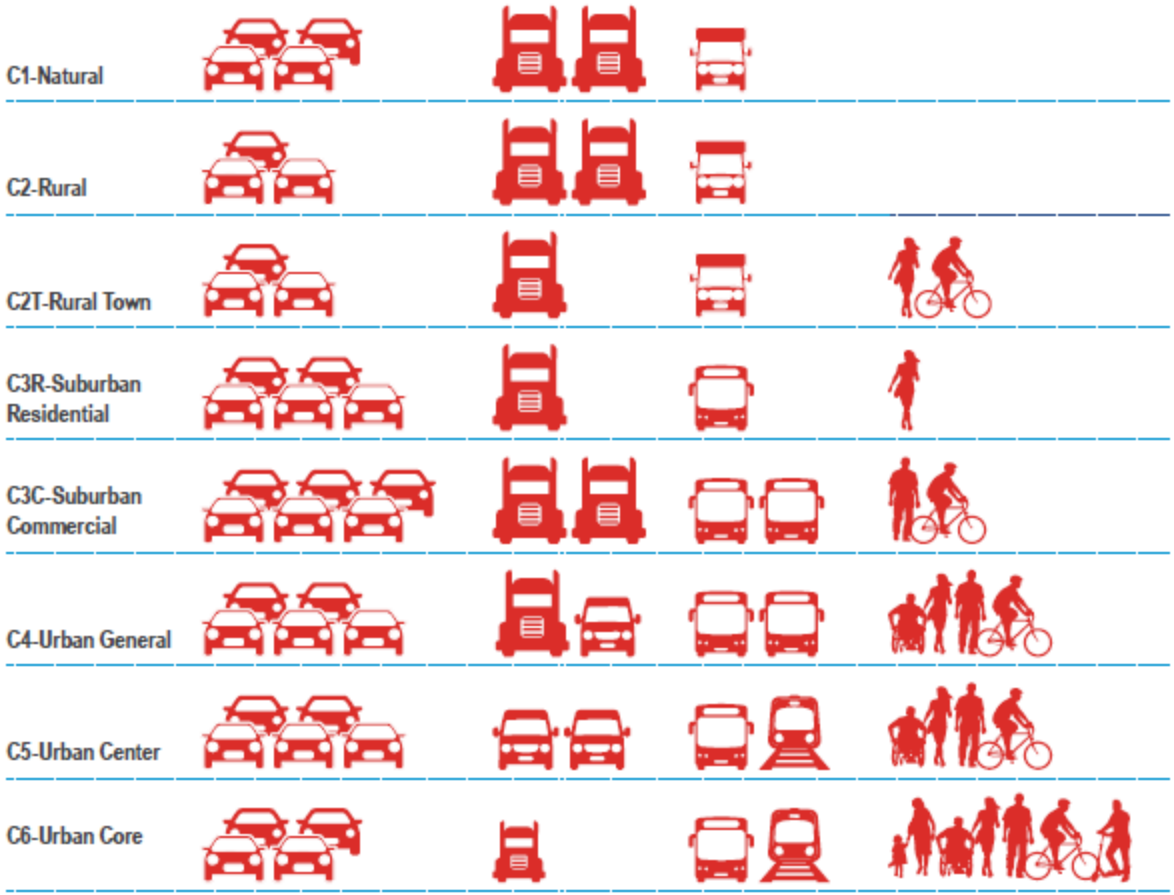
Identifying Context Classification

- **FDOT ConnectPed Database (*Link*)**



Safe System Approach

- Proactively determine where safety measures are applied



Context Based Design Criteria

- Design Speed (FDM 201.5.1)
- Minimum Lane Widths (FDM 210.2.1)
- Median Width (FDM 210.3.1)
- Border Width (FDM 210.7.1)
- Maximum Grades (FDM 210.10.1)
- Sidewalk Width (FDM 222.2.1.1)

Design Speed

Table 201.5.1 Design Speed

Limited Access Facilities (Interstates, Freeways, and Expressways)		
Area	**Allowable Range (mph)**	**SIS Minimum (mph)**
Rural and Urban	70	70
Urbanized	50-70	60
Arterials and Collectors		
Context Classification	**Allowable Range (mph)**	**SIS Minimum (mph)**
C1 Natural	55-70	65
C2 Rural	55-70	65
C2T Rural Town	25-45	40
C3 Suburban	35-55	50
C4 Urban General	25-45	45
C5 Urban Center	25-35	35
C6 Urban Core	25-30	30

Notes:

(1) SIS Minimum Design Speed may be reduced to 35 mph for C2T Context Classification when appropriate design elements are included to support the 35-mph speed, such as on-street parking.

(2) SIS Minimum Design Speed may be reduced to 45 mph for curbed roadways within C3 Context Classification.

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Vehicle Speeds

Design speed
Selected speed used to determine roadway geometric elements

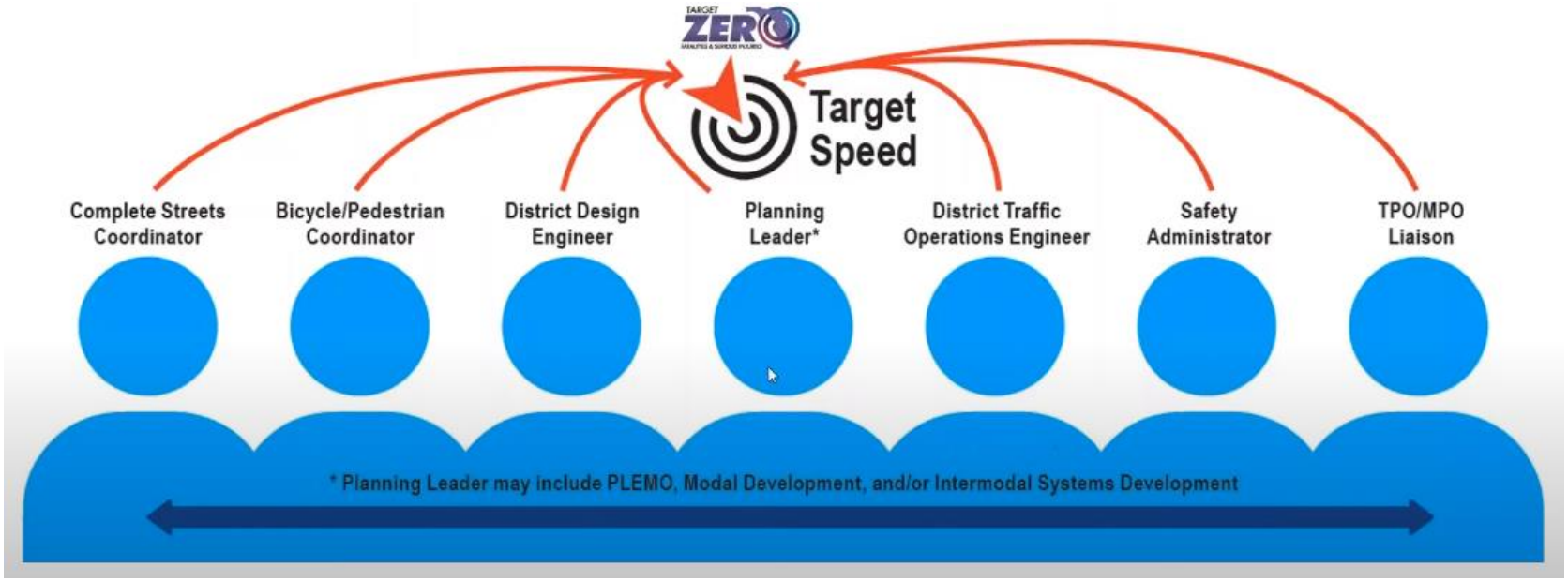
Operating speed
Speed at which drivers are observed traveling

Posted speed limit
Established by methods described in the Speed Zoning Manual

Target speed
Highest speed at which vehicles should operate in a specific context

Determining Speed Requires Coordination

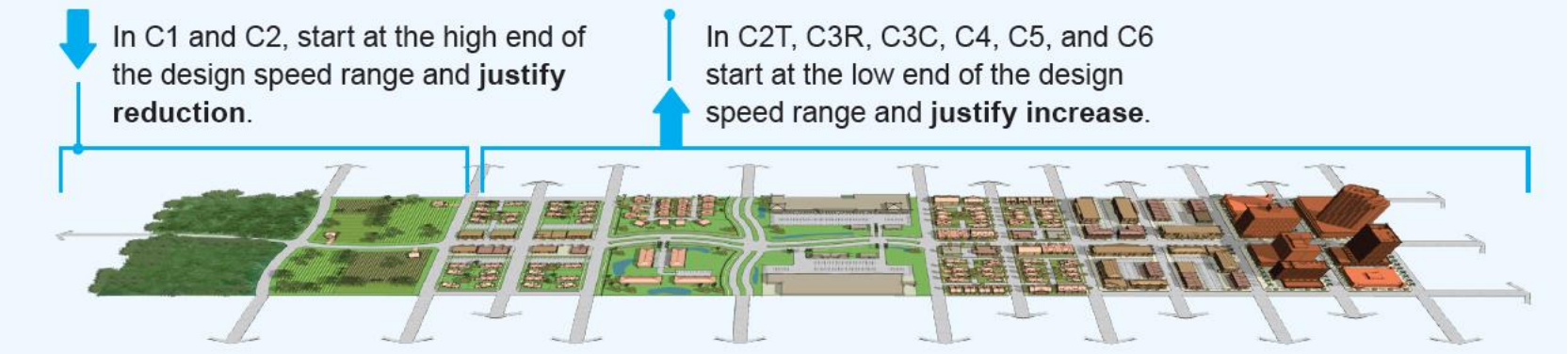
- Ultimately Determined by the Department



FDOT

Steps to Determine Target Speed

- **Determine Context and Identify Speed Range**



Steps to Determine Target Speed

- Identify Project Needs

Steps to Determine Target Speed

- Identify Project Needs
- Implement Speed Management Concepts of FDM 202.2 if necessary

Minimum Lane Widths

Table 210.2.1 Minimum Travel and Auxiliary Lane Widths

Context Classification		Travel (feet)			Auxiliary (feet)			Two-Way Left Turn (feet)	
		Design Speed (mph)			Design Speed (mph)			Design Speed (mph)	
		25-35	40-45	≥ 50	25-35	40-45	≥ 50	25-35	40
C1	Natural	11	11	12	11	11	12	N/A	
C2	Rural	11	11	12	11	11	12		
C2T	Rural Town	11	11	12	11	11	12	12	12
C3	Suburban	10	11	12	10	11	12	11	12
C4	Urban General	10	11	12	10	11	12	11	12
C5	Urban Center	10	11	12	10	11	12	11	12
C6	Urban Core	10	11	12	10	11	12	11	12

Notes:

Travel Lanes:

(1) Minimum 11-foot travel lanes on designated freight corridors, SIS facilities, or when truck volume exceeds 10% on very low speed roadways (design speed ≤ 35 mph) (regardless of context).

(2) Minimum 12-foot travel lanes on all undivided 2-lane, 2-way roadways (for all context classifications and design speeds). However, 11-foot lanes may be used on 2-lane, 2-way curbed roadways that have adjacent buffered bicycle lanes.

(3) 10-foot travel lanes are typically provided on very low speed roadways (design speed ≤ 35 mph) but should consider wider lanes when transit is present or truck volume exceeds 10%.

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Median Width

Table 210.3.1 Median Widths

Context Classification		Curbed Roadways and Flush Shoulder Roadways (feet)		High Speed Curbed Roadways (feet)	Flush Shoulder Roadways (feet)
		Design Speed (mph)			
		25-35	40-45	50-55	≥ 50
C1	Natural	N/A	N/A	30	40
C2	Rural	N/A	N/A	30	40
C2T	Rural Town	15.5	22	N/A	N/A
C3	Suburban	22	22	30	40
C4	Urban General	15.5	22	N/A	N/A
C5	Urban Center	15.5	N/A	N/A	N/A
C6	Urban Core	15.5	N/A	N/A	N/A

Notes:

(1) On reconstruction projects where existing curb locations are fixed due to severe right of way constraints, the minimum median width may be reduced to 19.5 feet for design speeds = 45 mph, and to 15.5 feet for design speeds ≤ 40 mph.

(2) A minimum 6-foot median may be used within C5 and C6 context classifications only where left turn lanes are not expected.

FDM 2022

Border Width

Table 210.7.1 Minimum Border Width

Context Classification		Minimum Border Width (Feet)					
		Curbed and High-Speed Curbed Design Speed (mph)				Flush Shoulder Design Speed (mph)	
		25-40	45	50	55	25-45	≥ 50
C1	Natural	N/A	N/A	29	35	N/A	40
C2	Rural	N/A	N/A	29	35	N/A	40
C2T	Rural Town	12	14	N/A	N/A	33	N/A
C3	Suburban	12	14	29	35	33	40
C4	Urban General	12	14	N/A	N/A	33	N/A
C5	Urban Center	12	N/A	N/A	N/A	N/A	N/A
C6	Urban Core	14	N/A	N/A	N/A	N/A	N/A

Notes:

(1) On low-speed curbed roadways that have an adjacent bike lane, the required border width shown in the table may be reduced by 2 feet.

(2) On existing roadways where R/W cannot be acquired or where the decision has been made to simply maintain and preserve the facility, the absolute minimum border under these conditions is 8 feet. No Design Variation is required for this condition.

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Maximum Grades

Table 210.10.1 Maximum Grades

Context Classification	Maximum Grades (percent)								
	Design Speed (mph)								
	25-30	35	40	45	50	55	60	65	70
C1 Natural C2 Rural	N/A	N/A	N/A	N/A	4	4	3	3	3
C2T Rural Town C3 Suburban C4 Urban General	8	7	7	6	6	5	N/A	N/A	N/A
C5 Urban Center C6 Urban Core	8	8	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:

(1) Maximum grade used should not exceed 4% when truck volume ≥ 10% for all context classifications.

(2) For RRR projects, when existing grades do not meet the above requirements but meet the standards in effect at the time of construction, the existing grade may remain.

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Standard Sidewalk Width

Table 222.2.1 Standard Sidewalk Widths

Context Classification		Sidewalk Width (feet)
C1	Natural	5
C2	Rural	5
C2T	Rural Town	6
C3	Suburban	6
C4	Urban General	6
C5	Urban Center	10
C6	Urban Core	12

Notes:

(1) For C2T, C3 and C4, sidewalk width may be increased up to 8 feet when the demand is demonstrated.

(2) For C5 and C6, when standard sidewalk width cannot be attained, provide the greatest attainable width possible, but not less than 6 feet.

(3) For RRR projects, unaltered sidewalk with width 4 feet or greater may be retained within any context classification.

(4) See ***FDM 260.2.2*** for sidewalk width requirements on bridges.

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Criteria Independent of Context

- Standard Shoulder Widths
- Cross-Slopes and Superelevation
- Horizontal Curves
- Vertical Curves
- Stopping Sight Distance
- Bicycle Lane Width

Gathering Data

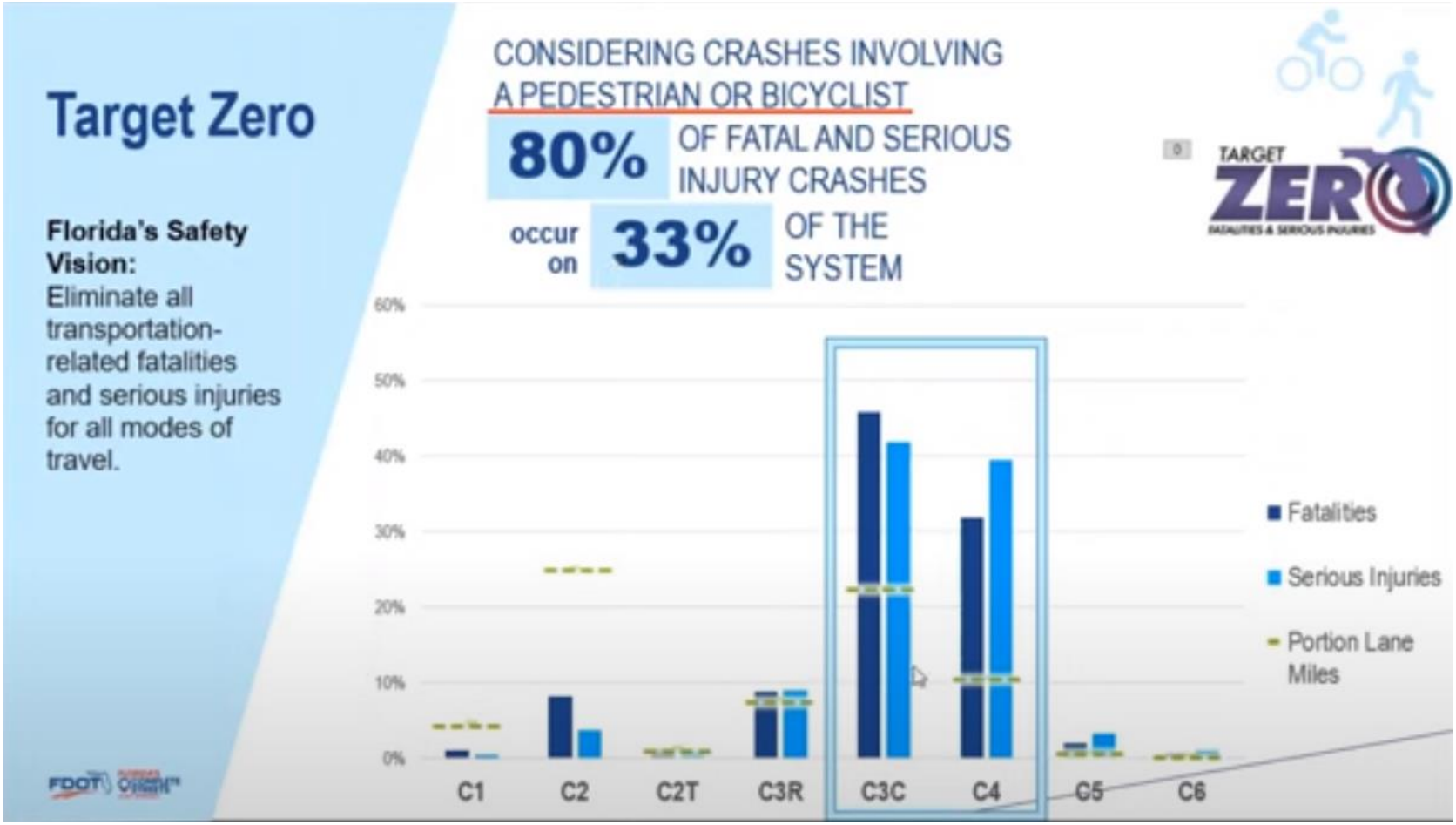
USING CONTEXT CLASSIFICATION TO UNDERSTAND OUR SAFETY PROBLEMS

76% of fatal and serious injury pedestrian and bicycle crashes occur in C3C or C4 Contexts

	C1	C2	C2T	C3R	C3C	C4	C5	C6	Limited Access	State Road Network
Lane Miles ††	2,071 (5%)	11,286 (25%)	521 (1%)	3,436 (8%)	10,084 (22%)	4,790 (11%)	305 (<1%)	93 (<1%)	12,345 (27%)	44,931
Number of Fatalities and Serious Injuries on Entire State Roadway Network (SDIS, 2015-2020)										
Bike/Ped	61 (1%)	461 (5%)	98 (1%)	794 (8%)	3,809 (41%)	3,269 (35%)	254 (3%)	85 (1%)	545 (6%)	9,376
All Users	1,055 (1%)	9,713 (14%)	535 (1%)	6,711 (9%)	24,839 (35%)	12,342 (17%)	698 (1%)	192 (<1%)	15,200 (21%)	71,285

†† Source: RCI database queried by TDA and reported on 6/14/2021.

