

300 Production of Plans

300.1 General

The requirements provided in the **Plans Production** section of the **FDM** (the **300 Series**) and the **FDOT CADD Manual** form the basis for contract plans format and assembly.

Many chapters contain “generic” exhibits that provide examples of the plan sheets covered by that chapter. These exhibits were developed using the Department’s criteria and standards in force at the time of their creation. These exhibits are not to be used as a source for criteria unless specified as such within the **FDM** chapter.

Abbreviations may be used to save space. A list of standard abbreviations is given in the **Standard Plans Cover**. Additional deviations from these standard abbreviations are allowed, provided that the abbreviation used is clear and easily understood.

Standard symbols for Roadway Design are shown in the Symbol Cell Library, and in other CADD sources.

Placing the Consultant’s business logo on any plan sheet contained in the Contract Plans is prohibited .

300.1.1 Converting from Metric to English

When converting metric values related to surveys, R/W, and other geometric alignment use the U.S. Survey Foot taken to a minimum of 8 decimal places:

$$1 \text{ foot} = 0.30480061 \text{ meters}$$

For other direct mathematical conversions use the SI definition to 4 decimal places:

$$1 \text{ foot} = 0.3048 \text{ meters}$$

Display direct mathematical (soft) converted values to 2 decimal places.

On resurfacing projects where the original construction was done in metric, hard convert typical section dimensions (e.g., lane widths, shoulder widths) where existing conditions permit.

Use direct mathematical (soft) conversion for existing pavement widths in curbed sections, existing R/W widths, and existing median widths.

300.2 Displaying Information and Data

Text and plan details should be readable from either the bottom or right edge of the sheet. Orientation of text is as follows:

- (1) Horizontal Line: Read left to right
- (2) Vertical Line: Read bottom to top
- (3) Diagonals: Read left to right

Apply the following rules for displaying information and data:

- (1) Dimensioning Requirements:
 - (a) Typical Section Elements, including lane widths and shoulder widths - in feet, typically as a whole number.
 - (b) Horizontal control points on plans, including survey centerline, baseline, intersections and alignment - in feet to 2 decimal places.
 - (c) Vertical alignment control points, (e.g., PVC, PVI, PVT) and profile grade elevations - in feet to 2 decimal places.
 - (d) Profile Grade - in percent to 3 decimal places.
 - (e) Proposed flow lines - in feet to 2 decimal places.
 - (f) Manhole tops and grate elevations - in feet to 2 decimal places.
 - (g) Ditch elevations - in feet to 1 decimal place (to nearest 0.05 when controlled by percent of grade).
 - (h) Box or Three-sided Culvert Spans and Heights - Show inside dimensions using "span by height" format (10 x 6 means the span is 10 feet and the height is 6 feet). In feet as a whole number for new construction; in feet to 2 decimal places for extensions of existing box culverts.
- (2) Display alignment bearings, degree of curve and delta angles for curve data in degrees, minutes and seconds, rounded to the nearest second.
- (3) Express slope ratios in vertical to horizontal (V:H) format; e.g., 1:6, 1:4.

300.3 Base Sheet Format

All plan sheet formats are contained in the FDOT CADD Software. Sheet borders include a project information block to place the Financial Project ID as shown [below in Figure 300.1](#):

Figure 300.1 Project Information Block

	<i>STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION</i>		
	<i>ROAD NO.</i>	<i>COUNTY</i>	<i>FINANCIAL PROJECT ID</i>

The road number box is intended for the state road number; i.e., same state road number that is shown on the Key Sheet. Place the prefix “SR” before the number for clarification. When a county road is shown in the box use the prefix “CR”. The box should remain blank when the facility is neither a state nor county road.

The title block immediately left of the project information block is to contain information for the Professional of Record that Signs and Seals the sheet, as discussed in **FDM 130**.

PDFs of contract plans must be to scale at size B (11" X 17"). These PDF files are to be generated from CADD design files in accordance with the [CADD Manual](#). Sheets that feature grids (e.g., cross sections, plan-profile) may be created with minor grid lines turned off or on. The minor grids are to be half-toned when shown. The FDOT CADD Software provides plot example configuration files for this task.

Plan sheets may use photography (aerial or other) when appropriate (e.g., for Drainage Maps, SWPPP supplemental site maps, bridge repair plans).

301 Sequence of Plans Preparation

301.1 General

The set of plans depicting in detail all the desired construction work is known as the "Contract Plans Set". This set is assembled as component plans that are associated with a primary work type. See **FDM 302.5** for information on contract plans components. The contract plans set should be prepared systematically, undergoing phases of review and updates to ensure technically correct and clear plans. Additional information can be found in **FDM 110, 111, 112, and 120**. These chapters contain a comprehensive discussion of design processes and activities from initial to final engineering.

Prepare Toll Facility Plans in accordance with the Florida's Turnpike Enterprise **General Tolling Requirements (GTR)**. Contact the Florida's Turnpike Enterprise Project Manager to request a copy of the GTR.

301.2 Phase Submittals

Modification for Non-Conventional Projects:
Delete FDM 301.2 and follow FDM 301.3 .

Coordinate Specifications and Estimates in accordance with the plans review phases in **Table 301.2.1**:

Table 301.2.1 Summary of Phase Submittals

	Phase				
	I	II	III	IV	PS&E "Final Submittal" Phase
Plans	FDM 301.2.1	FDM 301.2.2	FDM 301.2.3	FDM 301.2.4	FDM 301.2.5
Specifications per Specifications Handbook		Identify Specs; draft TSP, MSP, or DevSpec, as needed	Submit TSP or MSP for Technical and Legal review(s)	Prepare Specification package with latest e-book and workbook	Finalize Specifications package
		Complete Sole-Source Approvals, as needed.	Ensure specifications work with APL, IPL, or sole-source items		
Estimates, per Basis of Estimates		Load pay items per BOE Chapter 9 ; request pay items per BOE Chapter 6 , based on TSP or MSP's identified.	Load quantities for all pay items, per BOE Chapter 8	Update quantities based on final plans	Final
		Summary of Pay Items Report	Estimated Quantities Report	Estimated Quantities Report	Estimated Quantities Report
Cost Estimates by District Estimator	Completed prior to next phase submittal	Completed prior to next phase submittal	Completed prior to next phase submittal	Authorization Estimate: Completed prior to <u>XXX</u>	Authorization Estimate & Official Estimate

See **FDM 120** for design submittal requirements and guidance in preparing submittals for review by the Department. For bridge submittal requirements see **FDM 121**.

Standard submittal phases are: Phase I, Phase II, Phase III, Phase IV, and PS&E.

General descriptions of the required levels of completion that are noted in **Table 301.2.2** are as follows:

- (1) Preliminary (P): Basic shapes, geometry, and information are shown to adequately convey the concept.
- (2) Complete but Subject to Change (C): The design, drawings and details are complete. Only reviewer-initiated changes should be expected at this level.
- (3) Final (F): All drawings and designs are complete. No changes are expected at this level. Plans are ready to be signed and sealed by the EOR.

RRR, operational improvement, and safety projects typically have two phase reviews, which will be defined in the Scope of Services. **Table 301.2.2** summarizes the plans sheet status for each submittal. A phase is considered complete when all review comments have been resolved and documented.

A "Notes for Reviewers" sheet may be placed behind the Key Sheet to call attention to conditions, issues and features unique to the project design. Do not use this sheet beyond Phase III submittal.

Provide a PDF of the Summary of Pay Items Report generated from the Department's Webgate for each phase submittal, beginning with Phase II. Report is without quantities for Phase II submittal, and with quantities for all subsequent submittals.

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
Vegetation-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.

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)

DRAINAGE MAP - PROFILE VIEW

- Preliminary profile grade & existing ground line
- Horizontal & vertical scale
- Begin & end stations of project, bridges, bridge culverts & exceptions
- Equations

INTERCHANGE DRAINAGE MAP

- North arrow and scale
- Stationing along baselines
- Ramp baselines with nomenclature
- Begin and end bridge stationing
- Preliminary interchange configuration
- R/W lines
- Preliminary interchange drainage with drainage areas and flow direction arrows

TYPICAL SECTIONS

- Mainline and crossroad typical sections
- R/W lines
- Special details (e.g., bifurcated sections, high fills)
- Traffic data

PROJECT LAYOUT

- Plan-profile sheet sequence (mainline and crossroads)

PROJECT CONTROL

- Benchmarks
- Reference points
- Control points

PLAN AND PROFILE - PLAN VIEW

- North arrow and scale
- Baseline of survey, equations
- Curve data (including superelevation)
- Existing topography including utilities
- Preliminary horizontal geometrics/dimensions
- Existing & proposed R/W lines (if available)
- Centerline of construction (if different from the baseline of survey)
- Begin and end stations for the project, bridges, bridge culverts and exceptions

PLAN AND PROFILE - PROFILE VIEW

- Scale
- Appropriate existing utilities
- Bench mark information
- Preliminary profile grade line
- Equations
- Existing ground line with elevations at each end of sheet
- Begin and End Stations for the Project, bridges, bridge culverts and exceptions.

SPECIAL PROFILE

- Scale
- Ramp profile worksheet including nose sections
- Existing ground line of intersections
- Preliminary grade line of intersections
- Preliminary curb return profiles, if applicable

BACK - OF - SIDEWALK PROFILE (Worksheet)

- Scale
- Begin and end project stations
- Begin and end sidewalk stations
- Cross street locations and elevations
- Drainage flow direction arrows
- Mainline equations
- Existing driveway locations and details
- Superelevation details
- Back of sidewalk profile grades and vertical curve information
- Building floor elevations with offset distance left and right
- Graseline notation: Specifically the numeric difference relative to roadway profile gradeline

INTERCHANGE DETAIL

- North arrow and scale
- Schematic of traffic flow and volumes
- Proposed bridge limits
- R/W lines
- Preliminary configuration and geometrics
- Quadrant Identification
- Ramp Labels

INTERSECTION LAYOUT

- North arrow and scale
- Existing topography (if applicable)
- Proposed R/W limits
- Length of turn lanes
- Taper lengths
- Existing Utilities
- Geometric dimensions (radii, offsets, widths)

CROSS SECTIONS

(May require accompanying cross section pattern sheet)

- Scale
- Existing ground line
- Existing survey baseline elevations
- Station numbers
- Baseline of survey labeled
- Existing utilities
- Proposed template with profile grade elevations along mainline and cross-streets

TEMPORARY TRAFFIC CONTROL PLANS

- Project specific
- Other worksheets as necessary to convey concept and scope

LANDSCAPE PLANS

- Conceptual landscape plan

LANDSCAPE OPPORTUNITY PLAN

- North Arrow and Scale
- Drainage divides and ground elevations (if available)
- Drainage areas and flow direction arrows
- Street names
- Baseline of Survey
- Begin & end stations of project, construction and exceptions
- Existing to remain or proposed roadway improvements, structures and drainage facilities with relevant information
- Existing off-site features and conditions that affect or are affected by the project
- Edge of pavement and traffic lanes
- Curbs or curb and gutter
- Guardrails
- R/W or limited access fence line and gate locations
- Sidewalks or other planned or existing structures
- Lighting, signs, signal poles and ITS facilities

LANDSCAPE OPPORTUNITY PLAN (cont.)

- Existing and proposed overhead or underground utilities
- Clear Zone/Lateral offset (plotted and noted frequently on each plan sheet)
- Limits of clear sight
- Transit facilities Outdoor advertising signs and view zones
- Proposed areas reserved for landscape improvements (shown in bubble diagram format)
- Proposed Plant Palette
- Notes
- for permitted outdoor advertising signs

VEGETATION TREE DISPOSITION PLAN

- North Arrow and Scale
- Drainage divides and ground elevations (if available)
- Drainage areas and flow direction arrows
- Street names
- Baseline of Survey or Project Centerline
- Begin & end stations of project, construction and exceptions
- Existing to remain or proposed roadway improvements, structures and drainage facilities with relevant information
- Existing off-site features and conditions that affect or are affected by the project
- Edge of pavement and traffic lanes
- Curbs or curb and gutter
- Guardrails
- R/W or limited access fence line and gate locations
- Sidewalks or other planned or existing structures
- Lighting, signs, signal poles, and ITS facilities
- Existing and proposed overhead or underground utilities
- Transit facilities
- Details for vegetation removal and pruning
- Vegetation Relocation Plan
- Notes

301.2.2 Phase II Submittal

Typically, the work to be done during this phase is the following:

- (1) Address Phase I comments.
- (2) Load Pay Item numbers into the Designer Interface for AASHTOWare Project Preconstruction™. Refer to the [Basis of Estimates](#) for additional guidance.
- (3) Identify specifications, including any needed modified or project specific changes. Refer to the [Specifications Handbook](#) for additional guidance.
- (4) Develop Phase II Plans to include the following:

KEY SHEET

- Index of sheets
- Contract plans and component plans list

SIGNATURE SHEET

- Sections for each Professional of Record
- Index of sheets for each Professional of Record
- Image of the seal(s)
- Appearance of the Digital Signature only to be applied in Phase IV
- (Note: Digital Signatures are not to be applied in this Phase)

DRAINAGE MAP - PLAN VIEW

- Proposed structures with structure numbers
- Proposed storm drain pipes
- Flow arrows along proposed ditches
- Retention/Detention ponds, pond number and area size
- Cross drains with pipe sizes and structure numbers
- Bridges/bridge culverts with begin and end stations
- Flood data (if applicable)

DRAINAGE MAP - PROFILE VIEW

- Ditch gradients including DPIs
- Final roadway profile grade line
- Mainline storm drain pipes
- Mainline flow line elevations
- Mainline structures with structure numbers and pipes
- Bridge, Bridge Culvert
- Cross drains with pipe sizes, structure numbers and flow line elevation

OPTIONAL MATERIALS TABULATION

- Material type
- Structure number station and description
- Durability, cover requirements
- Optional culvert material application
- Culvert service life estimator
- Design service life

PROJECT LAYOUT

- Complete

PROJECT CONTROL

- Complete

PLAN AND PROFILE - PLAN VIEW

- Curb return numbers, station ties and elevations
- Proposed drainage structures with structure no.
- Proposed R/W lines
- Existing utilities
- Proposed side drain pipe requirements (including size) for access and intersections
- Final geometrics and dimensions including radii, station pluses, offsets, widths, taper/transition lengths, curve data
- General Notes (if General Notes Sheet not included)
- Flood data if not shown elsewhere
- Limits of wetlands

PLAN AND PROFILE - PROFILE VIEW

- Final profile grades and vertical curve data
- Mainline storm drain pipes
- Proposed special ditches
- Ditch gradients with DPI station and elevation
- Nonstandard superelevation transition details
- High water elevations
- Existing utilities
- Mainline drainage structures with structure numbers
- Cross drains with structure number, size and flow line elevations

TRAFFIC MONITORING SITE

- Project Specific

INTERCHANGE DRAINAGE MAP

- Final geometrics including PC and PT
- Proposed structures with structure numbers
- Proposed storm drain pipes
- Special ditches with DPI and elevation

TYPICAL SECTIONS

- Pavement Design

SPECIAL PROFILE

- Final intersection profile grades
- Final curb return profiles (if applicable)
- Superelevation diagrams as required
- Final ramp profile grades including nose sections
- Preliminary access and frontage road profiles (may contain one or more types of special profiles.)