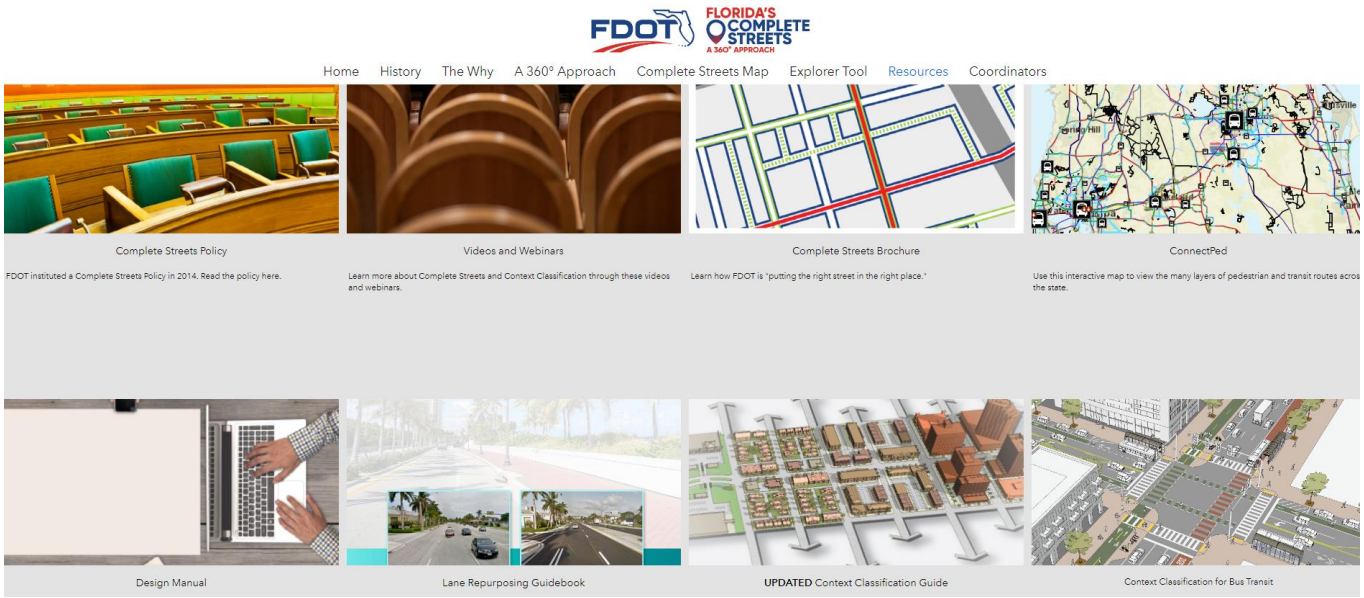
Gathering Data



Current Vision

Additional Resources

- http://www.flcompletestreets.com/



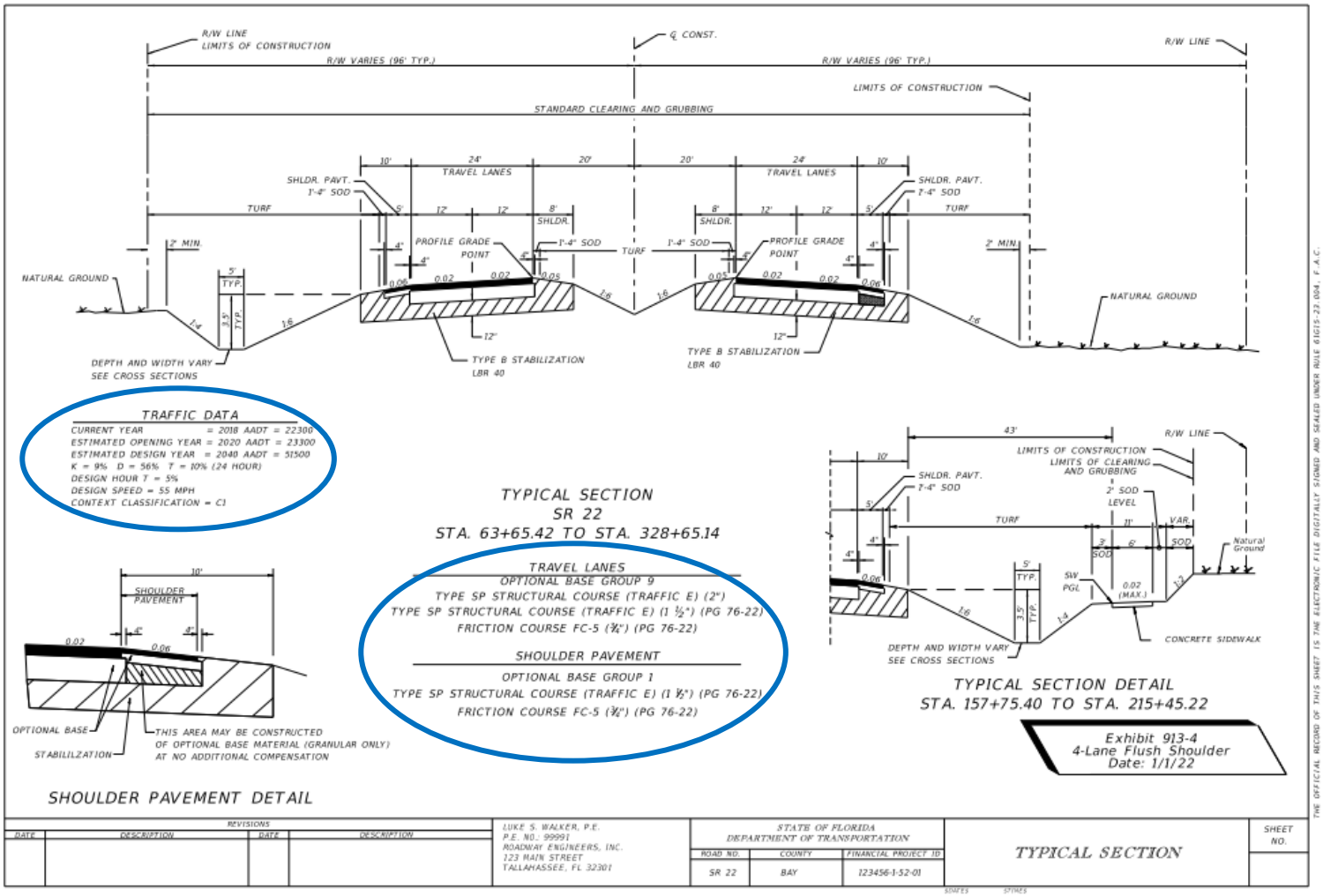
- Youtube: 2022 FDOT Context Classification Update

Typical Sections

Purpose

- Sets the stage for Concept Development
- Documents Context Classification
- Coordination with Local Stakeholders
- Provides details for Construction

Purpose



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Scope and Negotiations – Lessons Learned

- **Most projects are rarely typical**
  - Additional details for Traffic Separators, Widening, and Drainage

306.2.1 Half Sections and Details

Half sections and details supplement or support typical sections. They should be placed on the same sheet as the typical section to which they apply. In the event that this is not possible, additional sheets for details should be placed behind the typical section sheet(s).

Half sections are necessary when changes occur that affect several typical section elements (e.g., number of lanes, border width, ditch, or drainage features, clearing and grubbing, R/W width).

Details and partial sections are necessary for the clarification of construction techniques or sequence and to show alternates (e.g., the placement of shoulder gutter in high fill areas, changes in sidewalk location). Judgment is necessary in making decisions about when and where details should be shown.

Scope and Negotiations – Lessons Learned

- **Upfront approval for Cross Slopes**
  - Includes overbuild and cross slope correction details
- **Bridge Typicals are shown in the Typical Section Package**
- **Coordination with Local Stakeholders**
  - For example, 3% might be their Standard

Typical Section - Schedule

- **Typical Section Package Submittal – before Phase II**
  - Includes overbuild and cross slope correction details
- **BDR Approval requires Typical Section**
- **TSP previously submitted during PD&E**

Concept Development

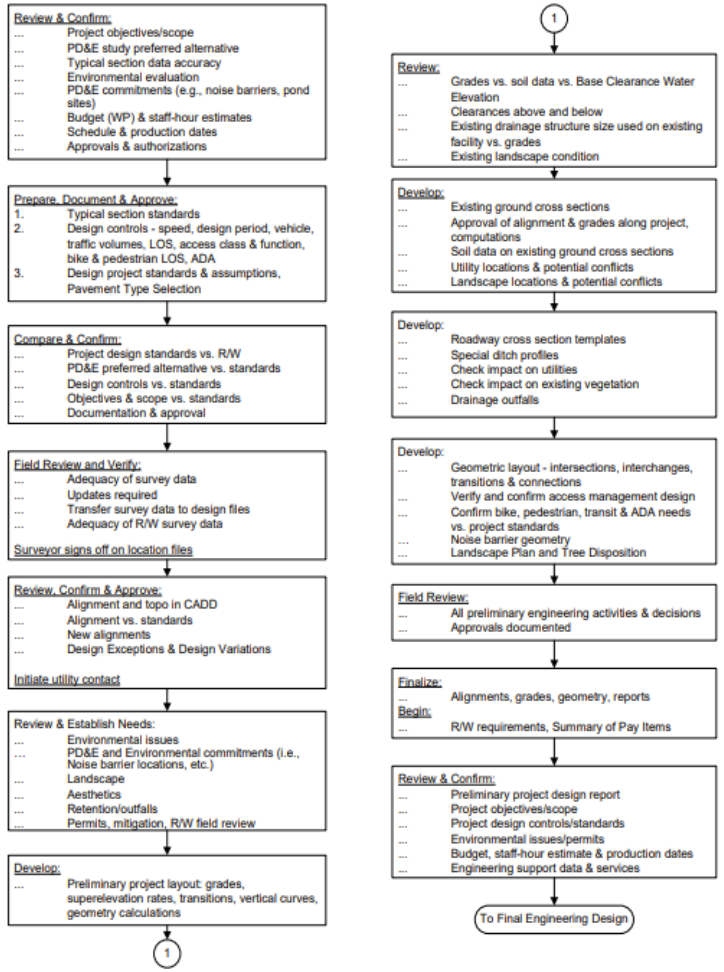
Every Project starts with a Concept

- **Typically developed during PD&E**

- **PD&E Purpose:**
  - Determine Right of Way takes
  - Establish a Purpose and Need
  - Define Project Commitments
  - Obtain NEPA and Traffic Approval to push a Project forward

Initial Engineering Design Process

Figure 110.1.1 Major Activities – Initial Engineering Process



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Concept Development – Design

- **Coordinate Geotech scope and schedule as soon alignment changes become minimal**
- **Identify critical utilities especially if they are Reimbursable**
- **Reduce Right-of-Way Impacts**
- **Steel Bridges vs Concrete Bridges**
- **Establishing Design Controls imperative**
  - Context Classification
  - Design Vehicle
  - Project Commitments
  - Queue Length

Concept Development – Lessons Learned

- **Be Flexible. Expect Change**
- **Cost Estimates**
  - Early and Often
- **Understand and Communicate which details are important**
  - Is it a drop in the bucket?

Concept Development – Lessons Learned

- **Interchange Access Request (IAR)**
  - 9-12 month effort for acceptance
- **Interchange Modification Report (IMR)**
  - 6 month effort for acceptance
  - Example: Changing interchange from Diamond to DDI
- **Interchange Operational Analysis Report (IOAR)**
  - Example: single to double lefts, free-flow right to stop condition, adding queue length
  - Does not shift ramp gores
- **Beware of Changes to the Class of Action Determination**
  - Right-of-Way, EIS, NEPA

Cost Estimating

Cost Estimating – Concept Level

- **PD&E**

4.17.1	**Comparative Alternatives Evaluation***	LS	16 to 80	This task includes the development of an evaluation matrix and the qualitative and quantitative analysis of the project alternatives. The criteria for determining the number of hours needed for this task are the number of alternatives and segments and the level of detail for the concepts.	1 alternative, build no-build (16 to 24 hrs)	2 or 3 alternatives, few issues (24-48 hrs)	Multiple alternatives and issues (48-80 hrs)

- **Funding Sources change and become available**
  - Be prepared to develop early and often
- **When evaluating alternatives ensure “Apples to Apples”**
  - If scope is added at a later Alternative, consider updating a previous estimate
- **Engage District Estimates Office for current Unit Costs**

Cost Estimating – LRE

- Complete at 30% Design
- Sets budget in Work Program
- Important to Engage District Estimates Office for current Unit Costs
- Ensure Pavement Design is complete

Scope and Negotiations

- **PD&E**

4.16 CONSTRUCTION AND RIGHT OF WAY COST ESTIMATES

4.16.1 Construction Cost Estimates

The CONSULTANT will develop construction cost estimates using the Department's Long Range Estimate (LRE) program. The CONSULTANT will be responsible for reviewing and updating the cost estimate when scope changes occur, at project milestones, and during the DEPARTMENT's annual Work Program update cycle. Construction costs must include traffic management and right of way costs.

4.16.2 Right of Way Cost Estimates

Based on typical section analysis and DEPARTMENT design standards, the CONSULTANT will establish construction limits and determine the minimum (proposed) right of way requirements throughout the limits of the Project. Establishment of construction limits will consider location drainage features, the transportation management plan, utility relocations, stormwater pond requirements, and identified environmental issues, among other factors.

The CONSULTANT will compare the existing right of way width with the proposed right of way requirements to estimate the amount of right of way that the DEPARTMENT must acquire.

- **Final Design:**

3 PROJECT COMMON AND PROJECT GENERAL TASKS

Project Common Tasks

Project Common Tasks, as listed below, are work efforts that are applicable to many project activities, 4 (Roadway Analysis) through 36 (3D Modeling). These tasks are to be included in the project scope in each applicable activity when the described work is to be performed by the CONSULTANT.

Cost Estimates: The CONSULTANT is responsible for producing a construction cost estimate and reviewing and updating the cost estimate when scope changes occur and/or at milestones of the project. Prior to Phase II plans or completion of quantities, the DEPARTMENT's Long-Range Estimate (LRE) system will be used to produce a conceptual estimate, according to District policy. Once the quantities have been developed (beginning at Phase II plans and no later than Phase III plans) the CONSULTANT shall be responsible for inputting the category information, pay items, and quantities into AASHTOWare Project Preconstruction through the use of the DEPARTMENT's Designer Interface.

Scope and Negotiations

- **Negotiation Fee Estimate (PD&E):**

				drainage maintenance.			
4.16	**Construction and Right of Way Cost Estimates**						
4.16.1	**Construction Cost Estimates***	LS	See Basis for Staff Hour Range	This task includes the development of construction cost estimates using LRE. The criteria for determining the hours needed for this task are the number of segments, number of typical sections, and special features.	1 alternative, build (12 to 16 hrs initial; 2 to 8 hrs update)	2 or 3 alternatives, few issues (16 to 28 hrs initial; 8 to 12 hrs update)	Multiple alternatives and many issues (28 to 40 hrs initial; 12 to 16 hrs update)
4.16.2	**Right of Way Cost Estimate***	LS	See Basis for Staff Hour Range	This task includes coordination and preparation of project materials needed to support ROW cost estimates including meetings with District and field reviews. The hours needed for this task is based on an initial set up of 16 hours + 20 hours per 100 parcels per alternative. (hrs per sheet = 1-4 hrs per sheet)	Coordinate with the District Right of Way Office for hours		
4.17	**Alternatives Evaluation**						

- **Negotiation Fee Estimate (Final Design):**

4.16	Cost Estimate	LS	See Basis for Staff Hour Range	Reviewing Departments LRE, preparing an initial cost estimate, and updating as necessary. (LS based on LRE develop/review range of 4-12 hours per update, Engineers Estimate range of 12-40 hours per update.)
	Technical Special			

LRE - Best Practices

- **Closed Drainage vs Open**
  - LRE Values are typically low
  - Recommend a conceptual layout for project or apply assumptions from a small segment
- **Component Submittals not required**
  - Conceptual ITS, Signing, Signals and Lighting design is preferred
- **Bridge ($/SF) values from BDR**

LRE – Best Practices

- **Break up LRE to easily update or remove specific segments**

- **Incorporate 3D design into schedule**
  - Embankment can be highest line item

TRNSPRT

- **Initial Input at 60%**
- **Sets budget for encumbering funds**
- **All Components Entered**
- **Unit Costs will likely change again**
- **Be aware of pay-item changes since LRE input**
- **Design Build**
  - Input Structures Pay Items (Cost/SF not allowable)

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PM ACADEMY

Data Collection

Keith Travis, P.E.
Parsons Transportation Group Inc.
Project Manager

Data Collection – Introduction

- **When**
  - Takes place from concept development through final design, construction, and throughout the life of the project
- **High-level Perspective**
  - What data is typically collected
  - How it is collected
  - How the data is used
  - Items that a PM should be aware of
- **Data Types**
  - Planning & Environmental
  - Traffic
  - Design Survey
  - Geotechnical

Data Collection – General

- **Field Data Collection**
- **Documented Safety Plan**
  - Safety representative
  - Safety training / staff orientation
  - Work activity description
  - Identifies potential hazards
  - Hazard mitigation strategies
    - Personal Protective Equipment – hard hats, vest, boots, fall harness, cones/barricades
    - Traffic Control Plan – help traveling public acknowledge the workzone
  - Incident reporting structure
  - Emergency action plan
  - Lessons learned

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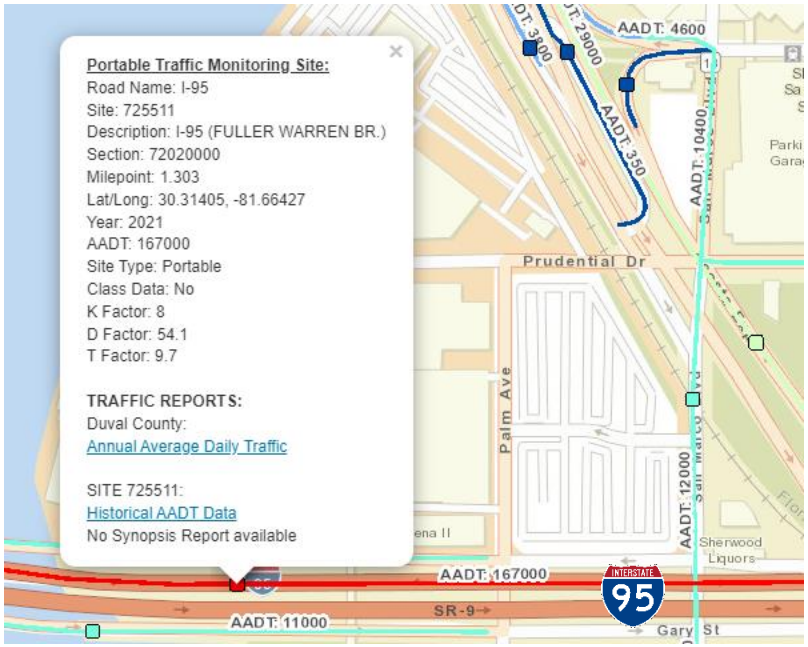
Data Collection – Planning & Environmental

- **How Used?**
  - Identifies features that may influence the recommended alternative by avoidance and assists in identifying mitigation strategies for impacts that cannot be avoided
- **Florida Department of Environmental Protection (FDEP) GIS**
  - Environmental, State Lands & Parks
- **Florida Geographic Data Library (FGDL)**
  - Land Use, Soils, Transportation, Environmental, etc.
- **City and County GIS**
  - ROW / Parcel Lines, Community Features, Evacuation Zones, etc.
- **PD&E Manual Part 2: Topic & Analysis**
  - Cultural
    - Cultural Resource Assessment Survey (CRAS) : Identify Archaeologic, Historic, Architectural, and Cultural resources
  - Natural Environment
    - Natural Resource Assessment (NRE): Evaluate protected species and habitat and wetlands
  - Physical Environment
    - Contamination Screening Evaluation (CSE): Identify contamination sources

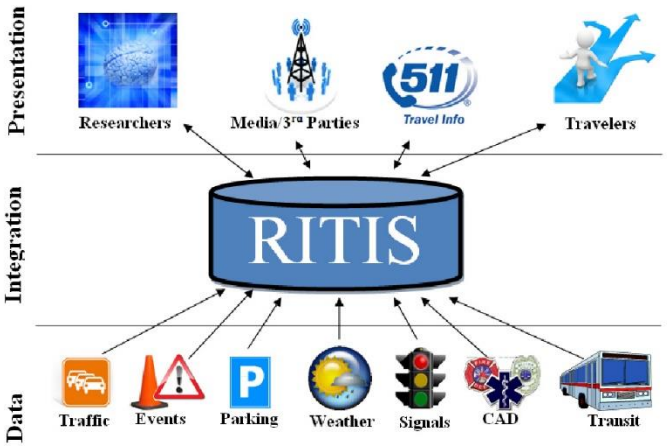
Data Collection – Traffic

- **FDOT Traffic Analysis Handbook, 2021**
- **FDOT Traffic Forecasting Handbook, 2019**
- **FDOT Traffic Monitoring Handbook, 2018**
- **FDOT Florida Traffic Online – interactive online web application**
  - Collected annually, processed Jan-Mar, published in April
  - Obtain volume, speed, direction, vehicle classification and/or weight
  - AADT, K, D, and T factors
  - Portable (PTMS), short-term
  - Telemetered (TTMS), continuous counts used by the FDOT Transportation Data & Analytics Office



Data Collection – Traffic

- **Field Traffic Data**
  - AM/PM Intersection Counts – determine peak hour turning movement volumes
  - 24/48/72-hour tube counts – supplement FDOT Traffic Online data
  - Travel time data
  - Roadway characteristics (lane geometry, turn lane length, ped features, etc)
- **Other Potential Traffic Data Sources to Keep in Mind**
  - FDOT Straight Line Diagrams – physical roadway, structure, drainage features
  - StreetLight – smartphones as sensors to obtain volume and origin-destination data
  - Regional Integrated Transportation Information System (RITIS) – Both real time and archived traffic information such as travel times, corridor peak periods