BACK OF SIDEWALK PROFILE

- Complete

INTERCHANGE LAYOUT

- Curve data including superelevation and design speed
- Coordinate data, stationing and ties
- Access and frontage roads with dimensions and R/W
- Fence location
- Ramp identification

RAMP TERMINAL DETAILS

- Preliminary geometrics
- Radii, transition/taper lengths
- Ramp identification

INTERSECTION LAYOUT

- Limits of proposed construction on side roads
- Applicable notes
- Cross drains with structure numbers and pipe sizes
- Storm drain pipes including sizes
- Final geometrics including dimensions, radii, offsets, station pluses and taper/transition lengths

DRAINAGE STRUCTURES

- Vertical and horizontal scale
- Roadway template with profile grade elevation
- Underground utilities
- Special sections at conflict points
- R/W lines (at critical locations)
- Storm drain construction notes
- Flow arrows
- Applicable notes
- Structure numbers and location station along right side of sheet
- Drainage structures with number, type, size, location and flowline elevations

OUTFALL / LATERAL DITCH - PLAN VIEW

- North arrow and scale
- Roadway centerline
- Existing or survey ditch centerline
- Proposed ditch centerline with stationing
- Begin and end ditch stations
- Equations
- Ditch centerline intersection stations
- R/W lines
- Bearings of ditch and mainline centerlines
- Proposed storm drain pipes
- Ditch PI stations with deflection angle left or right
- Proposed drainage structures with structure numbers
- Existing topography, drainage structures, utilities
- Limits of wetlands

OUTFALL / LATERAL DITCH - PROFILE VIEW

- Bench mark information
- Scale
- Existing ground line
- Proposed ditch profile with grades
- Begin and end ditch stations
- High water elevations
- Proposed storm drain pipes with size
- Existing Utilities
- Overland flow or overtopping elevations
- Proposed drainage structures with structure numbers
- Typical section can be placed in either plan or profile

LATERAL DITCH CROSS SECTIONS

- Horizontal and vertical scale
- Existing ground line
- Station numbers
- Survey centerline and elevation
- R/W
- Begin and end ditch stations
- Begin and end excavation stations
- Existing utilities
- Proposed template with ditch bottom elevation

RETENTION/DETENTION POND DETAILS

- North arrow and scale
- Roadway centerline ties
- Proposed pond centerline with stationing
- Begin and end pond stations
- Side slopes, dimensions, and elevations
- R/W lines
- Berm, fence and gate locations
- Soil boring information
- Proposed pond drainage structures with structure numbers
- Existing topography, drainage structures, utilities
- Pond sections (2 perpendicular to each other)
- Pond Typical Section
- Limits of wetlands

RETENTION/DETENTION POND CROSS SECTIONS

- Horizontal and vertical scale
- Existing ground line
- Station numbers
- Begin and end pond stationing
- Pond centerline and elevations
- R/W
- Soil borings
- Water table
- Extent of unsuitable material
- Existing utilities
- Proposed template with bottom elevation

CROSS SECTION PATTERN

- North arrow and scale
- Interchange layout
- Access and frontage roads
- Mainline and ramp stationing
- Begin and end bridge stations
- Cross section location lines
- Ramp baselines with nomenclature and stationing

ROADWAY SOIL SURVEY

- Soil data
- Project specific

CROSS SECTIONS

- R/W
- Special ditch bottom elevations
- Equivalent stations for ramps and mainline
- Mainline equation stations
- Soil borings
- Water table
- Extent of unsuitable material
- Proposed template with profile grade elevation
- Earthwork Columns
- Begin and end stationing for project, construction and earthwork, bridge and bridge culvert
- Existing utilities affected by the template and where unsuitable materials are present

STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

- Narrative Description (with supplemental topographic maps, when used)

TEMPORARY TRAFFIC CONTROL PLANS

- Preliminary traffic control plan
- Detour plan
- Phasing plan
- R/W - existing and additional if required
- Existing Utilities

UTILITY ADJUSTMENTS

- All existing utilities highlighted

SELECTIVE CLEARING AND GRUBBING

- Existing vegetation to be protected, relocated or removed
- Notes
- Details
- Project Specific

MITIGATION PLANS

- Project Specific

MISCELLANEOUS STRUCTURES PLANS

- Retaining walls (Cast in place, proprietary, temporary) if required

SIGNING AND PAVEMENT MARKING PLANS - KEY SHEET

- Financial Project ID
- (Federal Funds) notation, if applicable
- State Road Number
- County Name
- FDOT Project Manager's Name
- Begin/end stations & exceptions
- Station Equations (if location map is shown)
- Engineer of Record
- Consultants name & address, if applicable

SIGNING AND PAVEMENT MARKING PLANS - PLAN SHEETS

- North arrow and scale
- Basic Roadway Geometrics
- Begin/End Stations and Exceptions
- Station equations
- Conflicting utilities, lighting or drainage
- Pavement markings
- Sign locations
- Applicable pay items

SIGNING AND PAVEMENT MARKING PLANS - SIGN DETAIL SHEETS, GUIDE SIGN WORK SHEETS

- Project Specific

SIGNALIZATION PLANS - KEY SHEET

- Financial Project ID
- (Federal Funds) notation, if applicable
- State Road Number
- County Name
- FDOT Project Manager's Name
- Begin/end stations & exceptions
- Station Equations (if location map is shown)
- Engineer of Record
- Consultants name & address, if applicable

SIGNALIZATION PLANS - PLAN SHEET

- North arrow and scale
- Basic Roadway Geometrics
- Begin/End Stations and Exceptions
- Station Equations
- Conflicting utilities, lighting or drainage
- Signal Pole Location
- Type and location of loops
- Type and location of signal heads
- Pedestrian Signals including stations and offsets
- Location of Stop Bars
- Location of Pedestrian Crosswalks
- Sheet Title
- Applicable pay items

SIGNALIZATION PLANS - POLE SCHEDULE

- Pole location, number, type
- Pole dimensions
- Pay item number
- Joint use pole details, if applicable
- Foundation design

SIGNALIZATION PLANS - INTERCONNECT/ COMMUNICATION CABLE PLAN

- Placement of interconnect/communication cable
- Conflicting utilities, lighting or drainage
- Other project specific details

ITS PLANS - KEY SHEET

- Financial Project ID
- (Federal Funds) notation, if applicable
- State Road Number
- County Name
- FDOT Project Manager's Name
- Begin/end stations & exceptions
- Station Equations (if location map is shown)
- Engineer of Record
- Consultants name & address, if applicable

ITS PLANS - PLAN SHEETS

- Project Specific, but must include:
 - North arrow and scale
 - Basic Roadway Geometrics
 - Begin/End Stations and Exceptions
 - Station equations
 - Conflicting utilities, lighting or drainage
 - Applicable pay items

ITS PLANS - DETAIL SHEETS

- Project Specific

LIGHTING PLANS - KEY SHEET

- Financial Project ID
- (Federal Funds) notation, if applicable
- State Road Number
- County Name
- FDOT Project Manager's Name
- Begin/end stations & exceptions
- Station Equations (if location map is shown)
- Engineer of Record
- Consultants name & address, if applicable

LIGHTING PLANS - POLE DATA AND LEGEND SHEET

- Each pole by number with location, arm length, mounting height and luminaire wattage noted.
- Design value for light intensities and uniformity ratios shown.
- Legend and sheet title

LIGHTING PLANS - PLAN SHEETS

- North arrow and scale
- Basic Roadway Geometrics
- Begin/End Stations and Equations
- Station Equations
- Conflicting utilities, drainage, signal poles, etc.
- Sheet title
- Applicable pay items
- Pole symbols shown at correct station location and approximate offset

LIGHTING PLANS - HIGH MAST

- Foundation detail sheets (project specific)
- Boring data sheets (project specific)
- Conflicting utilities, drainage, lighting

LANDSCAPE PLANS - KEY SHEET

- Financial Project ID
- (Federal Funds) notation, if applicable
- Fiscal year and sheet number
- State Road Number
- County Name
- FDOT Project Manager's Name
- Begin/end stations & exceptions
- Station Equations (if location map is shown)
- Landscape Architect of Record name and registration number
- Consultants name, address, and contract number, if applicable
- Index of landscape plans

LANDSCAPE PLANS - PLANT SCHEDULE

- Project Specific

LANDSCAPE PLANS - SCHEDULE FOR IRRIGATION AND SITE AMENITIES

- Project Specific

LANDSCAPE PLANS – PLANTING PLAN SHEETS

- Project centerline
- Edge of pavement (edge of traffic lanes)
- Curbs or curb and gutter
- Drainage systems
- Guardrails
- Right of way and/or limited access fence line
- Sidewalks or other planned or existing structures
- Lighting, signs, and signal poles
- Intersections and driveways which are noted in the plans
- Existing and proposed overhead and underground utility locations
- Clear Zone/Lateral offset (should be plotted or safety setback distances noted frequently on each plan sheet)
- View zones for permitted outdoor advertising signs
- Canopy limits
- Existing vegetation (to remain or be removed)

- Existing off site features and conditions that affect or are affected by the project
- Fence and gate locations
- Setbacks from structural elements or drainage system
- Limits of clear sight
- Transit facilities
- Proposed Planting Plan (Plant symbols)

LANDSCAPE PLANS - IRRIGATION PLAN SHEETS (if applicable)

- Type of system
- Location and size of mainlines and lateral lines
- Type and location of spray heads and rotors
- Type and location of valves, sleeves, controllers, water sources/point of connection, backflow preventers, and isolation valves

LANDSCAPE PLANS – DETAILS SHEET

- Applicable landscape details
- Irrigation symbology with associative descriptions (if applicable)

301.2.3 Phase III Submittal

Typically, the work to be done during this phase is the following:

- (1) Address Phase II comments.
- (2) Complete all remaining Plan Sheets.
- (3) Submit Technical Special Provisions or Modified Special Provisions for technical and legal review(s).
- (4) Complete the Estimated Quantities Report in **FDM 902** and input quantities into Designer Interface for AASHTOWare Project Preconstruction™. Submit the Estimated Quantities Report with the Phase III Submittal.

Estimate the Work Zone Traffic Control items paid for on a 'per day' basis and include them in the Phase III submittal. The Department's construction office will perform a biddability review and will establish construction duration as a part of the Phase III review after receiving the plan set. This information should be included in the Phase III review comments transmitted back to the Engineer of Record (EOR).

Utility Work by Highway Contractor (UWHC) Agreement Plans, consisting of a key sheet, and mainline plan-profile showing proposed utility horizontal and vertical locations, are also to be included in the Phase III submittal.

Review comments must be provided to the EOR for incorporation of the comments into the plans. When the review comments have been resolved and documented by the designer, the plans are ready to proceed to completion.

301.2.4 Phase IV Submittal

Typically, the work to be done during this phase is the following:

- (1) Address Phase III review comments,
- (2) Update Work Zone Traffic Control and Litter Removal & Mowing pay items based on established construction duration and finalize the Estimated Quantities Report,
- (3) Place the assigned Construction Contract number on the Key Sheet(s),
- (4) Update the Work Program Administration (WPA) system (see **FDM 111.2.1**) to reflect the project begin and end project milepost,
- (5) Prepare Draft Specification Package.

- (6) Finalize the Estimated Quantities Report and update quantities in Designer Interface for AASHTOWare Project Preconstruction™. Submit the Estimated Quantities Report with the Phase IV Submittal.
- (7) Provide an Engineer of Record's construction cost estimate to the Department Project Manager (when requested).

After corrections noted during the Phase IV submittal review are completed and verified, the plans are referred to as Final Plans.

301.2.5 PS&E Phase Submittals

There are two required submittals during the Plans, Specifications, and Estimates (PS&E) phase. Coordinate with the District Final Plans Office for scheduling these required submittals.

The first submittal consists of the Final Plans, draft Specifications Package, and PDF of the Estimated Quantities Report. See the [Specifications Handbook](#) for information on preparing Specifications Packages.

A review of the first submittal by the District Final Plans Office often requires changes; e.g., pay item numbers and quantities, notes, design details.

After changes to the Final Plans, Specifications Package and Estimated Quantities Report have been completed and verified, deliver the second submittal consisting of the following:

- (1) Signed and Sealed Plans
- (2) Signed and Sealed Specifications Package
- (3) Signed and Sealed Estimated Quantities Report
- (4) CADD Files

At the time of the second submittal, provide to the Department Project Manager the following:

- Total Roadway Length
- Total Bridge Length
- Total Project Length
- Project Documentation

Additional information on District activities during PS&E Phase is described in **FDM 131**.

Information on the delivery of Project Documentation is described in **FDM 111.7**.

301.3 Design-Build Phase Submittals

FDM 301.3 applies exclusively to Design-Build projects. Requirements relating to the design process for various submittals are given in **FDM 120**. Refer to that chapter for additional guidance in preparing submittals for review by the Department. For bridge submittal requirements see **FDM 121**. For Design-Build projects, the standard submittal phases are:

- (1) Technical Proposal
- (2) 90% Component Plans
- (3) Final Component Plans

Table 301.3.1 summarizes the plans sheet status required for each submittal.

An additional sheet titled "Notes for Reviewers" may be placed as the second sheet in the submittal package to call attention to conditions, issues and features unique to the project design. The sheet is to be used only in the review process and is not included in the final plans.

301.3.1 Direction to All Discipline Phase Reviewers on Non-Conventional Projects

Discipline phase reviewers should primarily review Design-Build and Public-Private-Partnership project plan submittals for compliance with contract requirements. However, non-contractual comments submitted "for information only" can also provide valuable feedback to the Design-Build Firm or Concessionaire. The purpose of this section is to allow a formal process for submitting both types of comments on Non-Conventional Projects.

Discipline phase reviewers must separate component plan review comments into the following two categories:

- **Response Required Comment:** these refer to direct violations of the Contract
- **FYI Comment:** these do not refer to direct violations of the Contract

The discipline phase reviewer should enter comments in the Electronic Review Comments (ERC) system in the boxes labeled “Response Required Comment” or “FYI Comment” as appropriate. The ERC system will automatically add a statement at the end of each comment indicating “A written response is required.” or “This comment is for information only. A written response is NOT required.”

301.3.1.1 Response Required Comment

Response Required Comments refer to direct violations of the Contract. These comments require a written response by the Design-Build Firm or Concessionaire. Where possible, the reviewer is expected to include the specific contract reference or requirement that is being violated. Examples may include, but are not limited to:

- an **AASHTO** provision that is being violated;
- a Governing Regulation (e.g., **FDM, Structures Design Guidelines**) requirement that is being violated;
- a Technical Proposal commitment that is not being met;
- a Request For Proposal (RFP) requirement that is being omitted or violated;
- omission in the plans or calculations;
- inconsistencies between the plans and calculations;
- obvious errors in math or basic engineering principles;
- an environmental commitment or permit commitment that is not being met.

*Example Comment: The vertical curve length does not meet the minimum requirements of **Table 210.10.4** in the **FDM**. A written response is required.*

In this example, a requirement from the **FDM** is being violated. The plans must be corrected to address this situation, and a written response from the Design-Build Firm or Concessionaire is required.

Example Comment: Calculations are consistent with two-phased post tensioning of the pier cap, but the plans indicate post-tensioning in a single phase. Update plans to be consistent with the calculations so that the cap will not be overstressed in the unloaded condition. A written response is required.

In this example, the intent of the comment is to alert the Design-Build Firm or Concessionaire of an inconsistency between the calculations and the plans that result in the pier cap being overstressed. The plans must be corrected to address this situation, and a written response from the Design-Build Firm is required.

301.3.1.2 FYI Comment

FYI Comments are those that do not refer to direct violations of the Contract. These comments do not require a written response by the Design-Build Firm or Concessionaire. At the end of each comment state that the comment is for information only and a written response is not required.

Example Comment: The plans as submitted depict a land pier located very close to the shoreline of a major body of water and steel sheet piling are not shown along the water face of the footing. Ensure that the footing can be constructed in the dry per the requirements of the Specifications. This comment is for information only. A written response is NOT required.

In this example, the intent of the comment is to ensure that the footing concrete is placed in the dry per the [Standard Specifications](#). Regardless of the action the Design-Build Firm or Concessionaire takes in response to the comment, the [Standard Specifications](#) requirements must be met; the reviewer is putting the Design-Build Firm or Concessionaire on notice.