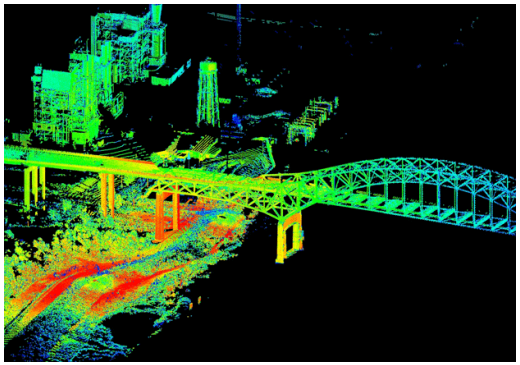


Data Collection – Traffic

- **Crash Data**
  - FDOT Crash Analysis Reporting (CAR) System (CAR on-line)
    - Data dump – location, direction of travel, type, severity, light and weather conditions
    - 10-month lag for location validation
    - Analysis performed using spreadsheet queries and pivot tables
  - SSOGis – FDOT State Safety Office Geospatial query tool uses CAR data
  - Signal 4 Analytics
    - Web-based geospatial crash analytical tool hosted by the University of Florida
    - Database updated daily
- **Uses**
  - Identify need for safety improvements
  - Input to Intersection Control Evaluation (ICE) and Highway Safety Manual toolsets
  - Design Exceptions/Variations

Data Collection – Design Survey

- **Understanding of scope to avoid remobilization and delays**
  - Survey beyond (25%) the constructed footprint: off-site drainage and unknowns
  - Typically includes control survey, topo survey, utility survey and often R/W mapping
- **Selection of the correct tools based on the need**
  - Photogrammetry/Aerial Lidar suitable for large projects w/ significant terrain or relief features
  - Ground-Based LiDAR provides a 3D point cloud to provide vertical and overhead features – suited for existing roadway, urban settings, complex geometry
  - Traditional survey needed for obscured areas (heavy vegetation, wet areas, and subsurface features such as utilities and drainage)



  - Hydrographic survey – uses sonar to model under water conditions needed for bridge structure hydraulic/scour analysis
- **Safety**
  - Both photogrammetry and LiDAR keep field crews off the roadway

Data Collection – Geotechnical Survey

- **Data Uses**
  - Roadway, Structures, and Pond Site
- **Equipment Access Considerations**
  - Maintenance of Traffic
  - Utilities
    - Subsurface utilities
    - Consider overhead utility clearance in urban environments
  - Property owner coordination
    - New alignment projects and off-site ponds may require coordination between FDOT R/W and owner
    - Avoid potential to damage to hardscape, landscape, rutting from geotechnical equipment

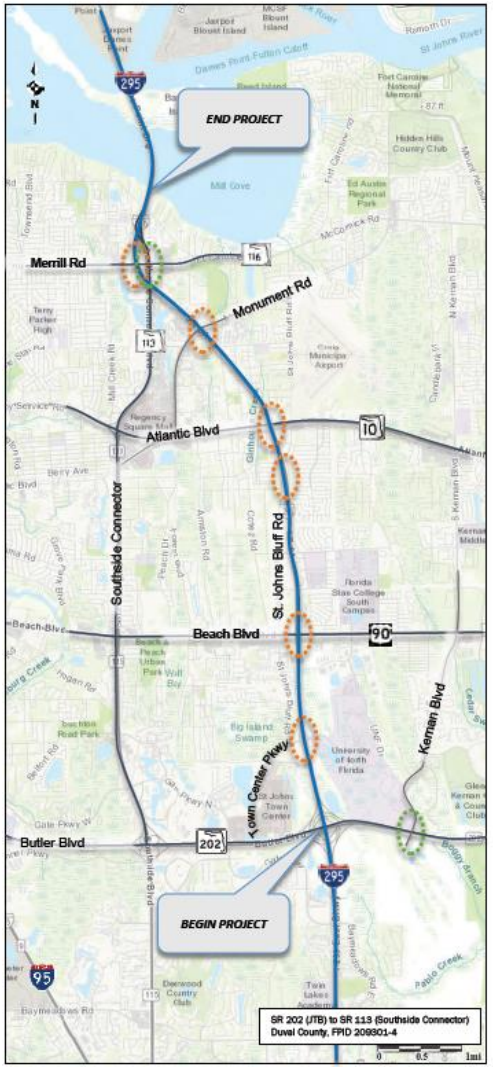
Design Development

Design Development – 15% Line & Grade

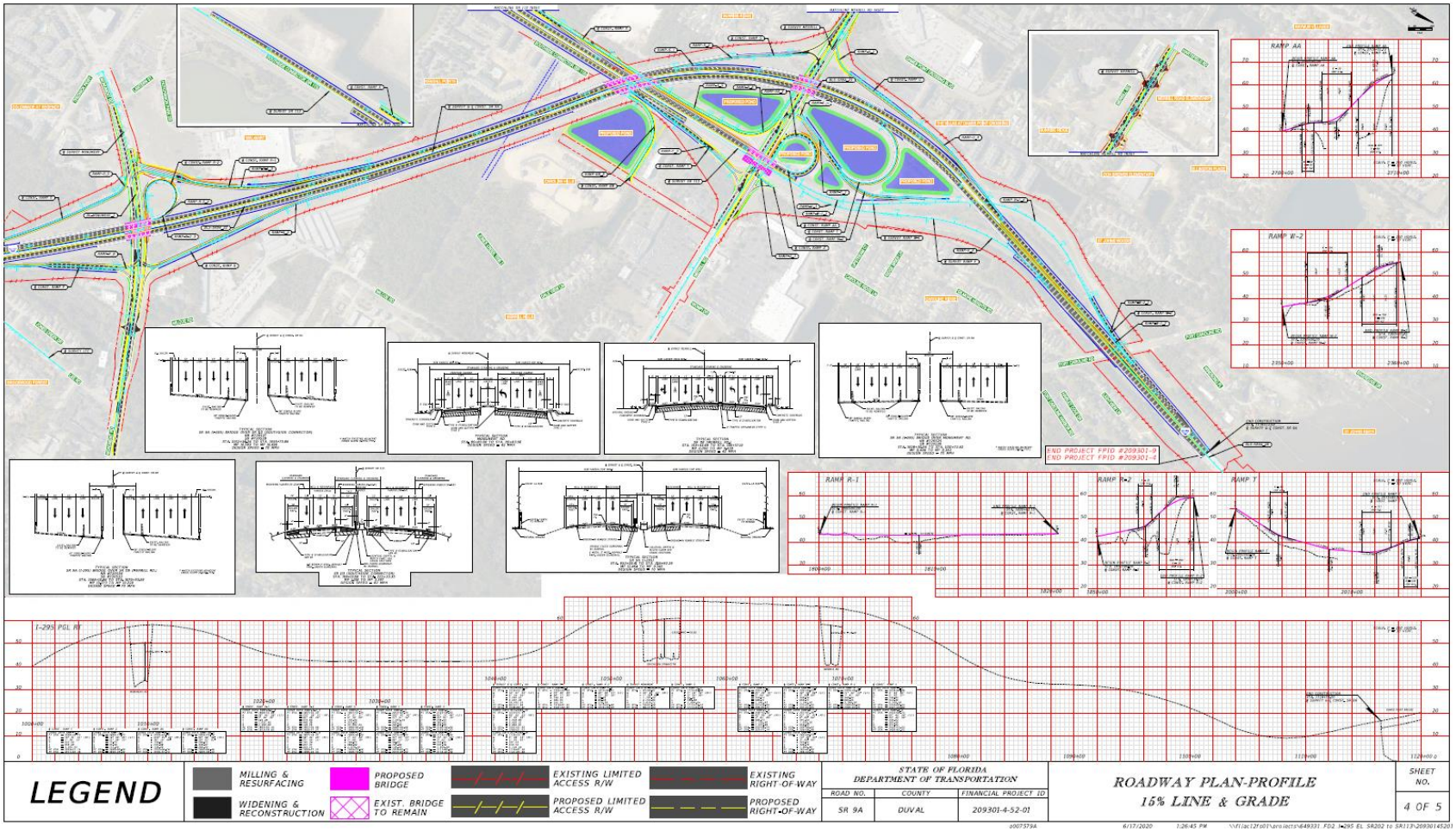
- **Unique to Major Projects**
  - New alignment
  - New interchanges, interchange modification
  - Reconstruction/capacity projects: address base clearance or flooding issues
- **Transition from PD&E Concept Plans to Final Design**
  - Concepts based on 2D aerials
  - 15% Line & Grade based on design survey and geotechnical data
- **Application**
  - Establish minimum base clearance based on seasonal high
  - Establish bridge vertical clearance
  - Establish stopping site distance based on design speeds (horizontal and vertical)

Design Development – 15% Line & Grade

- **Platform for Early Coordination with FDOT Design**
  - 15% Plans Submitted in ERC in Advance of 15% Line & Grade Meeting
  - Opportunity for Review by District Design, Maintenance, Landscape, ROW, Estimates
- **Upper Management Meeting to Verify Concept**
  - Construction Limits
  - Interchange Layout(s)
  - Pond Siting
  - ROW Requirements
  - Bridge Replacement vs Widening or Restriping
  - Variations and Exceptions
  - Construction Cost (updated LRE)



Design Development – 15% Line & Grade



FDOT ACEC

PM ACADEMY

Long Lead Items – Phase Submittals

Gaelan Bishop, P.E.
Atkins
GEC – Sr. Project Manager

Long Lead Time – Right of Way

- **Identify Requirements**
  - Prepare initial relocation study (PD&E)
  - FDM Chapter 113
- **Prepare Maps**
  - Complete title search
  - Prepare legal descriptions
  - Prepare parcel requirements
- **Acquisition**

Map Preparation

Joe Losaria, P.E.
Patel, Greene & Associates (PGA)
VP/Principal, Structures Group Manager

Control Survey Maps:

- **Control Survey Maps**
  - **Schedule a kickoff meeting with District Mapping**
  - **Control Maps**
    - Refer to FDOT Surveying and Mapping Procedure (Topic No. 550-030-101-d)
    - Similar submittal process – 60%, 90%, 100%
    - Provides horizontal position data for the support of right of way related maps
    - Contents of R/W Control Maps

27.1.1. GENERAL MAP REQUIREMENTS

The map or digital file will depict, at a minimum, the following:

- The survey alignment with reference points
- Sufficient land line ties
- Recorded subdivisions, condominiums, and cooperatives along with recording data
- A north arrow and scale of map when a hardcopy map is produced
- County and state lines unless excepted by the DSMO
- City names with city limits unless excepted by the DSMO
- State, county, or municipal roads intersecting the survey alignment
- The bearing basis
- The source of dimensions: Field (F), Plat (P), Deed (D), Calculated (C)
- Sufficient general notes on sheet 1 or in the survey report
- The Department standard title block when a hardcopy map is produced
- A legend of abbreviations and symbols
- Found monumentation

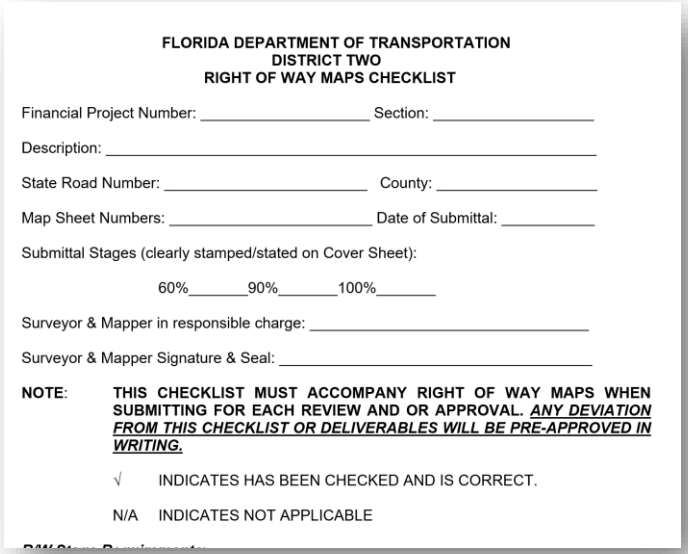
Refer to 27.1.1 of FDOT Surveying and Mapping Handbook

Right of Way Map:

- **R/W Concepts Meeting – held prior to 60% maps preparation**
- **Funding of R/W acquisition can drive schedule**
- **R/W Maps**
  - 268 Date – why is it important?
    - Date to submit 100% R/W maps and parcel packages to R/W
    - Begins R/W Appraisals, acquisition and R/W certification

Activity	Description	Person Responsible	Start Date (A=Actual)		Finish Date (A=Actual)		Remaining Days	Total Float
140040000	Review 100% R/W Maps and Descriptions	MP	9/30/2020	A	10/13/2020	A		
144010000	Prepare Initial Parcel Packages	MP	9/30/2020	A	10/22/2020	A		
268010000	SUBMIT 100% R/W MAPS AND PARCEL PACKAGES TO R/W	MP	10/22/2020	A	10/22/2020	A		

  - Similar submittal process – 60%, 90%, 100%
  - Required information at each milestone:
    - Utilize D2 R/W Maps Checklist:
      - 60%
      - 90%
      - 100%
  - Verify if Maintenance Maps are needed



FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT TWO
RIGHT OF WAY MAPS CHECKLIST

Financial Project Number: _____ Section: _____

Description: _____

State Road Number: _____ County: _____

Map Sheet Numbers: _____ Date of Submittal: _____

Submittal Stages (clearly stamped/stated on Cover Sheet):

60%_____90%_____100%_____

Surveyor & Mapper in responsible charge: _____

Surveyor & Mapper Signature & Seal: _____

NOTE: THIS CHECKLIST MUST ACCOMPANY RIGHT OF WAY MAPS WHEN SUBMITTING FOR EACH REVIEW AND OR APPROVAL. ***ANY DEVIATION FROM THIS CHECKLIST OR DELIVERABLES WILL BE PRE-APPROVED IN WRITING.***

√ INDICATES HAS BEEN CHECKED AND IS CORRECT.

N/A INDICATES NOT APPLICABLE

Long Lead Time – Right of Way

- **ROW Acquisition**
  - Approximate Timeline (2 years)
  - Must have NEPA approval (National Environmental Policy Act)
  - Relocation Needs/Assessment Study
  - Appraisal contracts & appraisal preparation and review
  - Initial offers and relocation notices
  - Good faith negotiations or suit (order of taking)
  - Vacate notices
  - Asbestos testing
  - Right of Way Certified

Long Lead Time – Right of Way

- **License Agreements**
  - Not part of the acquisition process
  - Documents prepared/approved by FDOT legal and signed by the owner

- **TIITF Easements (Trustees of the Internal Improvement Trust Fund)**
  - Requires a legal sketch and description
  - Is approved by FDEP
  - Uplands – Submitted by FDOT
  - Sovereign Submerged Lands – Submitted by WMD

Long Lead Time – Utility Coordination

- FGT (Florida Gas Transmission)
- JPA Funding
- Conflict Avoidance
- 90% Certification
- Late changes after 90% or 100% plans
- Short staffed UAO's
- SUE – Subsurface Utility Engineering
- Offsets/Aerial Constructability

Long Lead Time – Permitting

- **404 Permits FDEP/USACE**
  - FDEP assumed most responsibilities from USACE
  - Dredge and fill in wetlands or surface waters
  - No permit timeline or review clock

Long Lead Time – Permitting

- Flood plan compensation
- Potential change in EPA Clean Water Rule
- USCG

Long Lead Time – Railroad Coordination

- **Determine the project's rail involvement**
- **Common plan requirements**
  - Label the railroad right of way
  - Label the crossings
  - Include railroad specific notes
  - Label dimensions from the centerline of tracks to:
    - Railroad right of way
    - Work limits
- **Verify if a Special Provision for insurance is needed**
- **Coordinate with the rail office no later than 60% plans for review by the railroad. Larger plan sets should coordinate earlier.**
- **The railroad review time is 45 days**

Long Lead Time – Railroad Coordination

- **Things to watch out for inside railroad right of way**
  - Limits of milling and resurfacing for the at grade crossing
  - Excess soils
  - MSE Wall
  - Drainage
  - Access
  - Future track expansion
  - Crash walls
  - Contract time
  - Pile extraction/conflicting piles
  - Railroad warning devices
  - Signal interconnect
  - Sidewalks/Multiuse Path
  - Railroad flagging
  - Crossing footprint changes
  - Wirelines over or under the railroad right of way
  - Dynamic envelop

Phase Submittals

- **ERC**
  - Module 3
  - Gatekeeping
  - ERC Checklists
- **PS&E Submittals**
- **QDI Grading System (Quality Delivery Indicator)**
  - Scoring Criteria
  - Process & Performance

Phase Submittals - QDI Scoring Criteria

- **Timeliness of Delivery**
- **Number of plan and spec package review comments**
- **Projects are determined to be “simple” or “complex” via numerous factors for points being assigned to comments:**
  - Two or more strung projects
  - Includes goes with Utility plans
  - Number of special provisions (MSP, TSP or Developmental Specs are used)
  - Number of Components
- **Accuracy of Change Memo(s) between plan submittal**
- **Number of re-submittals necessary beyond PS&E #2 because of rejection**

Phase Submittals - Scoring Criteria

First submittal of FINAL PLANS (PS&E No. 1 Submittal)

Simple project - Per review comment	-0.6 pts
Complex project - Per review comment	-0.5 pts

Next submittal of FINAL PLANS (PS&E 2)

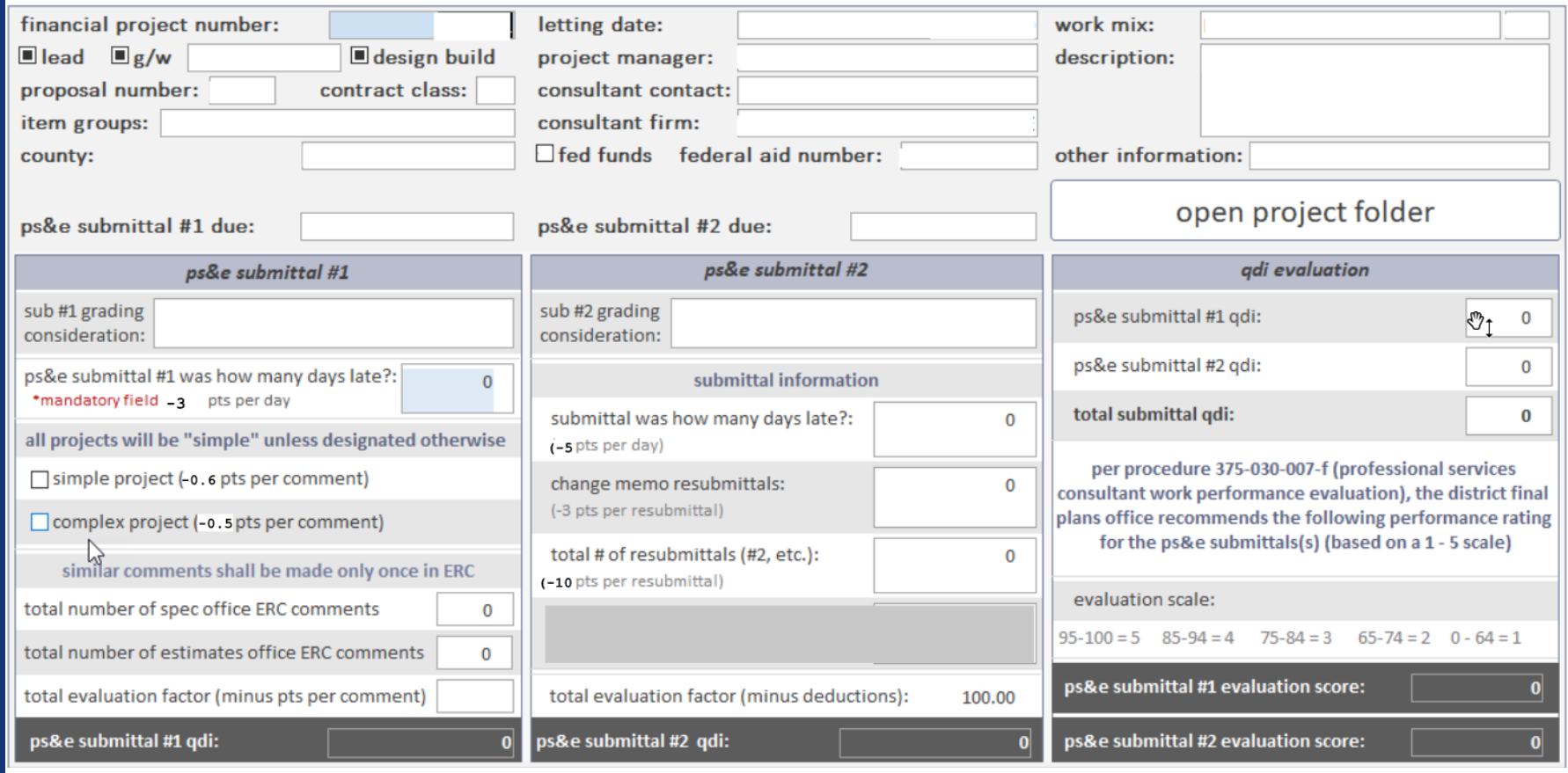
Resubmittal of plans for errors	-10.0 pts
Errors in the Change Memo	-3.0 pts

Final Score = Average of PS&E Scores on a 100-point scale

Converted to a 5 Point Scale

PS&E #1 SUBMITTAL QDI:		PS&E #2 (ETC) SUBMITTAL QDI:		
				Average PS&E QDI:
QDI EVALUATION				
0 - 64 = 1	65 - 74 = 2	75 - 84 = 3	85 - 94 = 4	95 - 100 = 5
				Total PS&E QDI Evaluation Score:

Phase Submittals - Process & Performance



FDOT ACEC

PM ACADEMY

Component Plans

Colette Moss, P.E.
DRMP
Vice President

Component Sets

- List of components (FDM 302.5) include:

302.5 Contract Plans Set Components

The Contract Plans Set is typically assembled as component plans that are associated with a primary work type. Roadway plans are typically the lead component of the contract plans. Provide a list of all component plans included in the contract plans in the upper left corner of the lead component Key Sheet in the following order:

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

Utility Work by Highway Contractor Agreement Plans have a separate Financial Project ID and are typically treated as a strung project. See ***FDM 302.11*** for additional information on Strung Projects. When utility work is minimal, the District may decide to include these plans as a component set to the lead plans set.

Another component (e.g., structures, signals, landscaping), may become the lead component when there are no roadway plans. Any sheets incidental to the project typically found within the roadway plans may be included in the lead component plans and numbered consecutively.

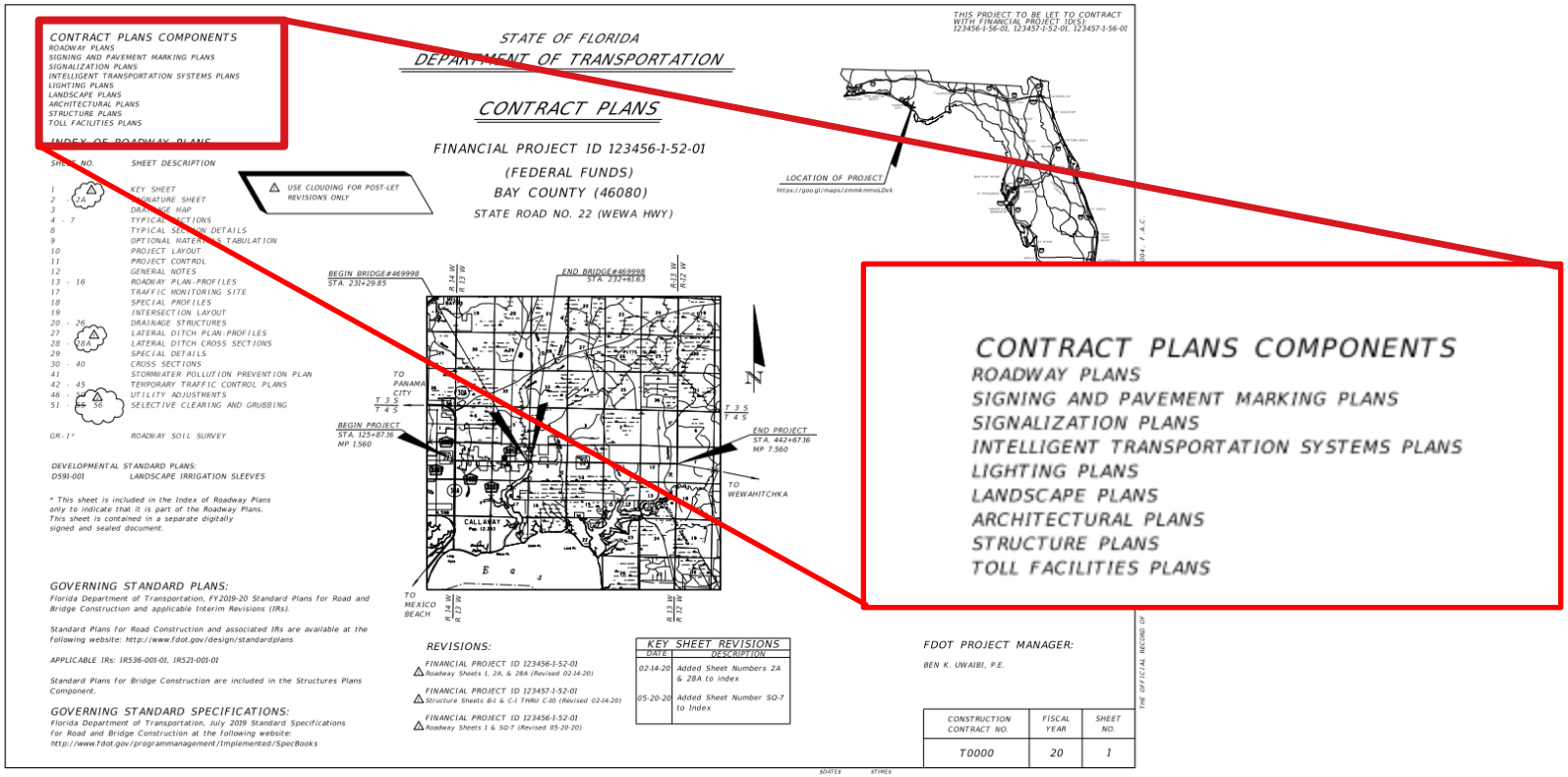
Scope Requirements

- Understand what goes into the plan components per the scope document.

TABLE OF CONTENTS

Component Sets

- Lead Component will list all construction plan components
- List of components in upper left corner of Key Sheet:



Roadway Component

Scope Requirements

- Understand what goes into the plan components per the scope document.

5 ROADWAY PLANS *(AS NEGOTIATED)*

The CONSULTANT shall prepare Roadway, TTCP, Utility Adjustment Sheets, plan sheets, notes, and details. The plans shall include the following sheets necessary to convey the intent and scope of the project for the purposes of construction.

5.1 Key Sheet

5.2 Summary of Pay Items Including Quantity Input

5.3 Typical Section Sheets

5.3.1 Typical Sections

5.3.2 Typical Section Details

5.4 General Notes/Pay Item Notes

5.5 Summary of Quantities Sheets

5.6 Project Layout

5.7 Plan/Profile Sheet

A-34

Roadway Component

- **Roadway Plan Requirements (FDM 302-322 / 910-924):**
  - See Scope and Fee for NextGen Requirements (900 series if applicable)

302.6 Index of Roadway Plans

Place an index of roadway sheets on the left side of the Key Sheet. Each component Key Sheet will have an index of sheets contained in that component. Assemble roadway plans in the following order:

(1) Key Sheet
(2) Signature Sheet
(3) Drainage Map
(4) Interchange Drainage Map
(5) Typical Section
(6) Optional Materials TabulationProject Layout
(7) Project Control
(8) General Notes
(9) Roadway Plan and Profiles
(10) Traffic Monitoring Site
(11) Special Profiles
(12) Back-of-Sidewalk Profiles
(13) Interchange Layout
(14) Ramp Terminal Details
(15) Intersection Layout/Detail
(16) Drainage Structures
(17) Outfall/Lateral Ditch Plan and Profiles
(18) Outfall/Lateral Ditch Cross Sections
(19) Special Details
(20) Cross Section Pattern
(21) Roadway Soil Survey
(22) Cross Sections
(23) Stormwater Pollution Prevention Plans (SWPPP)
(24) Temporary Traffic Control Plans
(25) Utility Adjustments
(26) Selective Clearing and Grubbing
(27) Tree Disposition Plan
(28) Developmental Standard Plans

Plan Component Requirements by Phase

- FDM Table 301.2.2 lists general requirements for all projects
- Some projects require additional plan items not depicted within the FDM
- Outside of the Roadway component plan items, other component plan items are not detailed. See Scope/Fee.

Topic #625-000-002
FDOT Design Manual — January 1, 2022

Table 301.2.2 Summary of Phase Submittals

Provide the sheets listed as applicable

ITEM	PHASE I	PHASE II*	PHASE III	PHASE IV
Key Sheet	P	P	C	F
Signature Sheet		P	C	F
Drainage Map	P	P	C	F
Interchange Drainage Map	P	P	C	F
Typical Section	P	C	C	F
Optional Materials Tabulation		P	C	F
Project Layout	P	C	C	F
Project Control	P	C	C	F
Roadway Plan and Profile	P	P	C	F
Traffic Monitoring Site		P	C	F
Special Profile	P	P	C	F
Back-of-Sidewalk Profile	P	C	C	F
Interchange Layout	P	P	C	F
Ramp Terminal Details		P	C	F
Intersection Layout/Detail	P	P	C	F
Drainage Structures		P	C	F
Outfall/Lateral Ditch Plan-Profile		P	C	F
Outfall/Lateral Ditch Cross Section		P	C	F
Retention/Detention Ponds		P	C	F
Cross Section Pattern		P	C	F
Roadway Soil Survey		P	C	F
Cross Sections	P	P	C	F
Stormwater Pollution Prevention Plan		P	C	F
Temporary Traffic Control Plans	P	P	C	F
Utility Adjustments		P	C	F
Selective Clearing and Grubbing		P	C	F
Mitigation Plans		P	C	F
Miscellaneous Structures Plans		P	C	F
Signing and Pavement Marking Plans		P	C	F
Signalization Plans		P	C	F
Intelligent Transportation System (ITS) Plans		P	C	F
Lighting Plans		P	C	F
Landscape Plans	P	P	C	F
Landscape Opportunity Plans	P	P	C	F
Tree Disposition Plans	P	P	C	F
Utility Work by Highway Contractor Agreement Plans			C	F
Developmental Standard Plans		C	C	F
Toll Facility Plans				
Site/Civil	P	P	C	F
Architectural	P	P	C	F
Structural	P	P	C	F
Electrical		P	C	F
Mechanical		P	C	F
Plumbing		P	C	F
Communications	P	C	F	
Systems		P	C	F

Status Key: P - Preliminary C - Complete but subject to change F - Final

** Projects with structures plans component must submit the latest set with the 60% roadway submittal.*

Plan Component Requirements by Phase

Topic #625-000-002
FDOT Design Manual
January 1, 202

Table 301.2.2 Summary of Phase Submittals

Provide the sheets listed as applicable

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Interchange Drainage Map	P	P	C	F
Typical Section	P	C	C	F
Optional Materials Tabulation		P	C	F
Project Layout	P	C	C	F
Project Control	P	C	C	F
Roadway Plan and Profile	P	P	C	F
Traffic Monitoring Site		P	C	F
Special Profile	P	P	C	F
Back-of-Sidewalk Profile	P	C	C	F
Interchange Layout	P	P	C	F
Ramp Terminal Details		P	C	F
Intersection Layout/Detail	P	P	C	F
Drainage Structures		P	C	F
Outfall/Lateral Ditch Plan-Profile		P	C	F
Outfall/Lateral Ditch Cross Section		P	C	F
Retention/Detention Ponds		P	C	F
Cross Section Pattern		P	C	F

Plan Component Requirements by Phase

Signing and Pavement Marking Plans		P	C	F
Signalization Plans		P	C	F
Intelligent Transportation System (ITS) Plans		P	C	F
Lighting Plans		P	C	F
Landscape Plans	P	P	C	F
Landscape Opportunity Plans	P	P	C	F
Tree Disposition Plans	P	P	C	F
Utility Work by Highway Contractor Agreement Plans			C	F
Developmental Standard Plans		C	C	F
Toll Facility Plans				
Site/Civil	P	P	C	F
Architectural	P	P	C	F
Structural	P	P	C	F
Electrical		P	C	F
Mechanical		P	C	F
Plumbing		P	C	F
Communications	P	C	F	
Systems		P	C	F

Status Key: P - Preliminary C - Complete but subject to change F - Final

** Projects with structures plans component must submit the latest set with the 60% roadway submittal.*

Plan Component Requirements by Phase

- **FDM Table 301.2.1**
  - Phase submittals element requirements

301.2.1 Phase I Submittal

Unless otherwise directed by the Department, the following elements are required for a Phase I set of plans:

KEY SHEET

- Location Map with location of project on map
- All applicable Financial Project IDs
- (Federal Funds) notation, if applicable
- Exceptions & Equations
- County Name
- State Road Number
- North arrow
- Approval signature lines
- Railroad crossing (if applicable)
- Revision box
- Governing Standards & Specifications dates
- Department's Project Manager's Name
- Begin & end project station and begin mile post
- Begin & end bridge stations
- Consultant's name, address, contract number, and vendor number (if applicable)

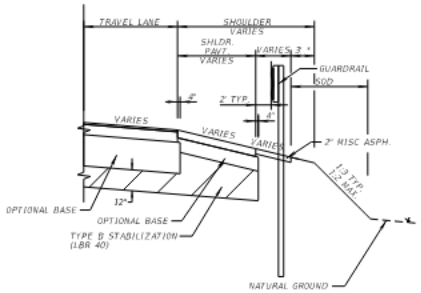
DRAINAGE MAP - PLAN VIEW

- North arrow and scale
- Drainage divides and ground elevations
- Drainage areas and flow direction arrows
- Equations
- High water information as required
- Preliminary horizontal alignment
- Section, township, range lines
- Street names
- Begin & end stations of project, construction, bridge, bridge culverts & exceptions
- Existing structures & pipes with relevant information
- State, Federal, county highway numbers (as appropriate)

Roadway Component

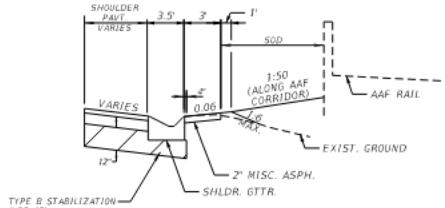
- **Coordination is Required for:**
  - Maintaining Agencies (FDOT, County, City, WMD, Other Water Districts, RR, FAA, etc)
  - Adjacent Projects (interface, alignments, TTCP, drainage)
  - Drainage elements (Pond sites, special drainage ditch profiles and special gutter profiles)
  - Safety elements (Complete Streets, ADA)
  - Longitudinal barriers for Signing, Signals, Lighting, ITS and Tolling equipment protection
  - Geotechnical (soils materials, muck limits, requirements for surcharge)
  - Structural elements (Bridge, Wall, Foundation construction)
  - Landscape opportunities within open areas
  - Aesthetics
  - Utility construction and adjustments
  - Temporary Traffic Control Phasing (Lane Closures restrictions, pedestrian and vehicle detours, temporary critical walls, temporary drainage structures, Detours)
  - Right of Way limits

Special Details



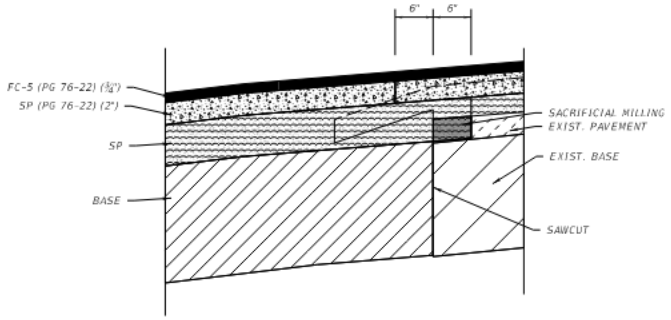
GUARDRAIL DETAIL

SEE PLANS, PROFILES, AND CROSS SECTIONS FOR ADDITIONAL INFORMATION
* UNPAVED SHOULDER 1' WIDE FOR:
RAMP B-1 STA. 55+50.00 TO 60+50.00 LT. &
RAMP G-8 STA. 2830+00.00 TO STA. 2833+76.46 RT.



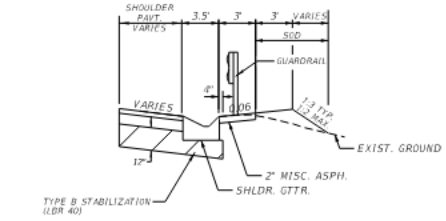
SHOULDER GUTTER WITH MISCELLANEOUS ASPHALT DETAIL

NOTES: 1. WHEN SHOULDER PAVEMENT IS ADJACENT TO SHOULDER GUTTER AND < 6' IN WIDTH, THE PAVEMENT DESIGN AND SLOPE SHALL MATCH THE TRAVEL LANE.
2. SEE PLANS FOR TRENCH DRAIN LIMITS. WORK WITH TRENCH DRAIN DETAILS.



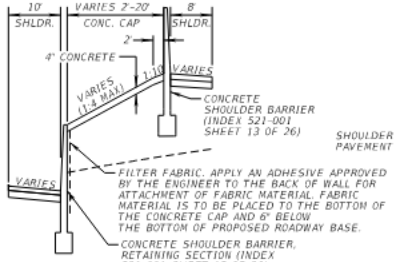
OUTSIDE WIDENING PAVEMENT JOINT DETAIL

APPLIES AT ALL WIDENING SECTIONS



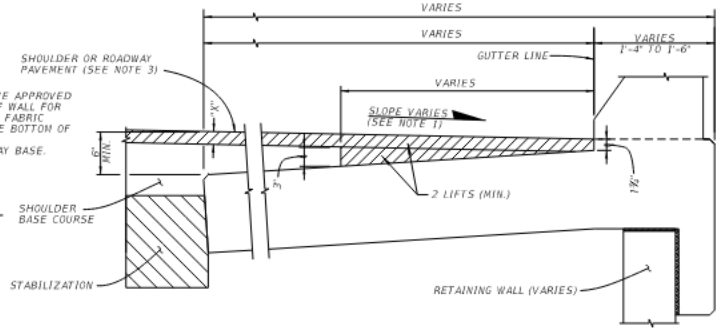
SHOULDER GUTTER WITH GUARDRAIL DETAIL

SEE PLANS, PROFILES, AND CROSS SECTIONS FOR ADDITIONAL INFORMATION



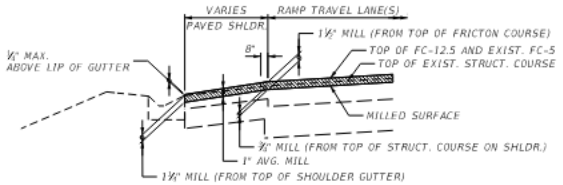
SHOULDER WALL CONCRETE CAP DETAIL

SR 436 NB STA. 34+84.07 TO STA. 36+59.46
RAMP C-2 STA. 3092+25.93 TO STA. 3093+97.77



SHOULDER PAVEMENT THRU JUNCTION SLAB DETAIL

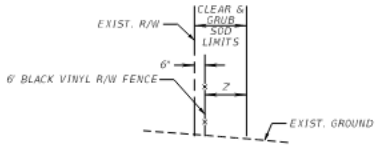
NOTES:
1. MATCH CROSS SLOPE OF TRAVEL LANE OR SHOULDER.
2. VARY JUNCTION SLAB SLOPE BASED ON SHOULDER CROSS SLOPE TO MAINTAIN A MINIMUM 6" DEPTH AT THE EDGE OF THE SLAB AS SHOWN.
3. TYPICAL SECTION IS INTENDED TO DESCRIBE PAVEMENT ONLY. SEE STRUCTURAL PLANS FOR WALL DESIGNS AND ADDITIONAL INFORMATION.
4. "X" IS THE NORMAL SHOULDER PAVEMENT THICKNESS.
5. NO STABILIZATION IS REQUIRED UNDER JUNCTION SLAB.
6. SHOULDER BASE IS PAID FOR AS SY, MEASURED TO THE GUTTER LINE.
7. SHOULDER STRUCTURAL COURSE IS A FIELD ADJUSTED QUANTITY, PAID PER TN.
8. ENSURE MSE WALL SOIL REINFORCING IS PLACED A MINIMUM OF 2' BELOW THE STABILIZED SUBBASE.



SHOULDER PAVEMENT WITH SHOULDER GUTTER

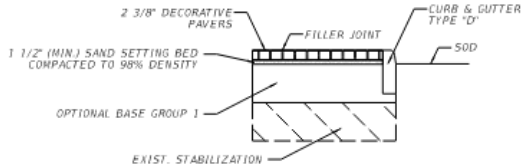
SHOULDER GUTTER SHOWN, EXISTING BARRIER WALL SIMILAR

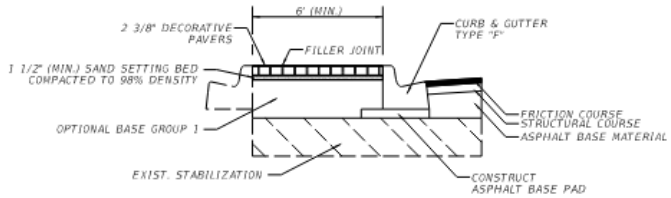
SEE INDEX 425-031 (SHEET 1 OF 2) FOR PAVEMENT WARP AT EXISTING BARRIER INELTS



R/W FENCE DETAIL IN LOCATIONS OF REPLACEMENT

Special Details

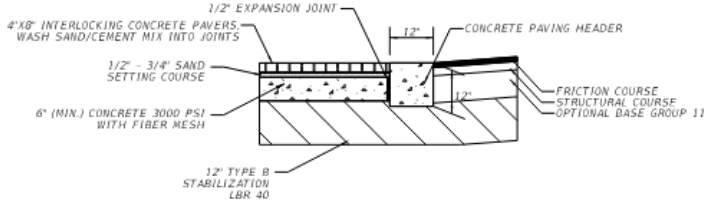




ARCHITECTURAL PAVERS (MEDIAN) DETAIL

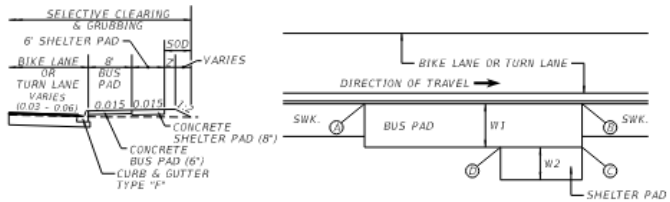
STA. 36+97.53 TO STA. 39+00.00

NOTES:
1. COLOR AND PAVER TYPE TO MATCH EXISTING.
2. BEDDING SAND TO BE BROOMED IN BETWEEN BRICKS IN FILLER JOINT.
3. ALL PAVERS TO BE INSTALLED FLUSH WITH TOP OF CURB.
4. COLORING OR DYE TO BE UNIFORM THROUGHOUT EACH CONCRETE PAVER UNIT. DIPPED OR EXTERNALLY COLORED PAVER UNITS ARE UNACCEPTABLE.
5. INSTALL PAVERS WITH EDGE RESTRAINT AND CONFINED WITH CURBS.
6. FINAL FINISHED SURFACE TO BE UNIFORM ELEVATION OR SLOPE.