Table 301.3.1 Summary of Design-Build Phase Submittals

Provide the sheets listed as applicable

<u>ITEM</u>	<u>TECHNICAL PROPOSAL</u>	<u>90% PLANS</u>	<u>FINAL PLANS</u>
Key Sheet		P	F
Signature Sheet		P	F
Drainage Map	P	C	F
Interchange Drainage Map	P	C	F
Typical Section	P	C	F
Project Layout		C	F
Project Control	P	C	F
Roadway Plan and Profile	P	C	F
Traffic Monitoring Site	P	C	F
Special Profile		C	F
Back-of-Sidewalk Profile		C	
Interchange Layout	P	C	F
Intersection Layout/Detail	P	C	F
Drainage Structures		C	F
Outfall/Lateral Ditch Plan Profile		C	F
Outfall/Lateral Ditch Cross Section		C	F
Retention/Detention Pond Details		C	F
Roadway Soil Survey		C	F
Cross Sections		C	F
Temporary Traffic Control Plans	P	C	F
Utility Adjustments		C	
Selective Clearing and Grubbing		C	
Developmental Standard Plans		C	F
Mitigation Plans		C	F
Miscellaneous Structures Plans		C	F
Signing and Pavement Marking Plans	P	C	F
Signalization Plans		C	F
Intelligent Transportation System (ITS) Plans		C	F
Lighting Plans		C	F
Landscape Plans		C	F
Vegetation-Tree Disposition Plan		C	F
Utility Work by Highway Contractor Agreement Plans		C	F
Toll Facility Plans			
Site/Civil	P	P	F
Architectural	P	P	F
Structural	P	P	F
Electrical		P	F
Mechanical		P	F
Plumbing		P	F
Communications		P	F
Systems		P	F

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

301.3.2 Technical Proposal Submittal Requirements

Submit a complete set of 11" X 17" plan sheets for the Technical Proposal Submittal. As a supplement to the plan set, select plan sheets, no larger than 24" X 36" or roll plot(s) no larger than 24" X 96", may be submitted. Supplemental plan sheets or roll plots are desirable for such roadway features that cannot be presented adequately on 11" X 17" sheets; e.g., complex interchanges, Maintenance of Traffic phases, large complex intersections. Unless otherwise directed by the Department, the following elements are required for a Technical Proposal Submittal:

DRAINAGE MAP - PLAN VIEW

- Drainage divides and flow direction arrows
- High water information as required
- Preliminary horizontal alignment with stationing
- State, Federal, County highway numbers (as appropriate)
- Proposed storm drain trunk line and outfall locations
- Proposed Retention/Detention Pond Location

INTERCHANGE DRAINAGE MAP - PLAN VIEW

- Preliminary interchange drainage with drainage areas and flow direction arrows

TYPICAL SECTIONS

- Mainline and crossroad typical sections
- R/W lines
- Traffic data
- Pavement Design

PROJECT CONTROL

- Benchmarks
- Reference Points
- Control Points

PLAN AND PROFILE - PLAN VIEW

- North arrow and scale
- Baseline of survey, equations
- Curve data (including superelevation)
- Existing topography including utilities
- Preliminary horizontal geometrics/dimensions
- Existing & proposed R/W lines (if available)
- Centerline of construction (if different from the baseline of survey)
- Begin and end stations for the project and stations of equations and exceptions
- Existing utilities
- Guide sign locations
- Limits of wetlands

PLAN AND PROFILE - PROFILE VIEW

- North arrow and scale
- Appropriate existing utilities
- Preliminary profile grade line
- Existing ground line with elevations at each end of sheet
- Begin and end stations for the project and stations of equations and exceptions
- Final profile grades and vertical curve data
- High water elevations

TRAFFIC MONITORING SITE

- Project Specific

INTERCHANGE LAYOUT

- Curve data including superelevation and design speed
- Stationing and ties
- Access or frontage roads with dimensions and R/W
- Ramp identification

INTERSECTION LAYOUT

- North arrow and scale
- Existing topography (if applicable)
- Proposed R/W limits
- Length of turn lanes
- Geometric dimensions (radii, offsets, widths)
- Limits of proposed construction along side roads

TEMPORARY TRAFFIC CONTROL PLANS

- Project specific
- Other worksheets as necessary to convey concept and scope
- Preliminary traffic control plan
- Detour plan
- Phasing plan
- R/W – existing and additional if required

SIGNING AND PAVEMENT MARKING PLANS - SIGN DETAIL SHEETS

- Preliminary layout of multi-column and overhead guide sign worksheets

TOLL FACILITY PLANS

- Site/Civil
- Architectural
- Structural

301.3.3 90% Plans Component Submittal Requirements

The Department may provide review comments and mark-ups to the EOR for incorporation into the plan set. The Department may allow the EOR to include sketches of details or revised plan sheets along with their written responses to some review comments, in lieu of resubmitting a component plan set. The EOR will upload these sketches or revised plan sheets into the ERC system.

Unless otherwise directed by the Department, the following elements are required for a 90% Plans Component Submittal:

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 and scale
- 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)
- Index of sheets
- Contract plans and component plans list

SIGNATURE SHEET

- Sections for each Professional of Record
- Index of sheets for each Professional of Record
- Image of the seal(s)
- (Note: Digital Signatures are not to be applied in this Phase)

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, bridge, bridge culverts & exceptions
- Existing structures & pipes with relevant information
- Proposed structures with structure numbers
- Proposed storm drain pipes
- Flow arrows along proposed ditches
- Retention/Detention ponds, pond number and area size
- Cross drains with pipe sizes and structure numbers
- Bridges/bridge culverts with begin and end stations
- Flood data (if applicable)
- State, Federal, county highway numbers (as appropriate)

DRAINAGE MAP - PROFILE VIEW

- Horizontal & vertical scale
- Begin & end stations of project, bridges, bridge culverts & exceptions
- Equations
- Ditch gradients including DPIs
- Final roadway profile grade line
- Mainline storm drain pipes
- Mainline flow line elevations
- Mainline structures with structure numbers and pipes
- Bridge, Bridge Culvert
- Cross drains with pipe sizes, structure numbers and flow line elevation

INTERCHANGE DRAINAGE MAP

- North arrow and scale
- Stationing along baselines
- Ramp baselines with nomenclature
- Begin and end bridge stationing
- Final interchange configuration
- R/W lines
- Final Interchange drainage with drainage areas and flow direction arrows
- Final geometrics including PC and PT
- Proposed structures with structure numbers
- Proposed storm drain pipes
- Special ditches with DPI and elevation

TYPICAL SECTIONS

- Mainline and crossroad typical sections
- R/W lines
- Special details (e.g., bifurcated sections, high fills)
- Traffic data
- Pavement Design

PROJECT LAYOUT

- Plan-profile sheet sequence (mainline and crossroads)

PROJECT CONTROL

- Complete

ROADWAY PLAN PROFILE - PLAN VIEW

- North arrow and scale
- Baseline of survey, equations
- Curve data (including superelevation)
- Existing topography including utilities
- Preliminary horizontal geometrics/dimensions
- Existing & proposed R/W lines (if available)
- Centerline of construction (if different from the baseline of survey)
- Begin and end stations for the project, bridges, bridge culverts and exceptions
- Reference points (if project survey control sheet not included in plans set)
- Curb return numbers, station ties and elevations
- Proposed drainage structures with structure nos.
- Proposed R/W lines
- Existing utilities
- Limits of wetlands
- Flood data if not shown elsewhere
- Proposed side drain pipe requirements (including size) for access and intersections
- Final geometrics and dimensions including radii, station pluses, offsets, widths, taper/transition lengths, curve data
- General notes (if project layout sheet not included)

ROADWAY PLAN PROFILE - PROFILE VIEW

- Begin and end stations for the project and stations of equations and exceptions
- Existing ground line with elevations at each end of sheet
- Final profile grades and vertical curve data
- High water elevations
- Appropriate existing utilities
- Mainline storm drain pipes
- Proposed special ditches
- Ditch gradients with DPI station and elevation
- Non-standard superelevation transition details

- High water elevations
- Mainline drainage structures with structure numbers
- Cross drains with structure number, size and flow line elevations

TRAFFIC MONITORING SITE

- Project Specific

SPECIAL PROFILE

- Scale
- Existing ground line of intersections
- Final intersection profile grades
- Final curb return profiles (if applicable)
- Superelevation diagrams as required
- Final ramp profile grades including nose sections
- Final access and frontage road profiles (may contain one or more types of special profiles.)