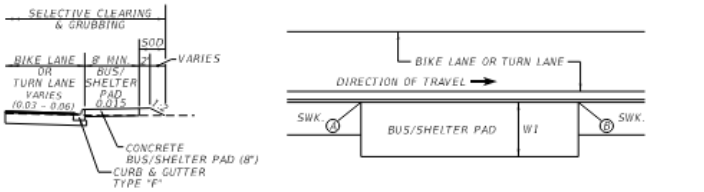
ARCHITECTURAL PAVERS (DRIVEWAY) DETAIL

NOTE: 1. PATTERN, COLOR, AND PAVER TYPE TO MATCH EXISTING.



BUS AND SHELTER PAD DETAIL

NOTE: 1. SEE TABLE BELOW FOR LOCATIONS AND DIMENSIONS.



BUS AND SHELTER PAD COMBINED DETAIL

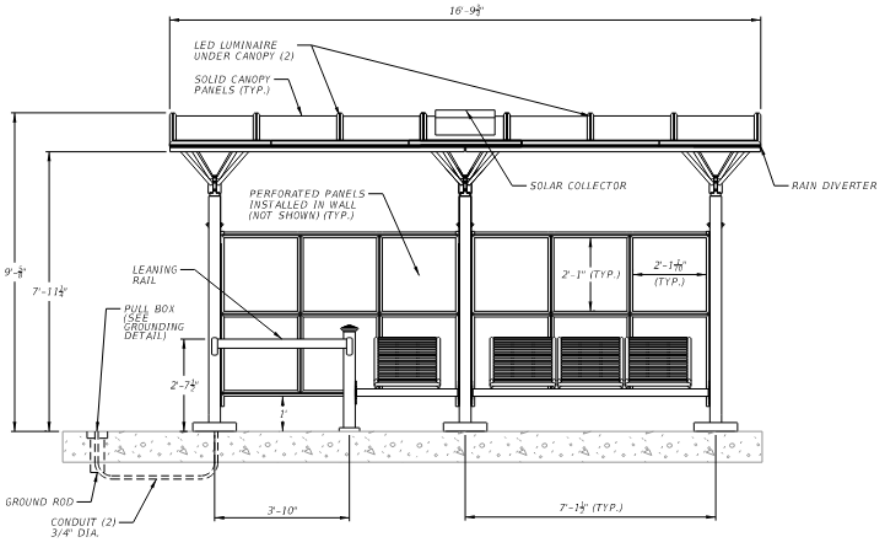
NOTE: 1. SEE TABLE BELOW FOR LOCATIONS AND DIMENSIONS.

BUS AND SHELTER PAD DIMENSIONS

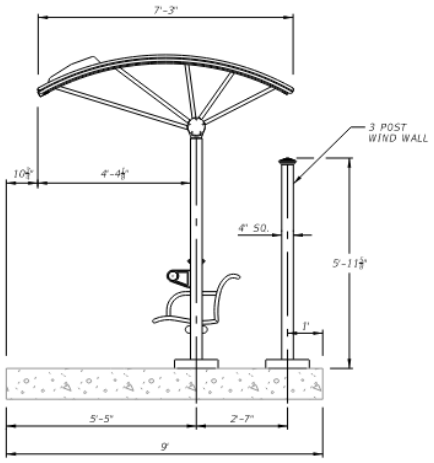
#	DIRECTION OF TRAVEL	W1 (FT)	A (STA.)	B (STA.)	W2 (FT)	C (STA.)	D (STA.)	BUS STOP I.D. #
1	NB	8	37+25.00	37+65.00	6	37+65.00	37+50.00	2358
2	SB	8	48+20.00	47+80.00	N/A	N/A	N/A	2565
3	NB	8	50+02.00	50+42.00	N/A	N/A	N/A	2514
4	SB	10	61+40.00	61+00.00	N/A	N/A	N/A	2562
5	NB	8	65+00.00	65+40.00	6	65+40.00	65+20.00	2838
6	SB	8	67+95.00	67+55.00	6	67+55.00	67+70.00	2548
7	NB	8	80+75.00	81+15.00	N/A	N/A	N/A	2839
8	SB	8	81+15.00	80+75.00	6	80+75.00	80+90.00	2518
9	SB	8	91+40.00	91+00.00	6	91+00.00	91+15.00	2516
10	SB	8	100+45.00	100+05.00	6	100+05.00	100+20.00	5520
11	NB	8	100+65.00	101+05.00	6	101+05.00	100+90.00	2854

Special Details

- Coordination with maintaining agencies & counties for custom requirements required to be shown in plans
- Include detail notes for construction as well as pay item notes for how to pay for items not included within the BOE and specifications



Bus Shelter Detail Elevation View



Bus Shelter Detail Side View

Signing and Pavement Markings Component

Signing and Pavement Markings Component

- S&PM Plan requirements (FDM 325)

325.2 Key Sheet

The Key Sheet is the first sheet in the component plans set. The location map and Contract Plans Components list are not required on this sheet. Show the Index of S&PM Plans on the left side of the sheet. Assemble S&PM plans in the following order:

(1) Key Sheet
(2) Signature Sheet (if required)
(3) General Notes (if required)
(4) S&PM Plan
(5) Guide Sign Worksheet (if required)
(6) Overhead Sign Cross Section (if required)
(7) Overhead Sign Support Design (if required)
(8) Foundation Details (if required)
(9) Boring Data (if required)

Signing and pavement marking plans may require insertion of sheets that were prepared early, or prior to the design process; i.e. early works. See ***FDM 302.6.1*** for instructions on including early works sheets.

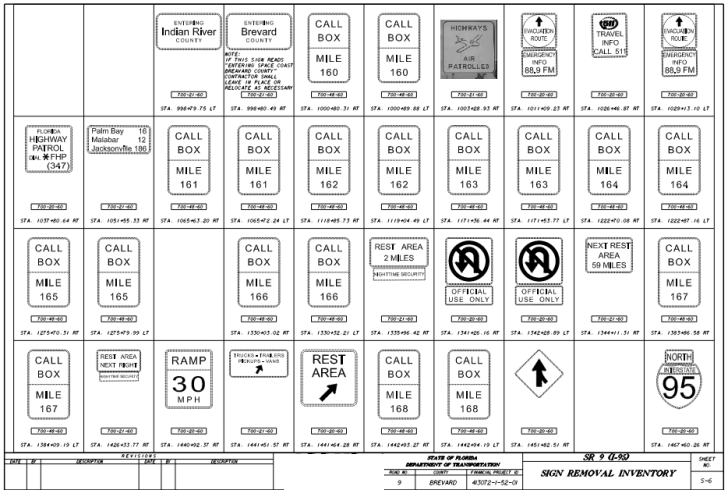
See ***FDM 302*** for other Key Sheet requirements and ***Exhibit 302-3*** as an example Component Key Sheet.

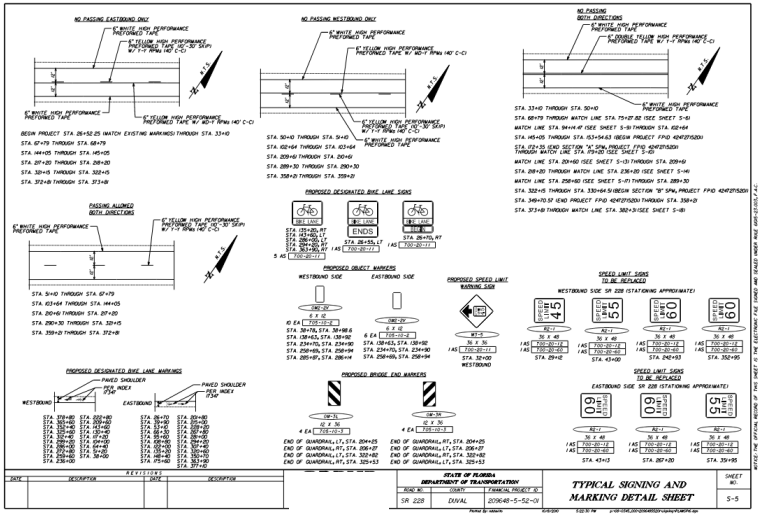
Signing and Pavement Markings Component

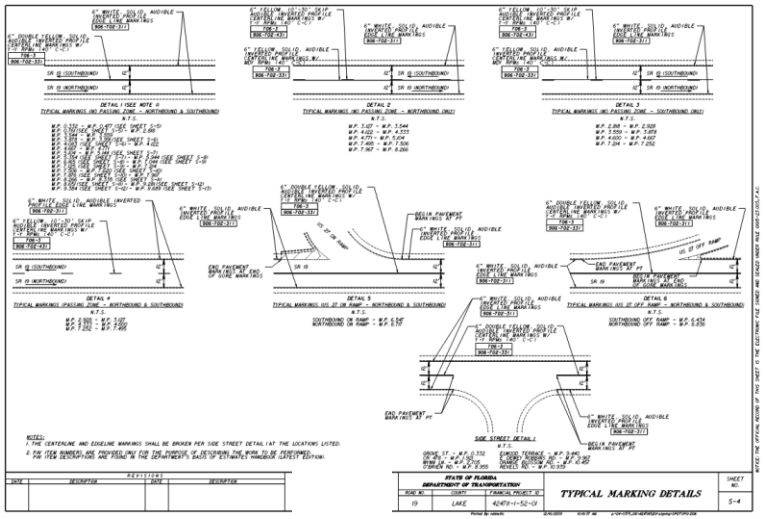
- **Coordination Items:**
  - Agency Coordination
  - Coordination with Roadway
  - Structural Design (Overhead Sign Structures)
  - Geotechnical Borings (Overhead Sign Structures)
  - R/W
  - Spacing of signage with adjacent projects/ existing signs
  - Utility Coordination
  - Sign lighting (Only necessary on sharper curves)

Signing and Pavement Markings Component

- **Special Details**
  - Sample - When you don't have full Plan Sheet Coverage, you may need a detail sheet.
  - Different scenarios throughout the project may require a detail sheet.







Signalization Component

Signalization Component

- **Signalization Plan Sheets (FDM 327):**

327.2 Key Sheet

The Key Sheet is the first sheet in the component plans set. The location map and Contract Plans Components list are not required on this sheet. Show the Index of Signalization Plans on the left side of the sheet. Assemble signalization plans in the following order:

(1) Key Sheet
(2) Signature Sheet (if required)
(3) General Notes
(4) Signalization Plan
(5) Interconnect/Communication Plan
(6) Mast Arm Details
(7) Foundation Details - Mast Arms
(8) Boring Data Sheets- Mast Arms

Signalization plans may require insertion of sheets that were prepared early, or prior to the design process (i.e. early works). See ***FDM 302.6.1*** for instructions on including early works sheets.

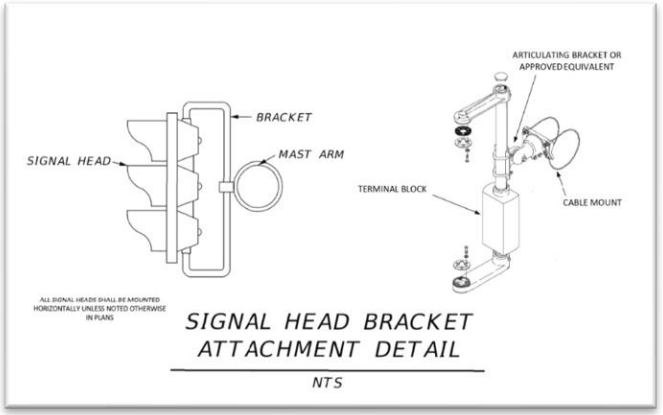
See ***FDM 302*** for other Key Sheet requirements and ***Exhibit 302-3*** as an example Component Key Sheet.

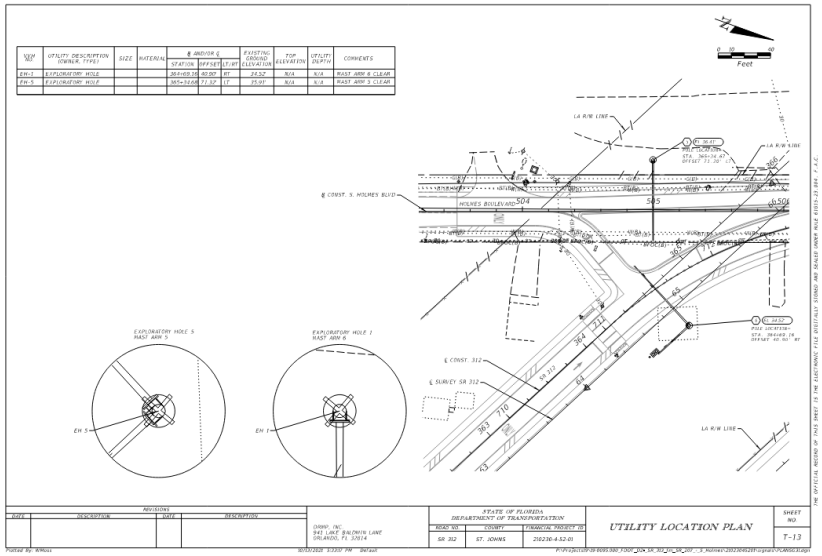
Signalization Component

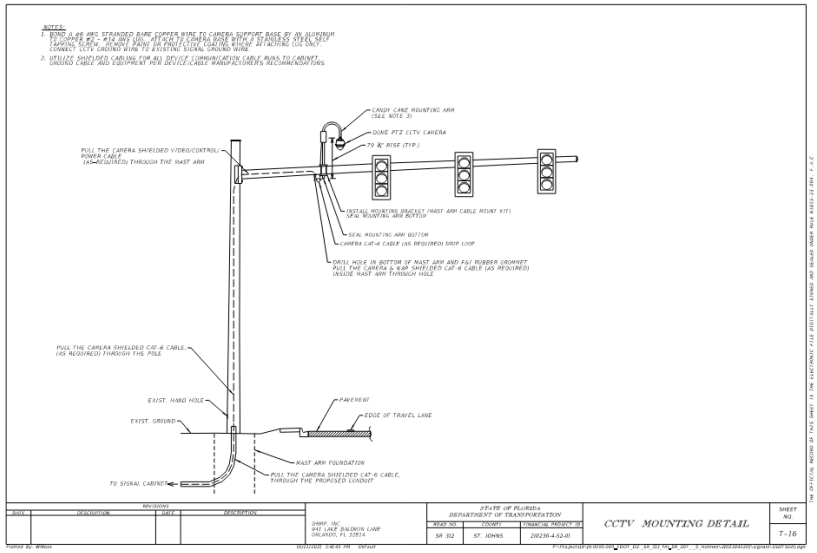
- **Common Coordination Items:**
  - Maintaining Agency Preferences & Coordination
    - Detection Type, Phasing, Controller Manufacturer, Interconnect
  - SUE
    - Large foundations, require clearance holes
  - Location, Right of Way limitations
  - FREE vs. Optimized vs. Coordinated Timings
  - Geotechnical Core Borings
  - Foundation Design

Signalization Component

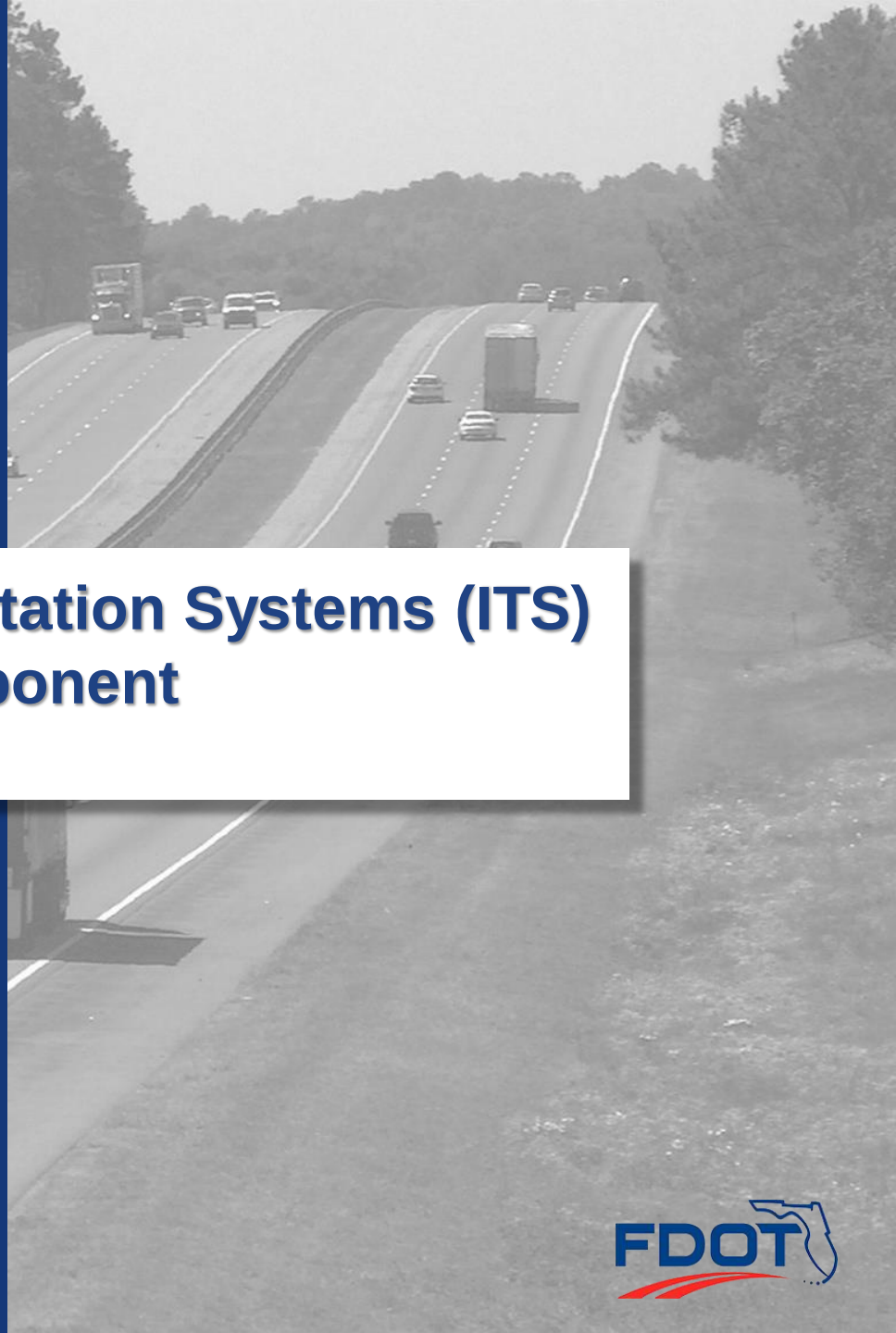
- **Signalization Plan Sheets (FDM 327):**
  - Special Mounting Details
  - Utility Conflict Sheet
  - Miscellaneous Detail Sheets







Intelligent Transportation Systems (ITS) Component



Intelligent Transportation Systems Component

- ITS Plan requirements (FDM 328)

328.2 Key Sheet

The Key Sheet is the first sheet in the component plans set. The location map and Contract Plans Components list are not required on this sheet. Show the Index of ITS Plans on the left side of the sheet. Assemble ITS plans in the following order:

(1) Key Sheet

(2) Signature Sheet (if required)

(3) General Notes

(4) ITS Plan Sheets or "letter type" plan sets

(5) Detail Sheets (as required)

(6) ITS plans may require insertion of sheets that were prepared early, or prior to the design process, i.e., early works. See FDM 302.6.1 for instructions on including early works sheets.

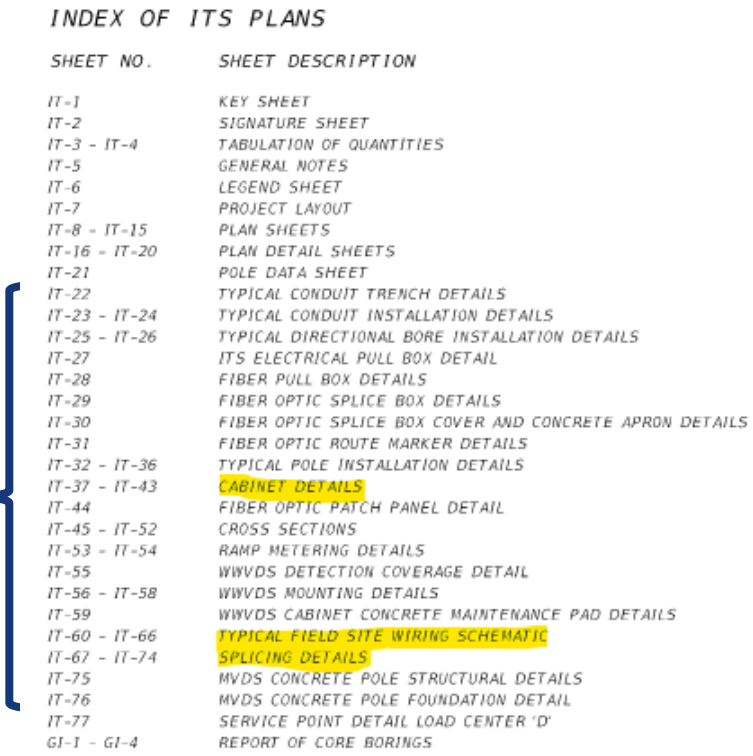
See ***FDM 302*** for other Key Sheet requirements and ***Exhibit 302-3*** as an example Component Key Sheet.