BACK-OF-SIDEWALK PROFILE

- Scale
- Begin and end project stations
- Begin and end sidewalk stations
- Cross-street locations and elevations
- Drainage flow direction arrows
- Mainline equations
- Existing driveway locations and details
- Superelevation details
- Back-of-sidewalk profile grades and vertical curve information
- Building floor elevations with offset distance left and right
- Grade line notation: Specifically the numeric difference relative to roadway profile grade line

INTERCHANGE LAYOUT

- North arrow and scale
- Quadrant Identification
- Ramp Labels
- Schematic of traffic flow and volumes
- Proposed bridge limits
- R/W lines
- Final configuration and geometrics
- Curve data including superelevation and design speed
- Coordinate data, stationing and ties
- Access and frontage roads with dimensions and R/W
- Fence location

RAMP TERMINAL DETAILS

- Ramp identification
- Final geometrics
- Radii, transition/taper lengths

INTERSECTION LAYOUT

- North arrow and scale
- Existing topography (if applicable)
- Proposed R/W limits
- Length of turn lanes
- Taper lengths
- Existing Utilities
- Geometric dimensions (radii, offsets, widths)
- Limits of proposed construction on side roads
- Applicable notes
- Cross drains with structure numbers and pipe sizes
- Storm drain pipes including sizes
- Final geometrics including dimensions, radii, offsets, station pluses and taper/transition lengths

DRAINAGE STRUCTURES

- Vertical and horizontal scale
- Roadway template with profile grade elevation
- Underground utilities
- Special sections at conflict points
- R/W lines (at critical locations)
- Storm drain construction notes
- Flow arrows
- Applicable notes
- Structure numbers and location station along right side of sheet
- Drainage structures with numbers in numerical order, type, size, location and flow line elevations

OUTFALL / LATERAL DITCH - PLAN VIEW

- North arrow and scale
- Roadway centerline
- Existing and survey ditch centerline
- Proposed ditch centerline with stationing
- Begin and end ditch stations
- Equations
- Ditch centerline intersection stations
- R/W lines
- Bearings of ditch and mainline centerlines
- Proposed storm drain pipes
- Ditch PI stations with deflection angle left or right
- Proposed drainage structures with structure numbers
- Existing topography, drainage structures, utilities
- Limits of wetlands

OUTFALL / LATERAL DITCH - PROFILE VIEW

- Bench mark information
- Scale
- Existing ground line
- Proposed ditch profile with grades
- Begin and end ditch stations
- High water elevations
- Proposed storm drain pipes with size
- Existing Utilities
- Overland flow or overtopping elevations
- Proposed drainage structures with structure numbers
- Typical section can be placed in either plan or profile

LATERAL DITCH CROSS SECTIONS

- Horizontal and vertical scale
- Existing ground line
- Station numbers
- Survey centerline and elevation
- R/W
- Begin and end ditch stations
- Begin and end excavation stations
- Existing utilities
- Proposed template with ditch bottom elevation

RETENTION/DETENTION POND DETAILS

- North arrow and scale
- Roadway centerline ties
- Proposed pond centerline with stationing
- Begin and end pond stations
- Side slopes, dimensions, and elevations
- R/W lines
- Berm, fence and gate locations
- Soil boring information
- Proposed pond drainage structures with structure numbers
- Existing topography, drainage structures, utilities
- Pond sections (2 perpendicular to each other)
- Pond Typical Section
- Limits of wetlands

RETENTION/DETENTION POND CROSS SECTIONS

- Horizontal and vertical scale
- Existing ground line
- Station numbers
- Begin and end pond stationing
- Pond centerline and elevations
- R/W
- Soil borings
- Water table
- Extent of unsuitable material
- Existing utilities
- Proposed template with bottom elevation

ROADWAY SOIL SURVEY

- Soil data
- Project specific

CROSS SECTIONS

- Scale
- Existing ground line
- Existing survey baseline elevations
- Station numbers
- Baseline of survey labeled
- Existing utilities
- Proposed template with profile grade elevations along mainline and cross-streets as necessary

TEMPORARY TRAFFIC CONTROL PLANS

- Project specific
- Other worksheets as necessary to convey concept and scope.
- Final traffic control plan
- Detour plan
- Phasing plan
- R/W - existing and additional if required
- Existing Utilities

UTILITY ADJUSTMENTS

- All existing utilities highlighted

SELECTIVE CLEARING AND GRUBBING

- Limits of construction by station and type of selective clearing and grubbing

MITIGATION PLANS

- Project Specific

MISCELLANEOUS STRUCTURES PLANS

- Retaining walls (Cast in place, proprietary, temporary) if required

SIGNING AND PAVEMENT MARKING PLANS - KEY SHEET

- Financial Project ID
- (Federal Funds) notation, if applicable
- State Road Number
- County Name
- Department's Project Manager's Name
- Begin/end stations & exceptions
- Station Equations (if location map is shown)
- Engineer of Record
- Consultants name & address, if applicable

SIGNING AND PAVEMENT MARKING PLANS - PLAN SHEETS

- North arrow and scale
- Basic Roadway Geometrics
- Begin/End Stations and Exceptions
- Station equations
- Conflicting utilities, lighting or drainage
- Pavement markings
- Sign locations

GUIDE SIGN WORK SHEETS

- Project Specific

SIGNALIZATION PLANS - KEY SHEET

- Financial Project ID
- (Federal Funds) notation, if applicable
- State Road Number
- County Name
- Department's Project Manager's Name
- Begin/end stations & exceptions
- Station Equations (if location map is shown)
- Engineer of Record
- Consultants name & address, if applicable

SIGNALIZATION PLANS - PLAN SHEET

- North arrow and scale
- Basic Roadway Geometrics
- Begin/End Stations and Exceptions
- Station Equations
- Conflicting utilities, lighting or drainage
- Signal Pole Location
- Type and location of loops
- Type and location of signal heads
- Pedestrian Signals including stations and offsets
- Location of Stop Bars
- Location of Pedestrian Crosswalks
- Sheet Title

SIGNALIZATION PLANS - POLE SCHEDULE

- Pole location, number, type
- Pole dimensions
- Joint use pole details, if applicable
- Foundation design

SIGNALIZATION PLANS - INTERCONNECT/ COMMUNICATION CABLE PLAN

- Placement of interconnect/communication cable
- Conflicting utilities, lighting or drainage
- Other project specific details

ITS PLANS - KEY SHEET

- Financial Project ID
- (Federal Funds) notation, if applicable
- State Road Number
- County Name
- Department's Project Manager's Name
- Begin/end stations & exceptions
- Station Equations (if location map is shown)
- Engineer of Record
- Consultants name & address, if applicable

ITS PLANS - PLAN SHEETS

- Project Specific, but must include:
- North arrow and scale
- Basic Roadway Geometrics
- Begin/End Stations and Exceptions
- Station equations
- Conflicting utilities, lighting or drainage

ITS PLANS - DETAIL SHEETS

- Project Specific

LIGHTING PLANS - KEY SHEET

- Financial Project ID
- (Federal Funds) notation, if applicable
- State Road Number
- County Name
- Department's Project Manager's Name
- Begin/end stations & exceptions
- Station Equations (if location map is shown)
- Engineer of Record
- Consultants name & address, if applicable

LIGHTING PLANS - POLE DATA AND LEGEND SHEET

- Each pole by number with location, arm length, mounting height and luminaire wattage
- Design value for light intensities and uniformity ratios shown
- Legend and sheet title

LIGHTING PLANS - PLAN SHEETS

- North arrow and scale
- Basic Roadway Geometrics
- Begin/End Stations and Equations
- Station Equations
- Conflicting utilities, drainage, signal poles
- Sheet title
- Pole symbols shown at correct station location and approximate offset

LIGHTING PLANS - HIGH MAST

- Foundation detail sheets (project specific)
- Boring data sheets (project specific)
- Conflicting utilities, drainage, lighting

LANDSCAPE PLANS – KEY SHEET

- Financial Project ID
- (Federal Funds) notation, if applicable
- Fiscal year and sheet number
- State Road Number
- County Name
- Department's Project Manager's Name
- Begin/end stations & exceptions
- Station Equations (if location map is shown)
- Landscape Architect of Record name and registration number
- Consultants name, address, and contract number, if applicable
- Index of landscape plans

VEGETATION TREE DISPOSITION PLAN

- North Arrow and Scale
- Drainage divides and ground elevations (if available)
- Drainage areas and flow direction arrows
- Street names
- Baseline of Survey or Project Centerline
- Begin & end stations of project, construction and exceptions
- Existing to remain or proposed roadway improvements, structures and drainage facilities with relevant information
- Existing off-site features and conditions that affect or are affected by the project
- Edge of pavement and traffic lanes
- Edge of pavement (edge of traffic lanes)
- Curbs or curb and gutter
- Guardrails
- Right of way and/or limited access fence line and gate locations
- Sidewalks or other planned or existing structures
- Lighting, signs, signal poles and ITS facilities
- Existing and proposed overhead or underground utilities
- Transit facilities
- Details for vegetation removal and pruning
- Vegetation Relocation Plan
- Notes

LANDSCAPE PLANS – PLANTING PLAN SHEETS

- Project centerline
- Edge of pavement (edge of traffic lanes)
- Curbs or curb and gutter
- Drainage systems
- Guardrails
- R/W or limited access fence line
- Sidewalks or other planned or existing structures
- Lighting, signs, and signal poles
- Intersections and driveways which are noted in the plans
- Existing and proposed overhead and underground utility locations
- Clear Zone/Lateral offset (should be plotted or safety setback distances noted frequently on each plan sheet)
- View zones for permitted outdoor advertising signs
- Canopy limits
- Existing vegetation (to remain or be removed)
- Existing off site features and conditions that affect or are affected by the project
- Fence and gate locations
- Setbacks from structural elements or drainage system
- Limits of clear sight
- Transit facilities
- Proposed Planting Plan

LANDSCAPE PLANS - IRRIGATION PLAN SHEETS

(if applicable)

- Type of system
- Location and size of mainlines and lateral lines
- Type and location of spray heads and rotors
- Type and location of valves, sleeves, controllers, water sources/point of connection, backflow preventers, and isolation valves

LANDSCAPE PLANS – DETAILS SHEET

- Applicable landscape details
- Irrigation symbology with associative descriptions (if applicable)

301.3.4 Final Plans Submittal

Ordinarily, the remaining work to be done will be to:

- (1) Comply with comments received as a result of the 90% review,
- (2) Update all plan sheets and the Financial Management (FM) system, and
- (3) Provide Utility Work by Highway Contractor (UWHC) Agreement Plans, consisting of a key sheet, and mainline plan-profile showing proposed utility horizontal and vertical locations.

The Department may provide review comments and mark-ups to the EOR for incorporation into the plan set. The Department may allow the EOR to include sketches of details or revised plan sheets along with their written responses to some review comments, in lieu of resubmitting a component plan set. The EOR will upload these sketches or revised plan sheets into the ERC system. When the review comments have been resolved and documented by the designer, the plans are ready to proceed to completion.

301.3.5 Released For Construction Plans

After corrections noted in the Final Plans submittal have been satisfactorily resolved as determined by the Department, the Department's Project Manager will initial, date and stamp each submittal as "Released for Construction". Only signed and sealed plans stamped "Released for Construction" by the Department's Project Manager are valid.

301.4 Alternative Intersection and Interchange Review

See **FDM 116** for more information on Alternative Intersection and Interchange reviews.

301.4.1 Review Package Requirements: General

The following items are required for an Alternative Intersection and Interchange Review Package:

1. Geometric Layout (PDF and CADD):
 - North Arrow and scale
 - Survey Baseline, equations
 - Significant topographic features including buildings, driveways, bridges, drainage structures, utilities, bicycle and pedestrian facilities, and transit facilities
 - Preliminary horizontal geometry including pavement edges, curb and gutter, traffic separators, islands, sidewalks, and curb ramps
 - Preliminary pavement markings including edge lines, interior lane lines, extension lines, stop bars, cross walks, direction arrows, and gore markings
2. Design Vehicle Turning Movements (PDF and CADD):
 - Design Vehicle swept path diagrams for all through movements, left turn movements, and right turn movements
3. Traffic Forecast (PDF)
 - Opening year and design year AM and PM peak hour volumes for all movements through the intersection
 - Peak hour factor
 - Percentage of heavy vehicles
 - Volume distribution across lanes for multi-lane entries
4. Operational Analysis input and output (PDF)

301.4.2 Review Package Requirements: Roundabouts

The following additional items are required for Roundabout Review Packages:

1. Fastest Path Speed Checks in accordance with NCHRP 672 Section 6.71 (PDF and CADD)
2. Sight Distance Checks in accordance with NCHRP 672 Section 6.7.3 (PDF and CADD)

301.4.3 Review Package Requirements: Diverging Diamond Interchanges

The following additional items are required for Diverging Diamond Interchange Review Packages:

1. Horizontal Alignment Data including baseline locations, curve data, stationing, cardinal points (PC, PT, etc.)
2. Vertical Alignments
3. Cross slopes
4. Conceptual Drainage plan.

302 Key Sheet

302.1 General

The Key Sheet is the first sheet of the contract plans. This sheet describes the project and the contents of the plans. The Key Sheet ~~cell can be found in~~ is created using the FDOT CADD Software.

See **Exhibit 302-1** for an example of a lead Key Sheet with no revisions and **Exhibit 302-2** for a lead Key Sheet with revisions. See **Exhibit 302-3** for an example of a component Key Sheet.

302.2 Financial Project ID, Federal Funds, County Name and State Road Number

The Financial Project ID is the main number identifying each individual project within the Department. Place the number immediately under the heading "CONTRACT PLANS" in the top center of the sheet. When the project involves Federal funds, place the words "(Federal Funds)" under the Financial Project ID. Although federalized, do not put "(Federal Funds)" on state funded projects that are strung to a federal project. Place the county name and roadway section number associated with the Straight Line Diagrams under the Financial Project ID or "(Federal Funds)". Place the roadway section number within parentheses. Place the state road number under the county name and roadway section number. A description of project limits may be placed under the state road number; e.g., "Crim Boulevard to Washington Street".

On projects which have one Contract plans set, but multiple Financial Project IDs, place all of the Financial Project IDs immediately under the heading "CONTRACT PLANS" on the key sheet. On all other plan sheets, show only the lead Financial Project ID in the title block.

302.3 Construction Contract Number, Fiscal Year and Sheet Number

Show the Construction Contract Number in the "Construction Contract No." box (lower right corner) on all component Key Sheets. Show the fiscal year for which the Letting is scheduled in the "Fiscal Year" box; i.e., enter "18" in the box for a project that has a Letting date during the July 2017 to June 2018 fiscal year.

The Key Sheet of each component of the contract plans will be numbered as the first sheet of that component.

302.4 Project Location Map and North Arrow

Place the project location map in the center of the key sheet with a north arrow on the right side of the map. Orient the map so that the north arrow points toward the top of the sheet. If the north arrow cannot be oriented toward the top of the sheet, then orient the map so that the north arrow points to the right.

The map consists of a reproduced portion of one or more county maps showing the project location. County maps ~~in MicroStation (*.dgn) format or~~ in Portable Document Format (PDF) can be downloaded from the **County General Highway Maps** web page.

A utility to download the county map and clip out the project location area is provided in the FDOT CADD Software.

The intent of the project location map is to provide enough information so that the project location is easily understood. Show Section, Township, and Range lines and numbers to provide clarity and scale to the project location map. Show county, city and urban limits where applicable.

Designate roads by name and State Road number or U.S. Highway number. Show the name of the next incorporated city at the edge of the map to which these roads lead. Use standard symbols as shown in the FDOT CADD Software.

Indicate project location using a heavy solid line of substantial width. It is sometimes advantageous to show station numbers at regular intervals, particularly with city street projects. Flag and station the following:

- (1) Begin and end project limits. Provide milepost, correct to three decimals, under the project stations.
- (2) Begin and end limits of bridges and bridge culverts. When an existing structure is being replaced, indicate the proposed structure and not the existing.
- (3) Station equations
- (4) Project exception limits (i.e., mileposts excluded from project)
- (5) Rail crossings within the limits of construction, including name of railroad, DOT/AAR crossing number, and railroad milepost.

Calculate the end milepost by adding the distance in miles between begin and end project to the begin milepost. Plans are to be prepared using stationing in linear feet. A project

may be prepared using mileposts when linear foot stationing is unavailable. Station information is to be consistent with the station information entered into the Work Program Administration (WPA) system during final design. See **FDM 111.2.1** for information on updating the WPA system.

When several projects are covered by the same set of plans, flag and station begin and end project limits for each Financial Project ID.

The project location map is typically located on the lead component Key Sheet.

Show a small-scale state map at the upper right portion of the lead component Key Sheet and indicate the location of the project thereon. The map may be shown on other component Key Sheets, but is not required.

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. Sheet number prefixing is not required for the lead component plan; i.e., "IT-#" is not required for ITS Plans when they are the lead component.