Intelligent Transportation Systems Component

- **Items To Coordinate Often Include:**
  - Power Service Coordination
  - Geotechnical Core Borings for ITS Poles
  - Foundation Design
  - SUE/Utility Coordination
  - Fiber Splicing
  - Vendor Coordination for Specialized ITS Equipment:
    - Intricate Cabinet Detailing
    - Wiring Diagrams
    - Detection Optimization

Intelligent Transportation Systems Component

- **ITS Detail Sheets**
  - Detail Sheets
    - Cabinet
    - Wiring Diagrams
    - Splicing
  - Foundation Details
  - Boring Data
  - Service Point Details
  - Maintenance of Communication Plans

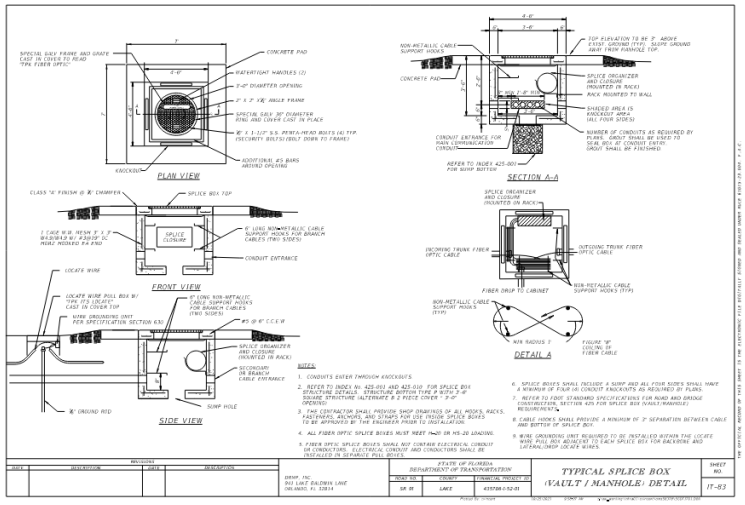


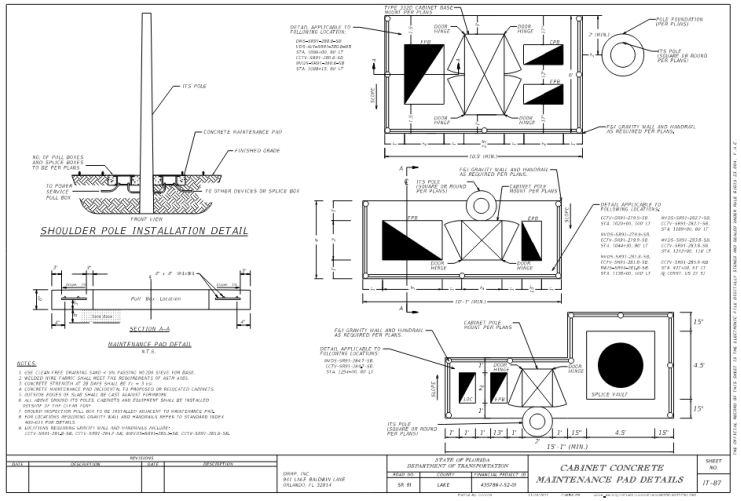
INDEX OF ITS PLANS

SHEET NO.	SHEET DESCRIPTION
IT-1	KEY SHEET
IT-2	SIGNATURE SHEET
IT-3 - IT-4	TABULATION OF QUANTITIES
IT-5	GENERAL NOTES
IT-6	LEGEND SHEET
IT-7	PROJECT LAYOUT
IT-8 - IT-15	PLAN SHEETS
IT-16 - IT-20	PLAN DETAIL SHEETS
IT-21	POLE DATA SHEET
IT-22	TYPICAL CONDUIT TRENCH DETAILS
IT-23 - IT-24	TYPICAL CONDUIT INSTALLATION DETAILS
IT-25 - IT-26	TYPICAL DIRECTIONAL BORE INSTALLATION DETAILS
IT-27	ITS ELECTRICAL PULL BOX DETAIL
IT-28	FIBER PULL BOX DETAILS
IT-29	FIBER OPTIC SPLICE BOX DETAILS
IT-30	FIBER OPTIC SPLICE BOX COVER AND CONCRETE APRON DETAILS
IT-31	FIBER OPTIC ROUTE MARKER DETAILS
IT-32 - IT-36	TYPICAL POLE INSTALLATION DETAILS
IT-37 - IT-43	CABINET DETAILS
IT-44	FIBER OPTIC PATCH PANEL DETAIL
IT-45 - IT-52	CROSS SECTIONS
IT-53 - IT-54	RAMP METERING DETAILS
IT-55	WWVDS DETECTION COVERAGE DETAIL
IT-56 - IT-58	WWVDS MOUNTING DETAILS
IT-59	WWVDS CABINET CONCRETE MAINTENANCE PAD DETAILS
IT-60 - IT-66	TYPICAL FIELD SITE WIRING SCHEMATIC
IT-67 - IT-74	SPLICING DETAILS
IT-75	MVDS CONCRETE POLE STRUCTURAL DETAILS
IT-76	MVDS CONCRETE POLE FOUNDATION DETAIL
IT-77	SERVICE POINT DETAIL LOAD CENTER 'D'
GI-1 - GI-4	REPORT OF CORE BORINGS

Intelligent Transportation Systems Component

- **ITS Detail Sheets**
  - Detail Sheets
    - Cabinet
    - Wiring Diagrams
    - Splicing
  - Foundation Details
  - Boring Data
  - Service Point Details
  - Maintenance of Communication Plans





Lighting Component

Lighting Component

- **Lighting Plan Sheets (FDM 326):**

326.2 Key Sheet

The Key Sheet is the first sheet in the component plans set. The location map and Contract Plans Components list are not required on this sheet. Show the Index of Lighting Plans on the left side of the sheet. Assemble lighting plans in the following order:

(1) Key Sheet

(2) Signature Sheet (if required)

(3) General Notes (if required)

(4) Lighting Data Table and Legend

(5) Lighting Plan

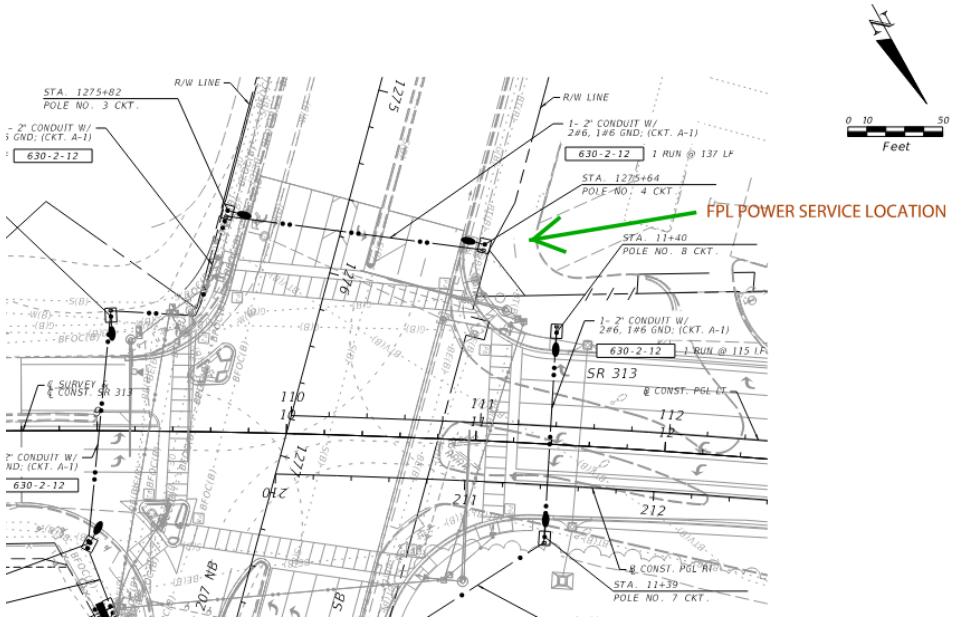
(6) Foundation Details - High Mast (if required)

(7) Boring Data - High Mast (if required)

Lighting plans may require insertion of sheets that were prepared early, or prior to the design process; i.e. early works. See ***FDM 302.6.1*** for instructions on including early works sheets.

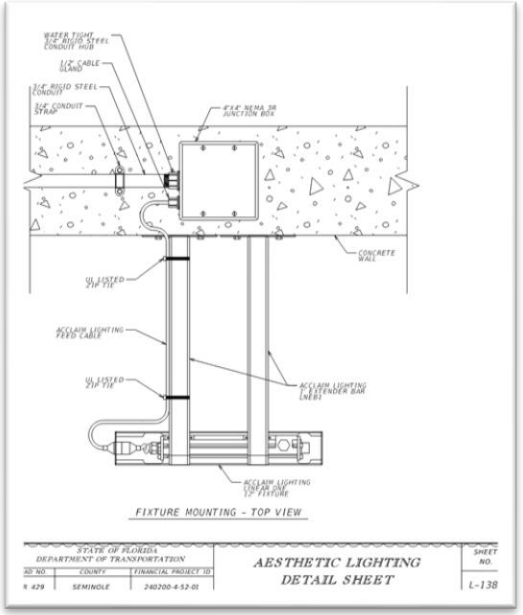
Lighting Component

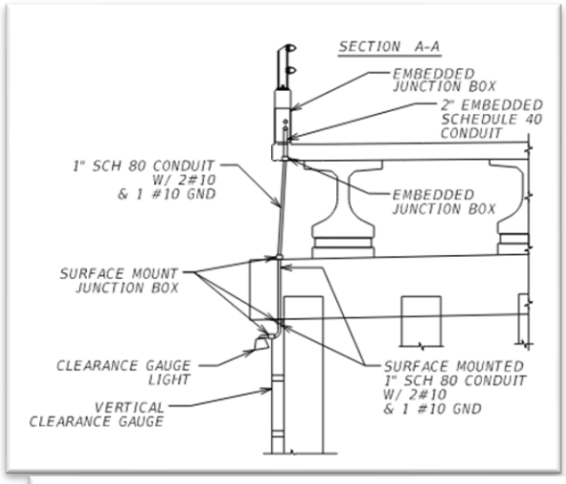
- **Common Coordination Items:**
  - Maintaining Agency Preferences
  - Power Service Coordination
  - FDOTree
  - FAA Restrictions
  - Electrical Design
  - Geotechnical Core Borings
  - Special Foundation Design
  - SUE/Utility Coordination
  - Local Utility/Power Company Owned/Maintained Lighting



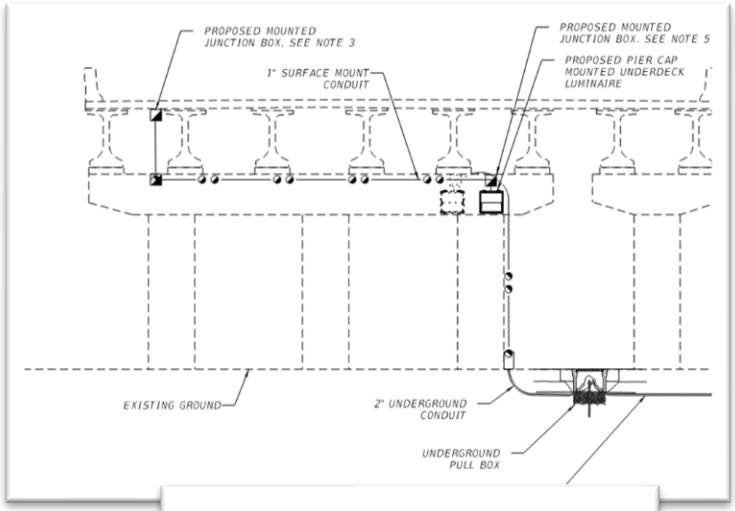
Lighting Component

- **Lighting Plan requirements (FDM 326)**
  - Special Details:
    - Underdeck Mounting Details
    - Sign Lighting Details
    - Navigation Lighting Details
    - Aesthetic Lighting Details





TYPICAL CHANNEL LIGHT MOUNTING
ELEVATION NORTHBOUND BRIDGE NO. 570191
N.T.S.



UNDERDECK LIGHTING DETAIL
TYPICAL UNDERDECK LIGHTING DETAIL
SR 9A OVER SR 15 BRIDGES

Landscaping Plans

Landscaping Component

- **Key Items to review prior to developing landscaping plans:**
  - Stand Alone Plans
  - Landscaping Plans as part of the Contract Plans Set

Landscaping Component

- **Landscaping Plan requirements (FDM 329)**
  - Component of plans set

The key sheet is the first sheet in the component plans set, or a Standalone Landscape plan set. When used as a component set of plans, the location map and Contract Plans Components list are not required on this sheet. Show the index of Landscape Plans on the left side of the sheet. Assemble the Landscape Plans in the following order:

(1) Key Sheet
(2) Signature Sheet (if required)
(3) General Notes
(4) Plant Schedule
(5) Project Layout
(6) Landscape Plan
(7) Landscape Details
(8) Irrigation Plan (if applicable)
(9) Irrigation Details (if applicable)

Landscaping Component

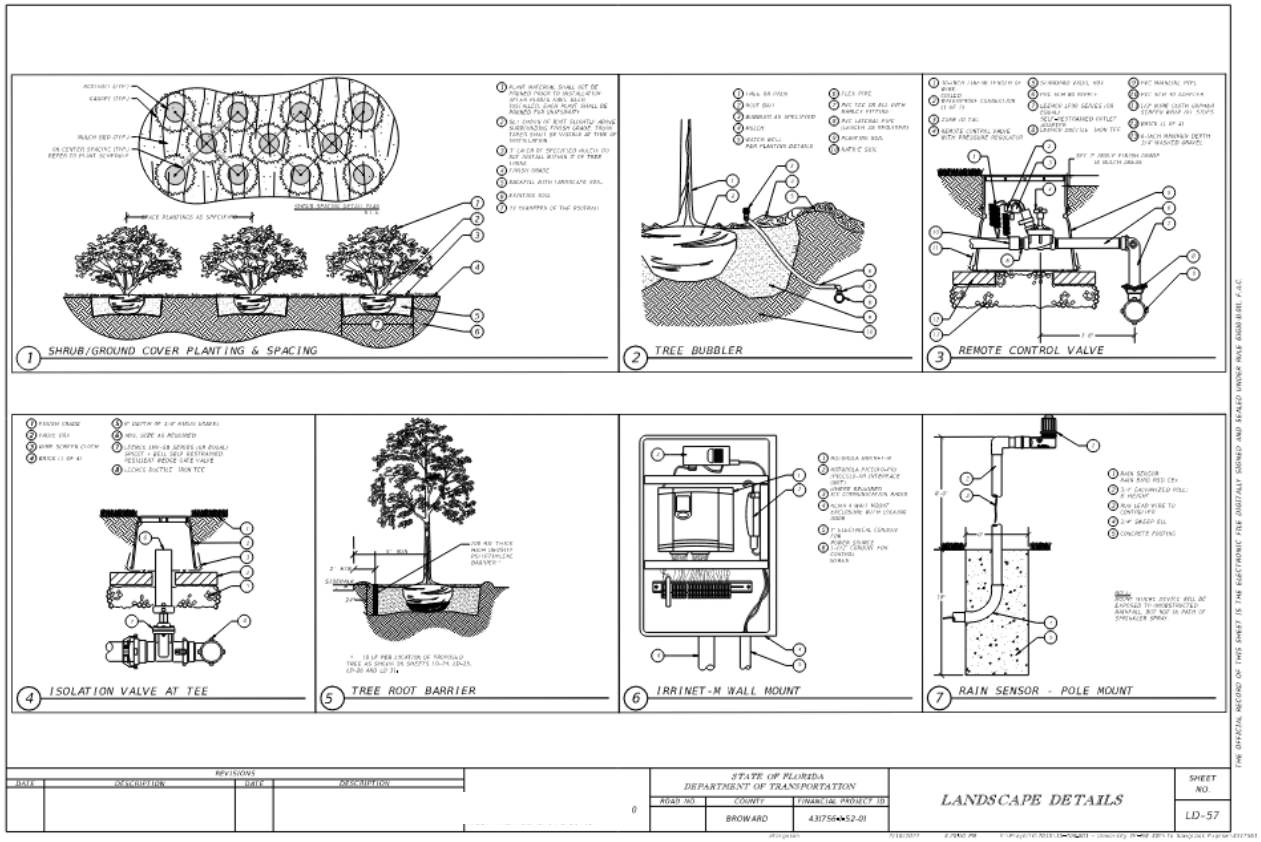
- **Landscaping Plan requirements (FDM 329)**
  - Stand alone set of plans
  - Landscaping Plan Sheets
    - Key Sheet
    - Signature Sheet
    - General Notes
    - Plant Schedule
    - Project Layout
    - Selective Clearing and Grubbing Plan (if applicable)
    - Tree Disposition Plan (if applicable)
    - Tree Disposition Charts (if applicable)
    - Landscape Plan
    - Irrigation Plan
    - Irrigation Details
    - Temporary Traffic Control Plan (if applicable)
    - Stormwater Pollution Prevention Plan (if applicable)

Landscaping Component

- **Common Coordination Items:**
  - Maintaining Agency Preferences
  - FDOT Landscape Architect
  - FDOTree
  - Landscaping Concept Report
    - Existing Inventory
    - Concept Design
      - Clear sight distance
      - Lateral Offset
      - Conservation Considerations
      - Proposed Landscape Improvements
      - Concept Plant Schedule
  - Coordination with roadway and drainage designers
    - Renderings
    - Selective clearing and grubbing locations
    - Ability to landscape near swales and ponds
    - Probable Cost Estimates
  - Outdoor Advertising
  - Power Service Coordination
  - Permitting

Landscaping Component

- Special Details



Toll Facilities Component

Toll Facilities Component

301 Toll Facility Plans Component Sheets

301.1 Master Key Sheet

The Toll Facility Plans Master Key Sheet must be prepared in accordance with ***FDM 302*** and include following:

(1) ***GTR*** criteria version used for design.

(2) Additional drawing number block. See ***Exhibit 301.1-1***.

(3) Index of Toll Facilities Master Plans

- (a) Toll Facility Plans Master Key Sheet, numbered TF-001.
- (b) Signature Sheets must begin numbering at TF-002 and be numbered sequentially.
- (c) Toll Site Location Map(s) must be numbered sequentially TF-00#, beginning with the next number following the signature sheets.

(4) Toll Facility Plans sub-component plans must be listed above the Index of Toll Facilities Master Plans. The sub-component plans must be included in the following order:

- (a) Toll Facilities Demolition / Renovation Plans
- (b) Toll Facilities Site Plans
- (c) Toll Facilities Building Plans
- (d) Toll Facilities Gantry Plans

GENERAL TOLLING REQUIREMENTS

PART 3 – PLANS PRODUCTION
MAY 2021

These can have further subcomponents including:

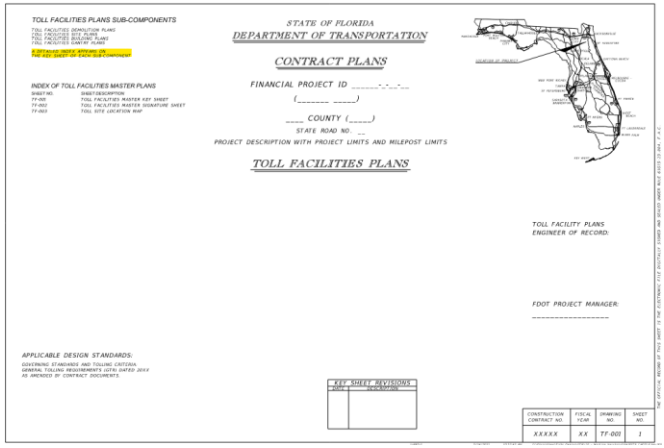
- *Civil*
- *Structural*
- *Architectural*
- *Mechanical*
- *Electrical*
- *Geotechnical*

Toll Facilities Component

- **Submit Site/Civil, Architectural, Structural sub-component plans during Phase I**
  - (GTR Section 302)
- **Each sub-component plan includes its own Key Sheet with a detailed index**
- **Signature sheet includes signatures for all disciplines in all sub-component plans.**

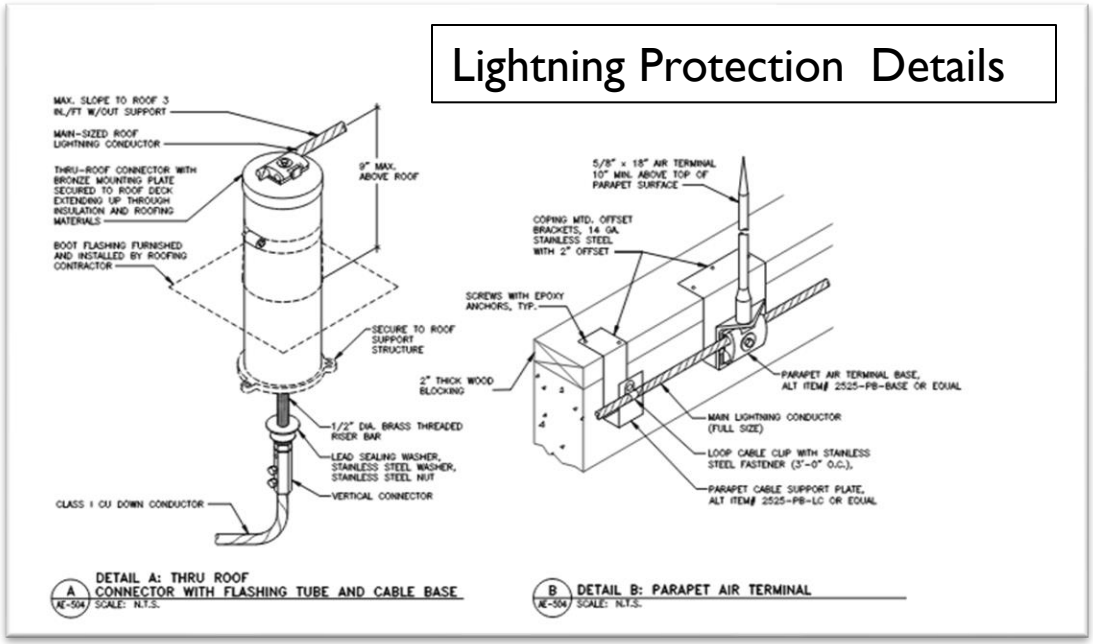
ITEM	PHASE I	PHASE II	PHASE III	PHASE IV
Toll Siting Technical Memorandum	See *GTR 300.1*			
Master key sheet, sub-component key sheets, and Toll Site Location Map	P	P	C	F
Signature sheets		P	C	F
Demolition / Renovation		P	C	F
Site civil	P	P	C	F
Site electrical	P	P	C	F
Architectural (building)	P	P	C	F
Structural (building)		P	C	F
Mechanical / plumbing (building)		P	C	F
Electrical (building)		P	C	F
Structural (non-accessible / accessible gantry)	P	P	C	F
Electrical (non-accessible / accessible gantry)		P	C	F
Engineer's Estimate		P	C	F
Design analysis reports (mechanical and electrical)		P	C	F
KMZ/KML files- civil, electrical, utility / communications. (site plans)		P	C	F
Technical Special Provision sections		P	C	F
Modified Special Provision(s)		P	C	F

Status Key:
P – Preliminary
C – Complete but subject to change
F – Final



Toll Facilities Component

- **Coordination Items**
  - Maintaining Agencies
  - Coordination with Design Disciplines
  - Utility Coordination



Utility Work by Highway Contractor Agreement (UWHC) Plan Component

UWHC Component

- **UWHC Agreement Plan requirements (FDM 330)**

For UWHC Agreements, prepare the utility plans in the same basic format as Department plans and as a separate plan set. Assemble the plans as follows:

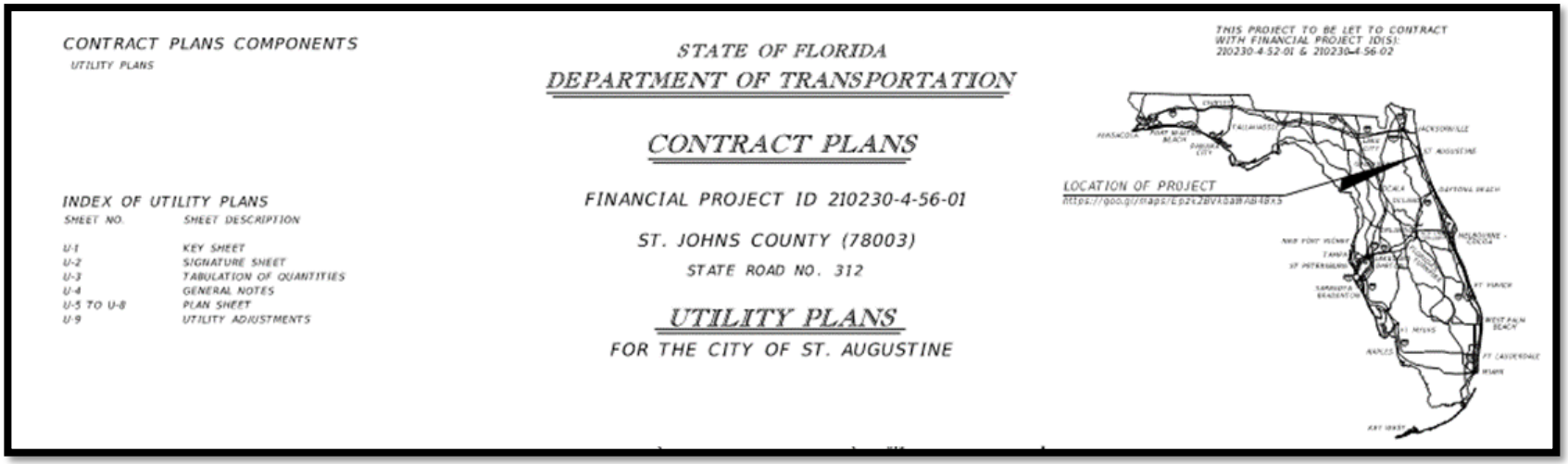
(1) Key Sheet

(2) Signature Sheet (if required)

(3) Plan-Profile Sheets

(4) Cross Sections (as required)

(5) Detail Sheets (as required)



CONTRACT PLANS COMPONENTS

UTILITY PLANS

INDEX OF UTILITY PLANS

SHEET NO.	SHEET DESCRIPTION
U-1	KEY SHEET
U-2	SIGNATURE SHEET
U-3	TABULATION OF QUANTITIES
U-4	GENERAL NOTES
U-5 TO U-8	PLAN SHEET
U-9	UTILITY ADJUSTMENTS

STATE OF FLORIDA

DEPARTMENT OF TRANSPORTATION

CONTRACT PLANS

FINANCIAL PROJECT ID 210230-4-56-01

ST. JOHNS COUNTY (78003)

STATE ROAD NO. 312

UTILITY PLANS

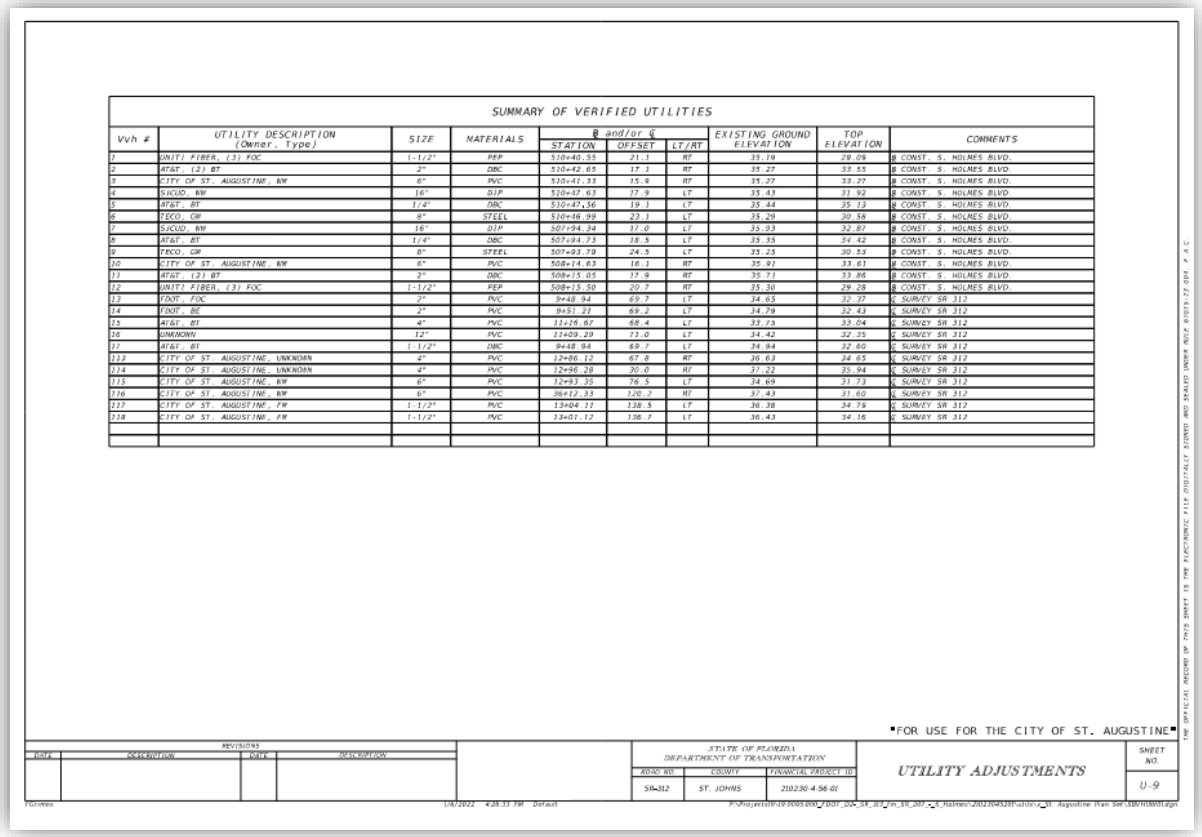
FOR THE CITY OF ST. AUGUSTINE

THIS PROJECT TO BE LET TO CONTRACT WITH FINANCIAL PROJECT ID(S): 210230-4-52-01 & 210230-4-56-02

LOCATION OF PROJECT

UWHC Agreement Plan Component

- **Special Details**
  - Sample: Utility Adjustments



SUMMARY OF VERIFIED UTILITIES

Vvh #	UTILITY DESCRIPTION (Owner, Type)	SIZE	MATERIALS	℄ and/or ℄ STATION	OFFSET	LT/RT	EXISTING GROUND ELEVATION	TOP ELEVATION	COMMENTS
1	UNITI FIBER, (3) FOC	1-1/2"	PEP	510+40.55	21.1	RT	35.19	29.09	@ CONST. S. HOLMES BLVD.
2	AT&T (2) BT	2"	DBC	510+42.65	17.1	RT	35.27	33.55	@ CONST. S. HOLMES BLVD.
3	CITY OF ST. AUGUSTINE, WW	6"	PVC	510+41.33	15.8	RT	35.27	33.27	@ CONST. S. HOLMES BLVD.
4	SJCUD, WW	16"	DIP	510+07.63	17.9	LT	35.43	31.92	@ CONST. S. HOLMES BLVD.
5	AT&T, BT	1/4"	DBC	510+47.56	19.1	LT	35.44	35.13	@ CONST. S. HOLMES BLVD.
6	TECO, GM	8"	STEEL	510+46.99	23.1	LT	35.29	30.58	@ CONST. S. HOLMES BLVD.
7	SJCUD, WW	16"	DIP	507+94.34	17.0	LT	35.93	32.87	@ CONST. S. HOLMES BLVD.
8	AT&T, BT	1/4"	DBC	507+94.73	18.5	LT	35.35	34.42	@ CONST. S. HOLMES BLVD.
9	TECO, GM	8"	STEEL	507+93.79	24.5	LT	35.23	30.53	@ CONST. S. HOLMES BLVD.
10	CITY OF ST. AUGUSTINE, WW	6"	PVC	508+14.63	16.1	RT	35.91	33.61	@ CONST. S. HOLMES BLVD.
11	AT&T (2) BT	2"	DBC	508+15.05	17.9	RT	35.71	33.86	@ CONST. S. HOLMES BLVD.
12	UNITI FIBER, (3) FOC	1-1/2"	PEP	508+15.50	20.7	RT	35.30	29.28	@ CONST. S. HOLMES BLVD.
13	FDOT, FOC	2"	PVC	9+48.94	69.7	LT	34.65	32.37	℄ SURVEY SR 312
14	FDOT, BE	2"	PVC	9+51.21	69.2	LT	34.79	32.43	℄ SURVEY SR 312
15	AT&T, BT	4"	PVC	11+16.67	68.4	LT	33.73	33.04	℄ SURVEY SR 312
16	UNKNOWN	12"	PVC	12+09.29	71.0	LT	34.42	32.35	℄ SURVEY SR 312
17	AT&T, BT	1-1/2"	DBC	9+48.94	69.7	LT	34.94	32.60	℄ SURVEY SR 312
113	CITY OF ST. AUGUSTINE, UNKNOWN	4"	PVC	12+86.12	67.8	RT	36.63	34.65	℄ SURVEY SR 312
114	CITY OF ST. AUGUSTINE, UNKNOWN	4"	PVC	12+96.28	30.0	RT	37.22	35.94	℄ SURVEY SR 312
115	CITY OF ST. AUGUSTINE, WW	6"	PVC	12+93.35	76.5	LT	34.69	31.73	℄ SURVEY SR 312
116	CITY OF ST. AUGUSTINE, WW	6"	PVC	36+12.33	120.2	RT	37.43	31.60	℄ SURVEY SR 312
117	CITY OF ST. AUGUSTINE, FM	1-1/2"	PVC	13+04.11	138.5	LT	36.38	34.79	℄ SURVEY SR 312
118	CITY OF ST. AUGUSTINE, FM	1-1/2"	PVC	13+01.12	136.7	LT	36.43	34.16	℄ SURVEY SR 312

"FOR USE FOR THE CITY OF ST. AUGUSTINE"

REVISIONS — DATE | DESCRIPTION | DATE | DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-312	ST. JOHNS	210230 4 56 01

UTILITY ADJUSTMENTS

SHEET NO. U-9

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

Structures Component

Joe Losaria, P.E.
Patel, Greene & Associates (PGA)
VP/Principal, Structures Group Manager

Structures Component

- **Key items to review prior to developing final bridge plans:**
  - Typical Section Package
  - Bridge Development Report (BDR) recommendation
    - *Typical Section Package is a prerequisite to BDR*

  - Existing Bridge/Wall Survey
  - Geotechnical Information
  - Hydraulics Requirements
  - Pedestrian Requirements
  - Drainage Requirements
  - Aesthetic Requirements
  - Existing Utilities / Site Constraints
  - Railroad Requirements
  - Wildlife Crossing Requirements

These elements are typically addressed in BDR

Structures Component

- **Structures Submittals**
  - BDR
  - 30%
  - 60%
  - 90%
  - 100%

BDR and 30% submittals may coincide

60% submittal required for Category 2 Structures

Category 2 Structures include:

- *Substructures containing: post-tensioned components, straddle piers, integral caps*
- *Vessel collision or wave loads*
- *Non-redundant foundations, micropiles, auger cast piles*
- *Fiber Reinforced Polymer materials*
- *Braided underpass structures*
- *Non-standard design elements or construction techniques*

Structures Component

- General Plan Sheets
- Bridge Plan Sheets
- Wall Plan Sheets
- Standard Plans for Bridge Construction
- Existing Plans

STANDARD PLANS FOR BRIDGE CONSTRUCTION

400-090	APPROACH SLABS (30 FT.) (FLEXIBLE PAVEMENT APPROACHES)
400-510	COMPOSITE ELASTOMERIC BEARING PADS - PRESTRESSED FLORIDA-I AND AASHTO TYPE II BEAMS
415-001	BAR BENDING DETAILS (STEEL)
450-010	FLORIDA-I BEAM TYPICAL DETAILS AND NOTES
450-054	FLORIDA-I 54 BEAM - STANDARD DETAILS
450-199	PRESTRESSED I-BEAMS BUILD-UP AND DEFLECTION DATA
450-512	BEARING PLATES (TYPE 2) - PRESTRESSED FLORIDA-I AND AASHTO TYPE II BEAMS
458-110	EXPANSION JOINT SYSTEM - POURED JOINT WITH BACKER ROD
521-427	TRAFFIC RAILING - (36" SINGLE-SLOPE)
521-428	TRAFFIC RAILING - (42" SINGLE-SLOPE)
521-660	LIGHT POLE PEDESTAL - BRIDGE
630-010	CONDUIT DETAILS - EMBEDDED

SDM Section 3.7

". Include a list of relevant ***Standard Plans for Bridge Construction*** on the "Index of Structure Plans" behind the bridge and/or culvert sheets (B#-##), but before the existing bridge sheets (BX#-##). Attach the associated PDF files in the Structure Component Plans for each bridge number or culvert following the sequence of the "Index of Structure Plans".

Structures Component

- **General Plan Sheets**
  - Key Sheet
  - Signature Sheet
  - Index of Sheets
  - General Notes
  - Common Details

GENERAL SHEETS

B-01	KEY SHEET
B-02	SIGNATURE SHEET (1 OF 2)
B-03	SIGNATURE SHEET (2 OF 2)
B-04	INDEX OF SHEETS (1 OF 2)
B-05	INDEX OF SHEETS (2 OF 2)
B-06	GENERAL NOTES (1 OF 3)
B-07	GENERAL NOTES (2 OF 3)
B-08	GENERAL NOTES (3 OF 3)
B-09	UNDERDECK LUMINAIRE DETAILS
B-10	SLOPE PAVEMENT DETAILS
B-11	STAY-IN-PLACE METAL FORM DETAILS

Other common details:

- *Surface Finish Details*
- *Steel Pile Splice Details*
- *Utility Hanger Details*

Structures Component

- **Bridge Plan Sheets**
  - Plan and Elevation *
  - Typical Section *
  - Construction Sequence *
  - Soil Borings *
  - Foundation Details *
  - Substructure Details *
  - Table of Beam Variables
  - Superstructure Details
  - Finish Grade Elevations
  - Miscellaneous Details
  - Reinforcing Bar List
  - Bridge Load Rating Summary

Sequence of plans corresponds to general sequence of bridge construction

FDM Tables 121.14.1 and 121.14.2 provide a detailed list of required structures plan sheets and level of completion at each submittal

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
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		P	S	S	C	F
End Bent		P	S	S	C	F
End Bent Details			S	S	C	F

** 30% structures plan set requirement*

Structures Component

FLORIDA DEPARTMENT OF TRANSPORTATION

STRUCTURES DETAILING MANUAL

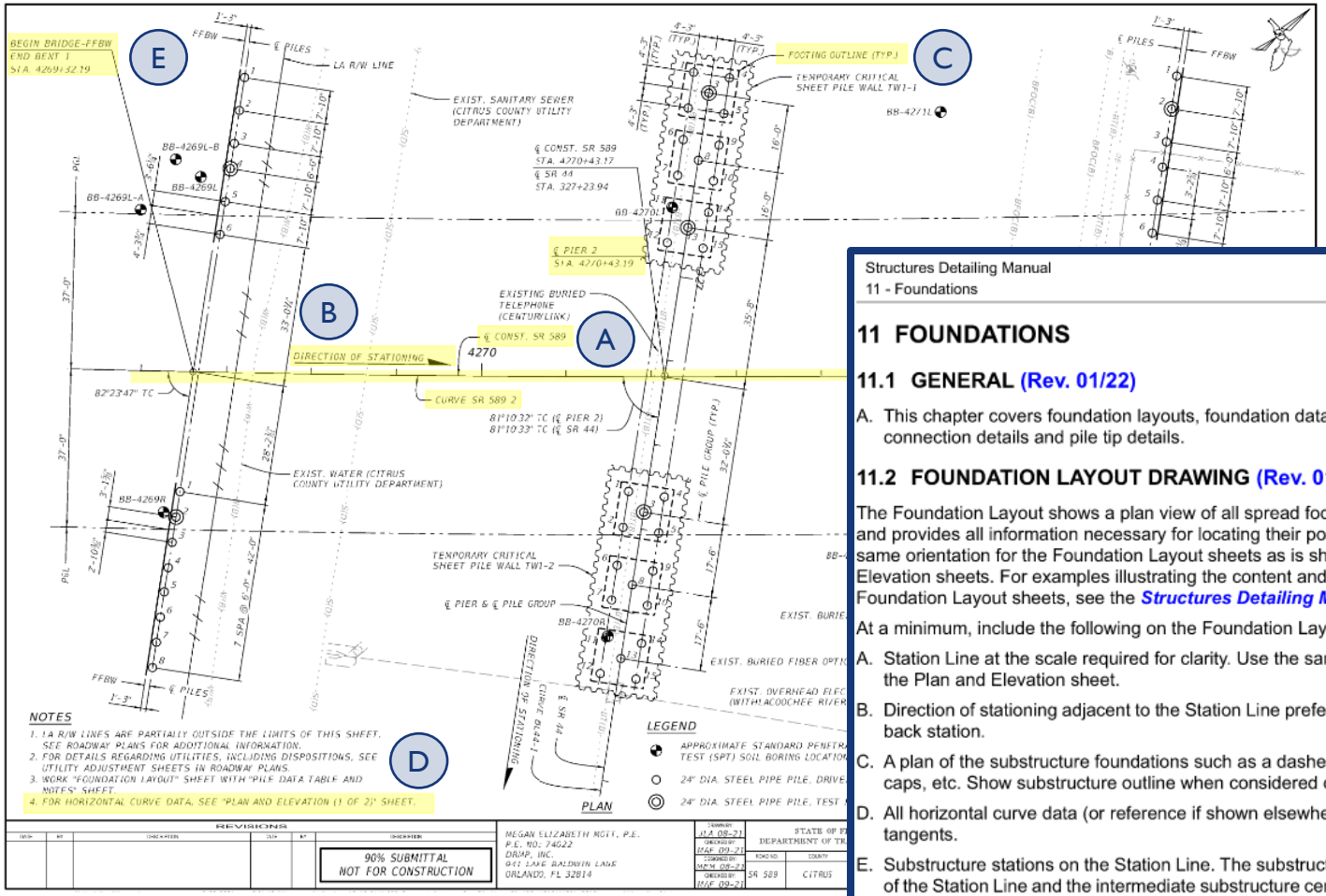
STRUCTURES MANUAL
VOLUME 2
JANUARY 2022

FDOT

FDOT Structures Detailing Manual (SDM) provides plans detailing requirements for Structures Component

FDOT

Structures Component



Structures Detailing Manual
11 - Foundations

Topic No. 625-020-018
January 2022

11 FOUNDATIONS

11.1 GENERAL (Rev. 01/22)

A. This chapter covers foundation layouts, foundation data tables, foundation-to-footing connection details and pile tip details.

11.2 FOUNDATION LAYOUT DRAWING (Rev. 01/22)

The Foundation Layout shows a plan view of all spread footings, piling or drilled shafts and provides all information necessary for locating their positions in the field. Use the same orientation for the Foundation Layout sheets as is shown on the Plan and Elevation sheets. For examples illustrating the content and format of completed Foundation Layout sheets, see the ***Structures Detailing Manual Examples***.

At a minimum, include the following on the Foundation Layout sheets:

A. Station Line at the scale required for clarity. Use the same Station Line referenced in the Plan and Elevation sheet.

B. Direction of stationing adjacent to the Station Line preferably at the extreme ahead or back station.

C. A plan of the substructure foundations such as a dashed outline of footings, bent caps, etc. Show substructure outline when considered critical for construction.

D. All horizontal curve data (or reference if shown elsewhere) including bearings of tangents.

E. Substructure stations on the Station Line. The substructure station is the intersection of the Station Line and the intermediate substructure centerline or begin/end of bridge at the front face of backwall (FFBW). For end bents, dimension the distance between FFBW and the centerline of piles.

Lessons Learned – Structures Component Sets

- **Lessons Learned (Bridge Component Set):**
  - **BHR:**
    - Need for coastal engineer (wave loading), can drive schedule
  - **Category 2 Structures**
    - Need for Central Office Review
    - Special structure types (movable bridges, segmental bridges)
  - **Pedestrian Bridges**
    - FDM 266
    - Knowledge of Prefabricated Steel Truss Bridge Process
  - **Bridge Development Report (BDR) versus BDM**
  - **Awareness of structures submittal schedule compared to roadway submittal schedule**
    - Phase II Roadway = Phase I Structures
    - Phase II Structures (standalone submittal)
    - Phase III Roadway = Phase III Structures
  - **Need for 3D Modelling (OBM)**

Lessons Learned – Structures Component Sets

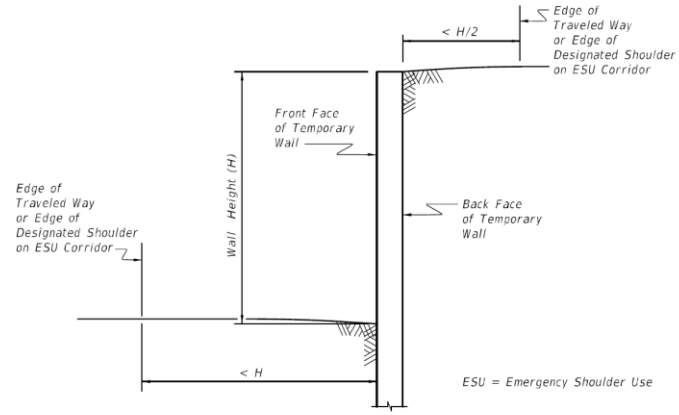
- **Lessons Learned (Miscellaneous Structures):**
  - **Culverts**
    - Requires separate structures component set (FDM 324 / 925)

324.4 Concrete Box Culverts

Place these sheets in a Structures Component, even when there are no bridge plans. Some of these sheets were previously shown in the Roadway Component Plan, but all of them are now to be shown in the Structures Component Plan regardless if the box culvert is categorized as a bridge or not.

  - **Walls**
    - Need for temporary critical walls
    - FDM 262.2 – Retaining Wall Submittal Procedures
  - **Ancillary Structures Reports (FDM 261)**
  - **Submittal schedule for signal/sign structures (FDM 301 / 901)**
  - **Strain Poles**
    - Steel strain poles
    - Concrete strain poles
  - **Multi-Post Sign Structures**
    - Requires Mathcad Program

Figure 19.7-1 Location of Critical Temporary Walls



FDOT ACEC

PM ACADEMY

Specifications

Andy Cummings, P.E.
Connelly & Wicker
Vice President

Specifications

- **Similar process between Minor and Major projects**
- **Must be Specification Training certified to prepare AND check project specifications**
  - 5 year re-certification required
- **Key is EARLY identification**
  - Technical Special Provision (TSP) – new specification
  - Modified Special Provision (MSP) – modification of existing FDOT specification
  - TSP & MSP require DISTRICT and CENTRAL OFFICE review and approval
- **Proprietary Product Certification (PPC)**
  - For single source items
  - Requires DDE signature

Specifications

- **Examples of TSP's**
  - Bridge joint requirements
  - UWHC – adding the utility companies standards & specification to the FDOT contract
  - Decorative light fixtures
- **Examples of MSP's**
  - Vehicle Detection for Wrong Way signs
  - Lighting color requirements
- **Examples of PPC's**
  - Decorative light fixtures
  - Signalization products
- **Submittals**
  - PS&E No. 1 – unsigned
  - PS&E No. 2 – S+S
- **New (2022) interim D2 Specifications coordinator - Tracy Witt**
  - Pre-submittal meetings are encouraged in D2

Quality Management

Quality Management Plan (QMP)

- **Purpose**
  - Ensures the project's deliverables are complete, orderly, correct and appropriate for the intended purposes.

- **Defines**
  - the Quality Control (QC) processes that will be implemented on all reports, project documents, calculations, and plans.

- **QMP**
  - 2022 FDM - Section 124
  - Defines the projects deliverables & submittals
  - Typically submitted 20 days after NTP
  - Approval required prior to payment of 1st invoice

Quality Management Plan (QMP)

- **Defines the Team's Staffing**
  - EOR
  - Lead Technical Professional
  - QC Reviewer
  - Quality Assurance (QA) Manager
  - BIM Manager
  - Staffing for **EACH** design discipline/submittal (structures, geotechnical, lighting, signals, variation & exception, typical sections package, pavement design, BIM files, EQ Report, Specification package)

- **Defines the Checking process (5-steps)**
  - Origination
  - Checking
  - Concurrence
  - Changes made
  - Changes verified

- **Certificate of Compliance**

Quality Management Plan (QMP)

- **Schedule development**
  - Once project submittal requirements and dates are defined, then the QC schedule should be established and added/confirmed with the project schedule
- Includes and defines **Design Criteria** for the project
  - Criteria may be updated or change during the project duration
- **Checklists and Procedural requirements**
  - Both internal company and Client checklists
  - Includes Certificate of Compliance
- **Audits**
  - Defines Audit procedures, Assurance procedures, Independent Peer reviews

Quality Management Plan (QMP)

- Should now include **Electronic Review Procedures**

- **Developmental Reviews – (3 C's)**
  - Conformance: Adhering to Standards in the FDOT CADD Manual
  - Completeness: BIM meets minimum Level of Development (LOD)
  - Consistency: BIM files are accurate

- **Design Analysis Reviews**
  - QC Reviewers identify unsuitable conditions such as;
    - Drainage issues, vertical or horizontal clearance problems, intersections with undesirable geometrics, constructability issues

- **Interdisciplinary Reviews**
  - Identify conflicts or inconsistencies between various disciplines

FDOT ACEC

PM ACADEMY

Pass The Torch

Mike Molkenbur, P.E.
Florida Department of Transportation
District 2 Consultant Project Management Engineer

Pass The Torch (Design to Construction)

- **Meeting is held at the request of the FDOT Construction PM**
- **Meeting is held at PS&E 1 Development Stage**
- **Intent of meeting – familiarize construction personnel with the project information and discuss specific items that may not be evident from a review of the final plans and specifications**
- **NOT a review meeting for receiving comments on the design and specifications**
- **FDOT Project Manager's role**
  - Discuss need for meeting with Construction
  - Schedule the meeting
  - Ensure right people/affected disciplines are invited
  - Prepare and send out the agenda
  - Provide exhibits with assistance from Consultant
- **Consultant's Role**
  - Assist in the preparation of the agenda
  - Assist in the preparation of issue specific exhibits
  - Run the meeting (if desired by FDOT PM) and take notes. Later, prepare minutes.
  - Be prepared to answer questions posed by Construction personnel

Pass The Torch (Design to Construction)

- Sample Meeting Agenda

SR 312 from SR 207 to S. Holmes Blvd.

Pass the Torch Meeting – Meeting Minutes

Meeting Date: 4/14/2022 10:00 am
Project ID: 210230-4-52-01, 210230-4-56-02 & 210230-4-56-01
Let Date: 5/25/2022

Project Description/ Items of Work:
The primary scope of this project is to construct a 2-lane new alignment from SR 207 to S. Holmes Blvd. in St. Johns County. Other design activities include utility relocation (performed by the highway contractor), temporary traffic control plans, signing and pavement markings, signalization, and lighting services.

Project team:

- Will Lyons – FDOT Design PM
- Don Devenny – FDOT Construction PM
- Colette Moss – Consultant PM (DRMP INC.)
- Kimberly Sadowski – Roadway Plans EOR (DRMP INC.)
- Juan Gonzalez – UWHC Plans EOR (DRMP INC.)
- Roland Davis – Utility Coordination (Atkins)
- Andre Sutherland SPE – CEI (GAI)
- DeWayne Osteen PA – CEI (GAI)

Meeting Attendance:

Will Lyons, FDOT	Justin Garland, FDOT	Daniel Penniman, FDOT	DeWayne Osteen, GAI
Star Ayers, FDOT	Todd Hunt, FDOT	Aja Stoppe, FDOT	Andre Sutherland, GAI
Donald Devenny, FDOT	Terri Newman, FDOT	Greg Dever, APTIM	Kimberly Sadowski, DRMP
			Colette Moss, DRMP

Project improvements of note:

Environmental:

- Forested wetland impacts have been mitigated.
- 90 days before construction, the project corridor will be resurveyed for gopher tortoises. There were none found in prior surveys.
- Clearing and Grubbing pay items may encompass unnatural debris due to illegal dumping at ± Sta. 17+00.00 to ± Sta. 323+00.00 and Sta. 359+00 to Sta. 365+00.00. All work will be covered under the clearing and grubbing pay item.
  - There is not a special call-out for solid waste or a TSP item in the construction plans. Debris that has been picked is above ground, not buried.
- There are 2 Environmental Commitments. One protection of the gopher tortoise and two eastern indigo snake
- Currently, the groundwater at circle K is being treated and showing positive results. The area will be reassessed and may be cleared by the time we get to construction.
- 2 permits SJRWMD ERP and State 404 – The content in each permit mirror the other.
  - Erosion Control Devices are required to be in place before construction.
  - Not adhering to the state commitments is a violation of the Clean Water Act.
  - Required Forms per the State 404 permit must be submitted 48 hours before construction.
  - As-Builts are required for both permits.
  - Permit duration is 5 years – These dates vary slightly due to acceptance of the permit.

Roadway:

- Hybrid Access Management Public Meeting was held on November 9, 2021.
- SR 207 will be milled and resurfaced under FPID: 445546-1; Letting Date: 12/7/2022; FDOT PM Carlee Beauchamp.
  - West leg of SR 207 pedestrian crosswalk will be removed in the SR 312 project.
- Coordinate the construction of the bus pad with the construction of the right turn lane for the proposed car wash next to the Circle K. Coordinate a temporary bus stop in the interim. The current bus stop location is located along Whispering Woods.
  - The future bus pad will be located next to the proposed right turn lane to access the car wash. The right of way for the turn lane was a donation from FDOT.
- Fence FDOT Property. The fence runs along the FDOT property that extends south of the alignment and west of Circle K.
  - This project will only be cleared with the fence construction area.
- Black Base areas are located at the beginning of the project and at S. Holmes Blvd.
- The berm ± Sta. 19+00.00 to ± Sta. 364+24.00 is intended to be a future shared-use path. The project is not funded at this time.
- Do not over excavate Pond C. This Pond will be filled in when the SR 312 corridor is extended in the future. Use caution when construction due to the location of the borrow pits nearby.
- The driveway litigation was reopened concerning the access to the Circle K. The negations are nearing completion. The property owner has mentioned they are not pleased with the proposed height of the fence along the LA ROW. The fence might be reduced to 4 feet.

Pass The Torch (Design to Construction)

- Sample Meeting Agenda

Temporary Traffic Control:

- Contract time is 450 contract days.
- No Lane Closures 6:30 am to 10:00 pm (Existing SR 312, SR 207, and S. Holmes Blvd.)
- Maintain Access to Whispering Pines, Circle K, and Simms Pitt.

Right of way:

- All R/W for this project was acquired under FPID 210230-2 SR 312 Ultimate Project.
- R/W is tight on S. Holmes Blvd.
- License Agreements were executed for the construction of driveways on S. Holmes Blvd.
- Transfer & Maintenance Agreement was executed with SJC.

Utilities:

- Utility Schedules and planned construction activities by the utility company.
  - The city of St. Augustine and St. Johns County have Utility Agreements on file.
    - UWHC FPID: 210230-4-56-02 - St. Johns County
      - Relocate 16" DIP WM along S. Holmes Blvd.
      - Work completed during the months October to February
        - The county current active mainline WM improvements shall be completed prior to the Holmes WM relocation. This is a precautionary measure to provide, protect and supply the WM utility
      - Applied for their Permit. Permit in the "Completeness Check" Stage. Permit # is 2022-H-297-00072
      - Under a separate contract, SJC is working on obtaining rights to place a 20" reclaimed water line along the southern right of way limits from SR 207 to S. Holmes Blvd.
      - SJC is awaiting the state engineer's office approval. Could be the middle of June. Bidding next month regardless.
      - Work is Compensable
    - UWHC FPID: 210230-4-56-01 - City of St. Augustine
      - Relocate 6" WM along S. Holmes Blvd.
      - UWHC includes other minor adjustments along the SR 312 corridor.
      - Only requires a Permit. The permit has been approved as of 4/13/22.
      - Work is non- compensable.
  - FP&L Distribution - UWS
    - Poles will be removed along S. Holmes Blvd.
    - Relocate from Aerial to Buried.
    - Only requires a Permit. The permit has not been approved as of 4/13/22.
  - FP&L Transmission
    - No Facilities within project limits
  - Comcast - UWS
    - Relocate from Aerial (FP&L) to Buried along S. Holmes Blvd.
    - Only requires a Permit. The permit has not been received as of 4/13/22.
  - AT&T - UWS
    - Relocate from Aerial (FP&L) to Buried along S. Holmes Blvd.
    - Only requires a Permit. The permit has not been received as of 4/13/22.
  - Teco Peoples Gas - UWS
    - Coordination and minor adjustments as needed.
    - Contractor for TECO is scheduled to begin work later this month.
  - Uniti Fiber - UWS
    - Existing Buried lines, the UWS is for Locate, Protect, and Designate. This will be completed during Construction.

Pass The Torch (Design to Construction)

- **Issues not evident in the final plans and specifications**

  - Clearing and Grubbing pay items may encompass unnatural debris due to illegal dumping at ± Sta. 17+00.00 to ± Sta. 323+00.00 and Sta. 359+00 to Sta. 365+00.00. All work will be covered under the clearing and grubbing pay item.
    - There is not a special call-out for solid waste or a TSP item in the construction plans. Debris that has been picked is above ground, not buried.

  - Do not over excavate Pond C. This Pond will be filled in when the SR 312 corridor is extended in the future. Use caution when construction due to the location of the borrow pits nearby.

  - The driveway litigation was reopened concerning the access to the Circle K. The negations are nearing completion. The property owner has mentioned they are not pleased with the proposed height of the fence along the LA ROW. The fence might be reduced to 4 feet.

Pass The Torch (Design to Construction)

- **Issues not evident in the final plans and specifications**
  - **Property owner issues** such as access issues, work on property frontage, etc. Especially important with businesses in urban areas.
  - **Utility issues** – issues to be aware of that may not be apparent from a review of the plans and/or utility work schedules. Where the pre-work stands. Do we have as-builts from the pre-work. Utility contract information. Schedule updates from the utility project manager.
  - **Commitments –** have they been made to anyone along the project?
  - **Maintenance Entity –** who will maintain the project once it's completed?
  - **Permits –** anything out of the ordinary?
  - **TCE's or License Agreements**
  - **Future tie-ins –** explain the intent so that construction can be sure to deliver a product consistent with the intent
  - "**Tricky" design elements –** items that required an atypical approach during design, why was this required? Other considerations?
  - **TTCP Phasing –** Discuss why construction phasing was set up the way it is. This is especially helpful when the contractor proposes a change to the phasing.
  - **Surrounding developments** – local neighborhood associations or environmental associations
  - **Adjacent project coordination/future considerations**

Activities Prior to Project Letting

- **Reminder - Submit Post Design Staff hours and Scope of Services with your PS&E 1 submittal**
- **Project has been accepted by Plans, Specs and Estimates (PS&E)**
- **Project sent to Tallahassee for Advertisement for Central Office Lettings**
  - NOTE: Project sent to District Contracts for advertisement for District Office Lettings.
- **What does the Consultant EOR do during advertisement and bid submittal by Contractors?**
  - Respond to Bid Questions submitted in accordance with dates and times shown in Special Provision Section 2-4

Activities Prior to Project Letting

- Once bids are received, Pay Items and Quantities Verification Report completion
  - "…to determine if the bid quantities and pay items are correct. The Consultant's Project Manager must ensure that the quantities are re-calculated to verify bid quantities and the pay items are evaluated for proper usage."

June 15, 2022

Pay Items and Quantities Verification Report for T2844

Project ID: 439356-1-52-01 **Federal Aid #:** D221033B

The purpose of this review is to determine if the bid quantities and pay items are correct. The Project Manager must ensure that the quantities are re-calculated to verify bid quantities and that the pay items are evaluated for proper usage.

Contract: T2844
Project Description: SR5(US1/PHILIPS HWY) FROM: SR152(BAYMEADOWS RD) TO: SR109(UNIV BLVD) - RESURFACING

Lowest Bid: WATSON CIVIL CONSTRUCTION, INC. **Low Bid Amount:** $19,892,956.00
Letting Date: 2022/06/15 **District/County:** TWO/DUVAL **2ND Low Bid Difference:** $2,169,930.53

Category	Pay Item	Description	Present Quantity	Units	Is the quantity correct?	Is the item number correct?
0200	0102107 1	TEMPORARY TRAFFIC DETECTION AND MAINTENANCE, INTERSECTION	1,920.000	ED	(Yes) No	(Yes) No
COMMENTS						
	0327 70 8	MILLING EXISTING ASPHALT PAVEMENT, 2 1/2" AVG DEPTH	113,826.000	SY	(Yes) No	(Yes) No
COMMENTS						
	0327 70 15	MILLING EXISTING ASPHALT PAVEMENT, 2 3/4" AVG DEPTH	8,397.000	SY	(Yes) No	(Yes) No
COMMENTS						
0300	0700 1 60	SINGLE POST SIGN, REMOVE	48.000	AS	(Yes) No	(Yes) No
COMMENTS						

Activities Prior to Project Letting

- **Rare Case** - No bids are received. Consultant's Project Manager should be available to quickly respond to questions that may be raised by our Estimates Department or other Departments
- **Sample Questions when No Bids Received**
  - What transportation and/or critical safety deficiencies are being corrected by this contract, and if deferred, what are the negative impacts to the public transportation safety and/or needs? Provide supporting documentation to identify the seriousness and priority of safety issues. For instance, number of accidents and probable cause, or traffic congestion problems, etc.
  - Would completion of this contract result in completing a "gap" in a section of new highway, thus allowing this section to be opened to traffic? If yes, please explain.
  - Will delaying this contract have a substantial impact on the facility completion and/or traveling public needs? Also, will delaying require any emergency repairs to the facility? If yes, please explain.

Project Letting

- Project has been Let/Awarded/Executed/NTP Issued
- Construction Begins

Open Discussion

Presenters

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Additional Training - Project Management webinar series:

https://www.fdot.gov/designsupport/pm/webinarseries.shtm

Thank you for attending!