See the **Structures Manual, Volume 2 – [Structures Detailing Manual](#)** when Structures plans become the lead component.

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
- (29) Signing and Pavement Marking Plans⁽²⁾
- (30) Signalization Plans⁽²⁾
- (31) ITS Plans⁽²⁾
- (32) Lighting Plans⁽²⁾
- (33) Landscape Plans⁽²⁾
- (34) Mitigation Plans
- (35) Miscellaneous Structures Plans
- (36) Toll Facilities⁽²⁾

⁽¹⁾ Place at the end of the numbered roadway plan sheets.

⁽²⁾ When the work for these components is minor, sheets may be included (and numbered sequentially) in the lead component; do not show these as component plans.

Note: Do not place Box Culvert plan sheets in the Roadway component plans. These sheets are to be placed in a Structure component, even when there are no bridge plans.

302.6.1 Early Works

The roadway plans may require insertion of sheets that were prepared early, or prior to the design process. These sheets may be identified and numbered with the following prefixes:

- (1) GR-# Soil Survey and Report of Core Borings normally associated with the roadway plans set (including miscellaneous structures but excluding bridges and walls)
- (2) TR-# Tree Survey
- (3) UTV-# Verified Utility Locate

These sheets appear as the last item in the index of roadway plan sheets. Include an asterisk next to the early works title and a note below the index per **Exhibit 302-1**.

No plans sheets other than those listed above are to be separated from the component plans.

302.7 Professional Responsibility

An Engineer of Record (EOR) is the lead Florida licensed professional engineer in charge of the preparation of the component plans. Place in the lower right corner the name and license number of the EOR. Also show the name, ~~and~~ address, and phone number of the engineering business or agency where the EOR is employed. Include the consultant contract number and vendor number when plans are prepared by an engineering business.

For non-engineering professionals that are in charge of the preparation of the component plans, change title to “Licensed Professional of Record”. Include similar information that applies to their profession.

Place the name of the Department’s Project Manager below the EOR information. Show only the Department’s Project Manager at this location, except for:

- (1) When plans are prepared by Department Personnel, the name of the Department’s designer may be placed immediately below the name of the Department’s Project Manager.
- (2) When appropriate, the name of the GEC Project Manager may be placed immediately below the Department’s Project Manager.

302.8 Governing Standard Plans and Standard Specifications

Show the governing [Standard Plans](#) and [Standard Specifications](#) on the lead component Key Sheet as shown on **Exhibit 302-1**. Do not show this reference on other component Key Sheets. For requirements of the Structures General Notes and inclusion of the relevant bridge related [Standard Plans](#) in the structures component plan set, see the [Structures Detailing Manual](#). For additional information on the [Standard Plans](#) and [Standard Specifications](#), see **FDM 115**.

When [Standard Plans Interim Revisions \(IRs\)](#) are released, the engineer must determine if any **IRs** apply to the project and reference those applicable **IRs** as shown on **Exhibit 302-1**.

302.9 Developmental Standard Plans

Insert **Developmental [Standard Plans](#)** at the end of each applicable component plan set as applicable. When included in structure component plans, insert **Developmental [Standard Plans](#)** before existing bridge plans. List **Developmental [Standard Plans](#)** below the “Index of Sheets” for the plans component in which they are included, as shown on **Exhibit 302-1**.

302.10 Revisions

The process and requirements for completing plan revisions are provided in **FDM 132**.

Show a complete record of all contract plans revisions on the lead component Key Sheet under the “REVISIONS” header located below the project location map. Include the component (such as roadway, structures, signing and pavement marking), the sheet number, and the date for each plan sheet that was revised. Show the unique numbered symbol that corresponds to the Revision Number on the Revision Memo and modified sheets as well.

Show revisions to the Key Sheet in the Key Sheet Revisions block placed below the project location map, and to the right of the “REVISIONS” header. List the revision date and a brief description of the revision. The Key Sheet Revisions block is only used to record changes to the Key Sheet other than recorded revisions under the “REVISIONS” header. A new lead component Key Sheet is required when any sheet within the contract plans is revised.

If a sheet is being deleted, note this under the “REVISIONS” header, and revise the Index of Sheets to show “(DELETED)” next to the deleted sheet. Record the change to the Index of Sheets in the Key Sheet Revisions block.

Revisions made after award (i.e., Post-Let Revisions) are to be “clouded” in a conspicuous manner. If there are no revisions to the plans, neither the “REVISIONS” header nor the Key Sheet Revisions block are required.

302.11 Strung Projects

Contract plans that are independently prepared but are let in the same construction contract are referred to as strung projects. When a federally-funded project is strung with a non-federal eligible (NFE) project, the federally-funded project is typically the lead project. When a federally funded project is strung with a state funded project, the entire contract becomes federalized; i.e., both the state funded project and the federally funded project must comply with all applicable federal laws, rules, and regulations related to the federalized contract. For each set of contract plans that are to be strung, including project numbers without contract plans, place the strung project note on the lead component Key Sheet as shown in *Exhibit 302-1*. Show the strung project note only on lead component Key Sheets. Include P projects without contract plans are included for informational purposes.

List revisions to any strung project on the lead component Key Sheet of the lead project under the “REVISIONS” header, under the respective Financial Project ID.

Exhibit 302-1: Original Key Sheet

Exhibit 302-2: Revision Key Sheet

Exhibit 302-3: Component Key Sheet

304 Summary of Pay Items

Modification for Non-Conventional Projects:
Delete FDM 304 .

304.1 General

The Summary of Pay Item sheets are no longer produced for contract plans [\(See **FMD FDM 902**\)](#). ~~See **FDM 902** for guidance on the Estimated Quantities Report and Summary of Pay Items Report.~~

305 Drainage Map and Bridge Hydraulic Recommendation Sheet

305.1 Drainage Map

Drainage maps are required for all projects that add mainline capacity or changes to the drainage hydraulics. Maps may be developed using a photographic (aerial or other) base map and included in the construction plans.

Preformatted drainage map sheet cells are located in the FDOT CADD Software. The upper (grid) portion of each sheet is used for plotting the project profile. The standard grid pattern for the profile portion of the sheet is five lines per inch, both in the horizontal and vertical. This will accommodate most scales. An optional grid with four lines per inch is available. This optional grid may be used if appropriate for scale.

Locate the topography of the project area in the remaining portion of the sheet. Utilize a horizontal and vertical scale of the profile so that the stations and elevations can be read directly from the grid without the use of a scale. Use the same horizontal scale for both the plan and profile views. Recommended scales for facility types are as follows:

<u>Location</u>	<u>Horizontal Scale</u>	<u>Vertical Scale</u>
Inside Urban Boundary	1" = 200'/500'	1" = 5'/1"=10'
Outside Urban Boundary	1"=1000'/2000'	1" = 10'/1"=20'

305.1.1 Plan View

The plan view must comply with the following requirements:

- (1) Show stationing every 500 feet for scales of 1" = 100'/200', every 1000 feet for a scale of 1" = 500' and every 5000 feet for scales of 1" = 1000'/2000'. For additional information, see **FDM 311**.
Show horizontal alignment station equations and exceptions. Also show begin and end stations of project, construction, bridge, and bridge culverts.
- (2) Clearly label existing physical land features affecting drainage, such as lakes, streams, and swamps, by name and direction of flow. Show past high-water elevations with date of occurrence, if available, and present water elevations with date of reading.

Where applicable, show drainage divides and other information (such as pop-off elevations and spot elevations) to indicate the overland flow of water. Show drainage areas on maps in acres.

Use inserts to show areas that are of such magnitude that the boundaries cannot be plotted at the selected scale.

- (3) Label existing road numbers and street names, drainage structures with type, size, flow line elevations, flow arrows and any other pertinent data. Refer to the FDOT CADD Software for correct symbols for existing drainage facilities. In a situation of limited space, all data relating to existing drainage structures and pipes may be compiled in a table format and shown in either the plan or profile portion of the sheet. Should the space limitations be such that a table will not fit within the plan or profile view, a supplemental drainage data sheet is acceptable.
- (4) Show proposed drainage structures, cross drains, storm drain pipes, outfall structures and retention/detention pond locations. Label cross drains by pipe size and structure number. Label structures by structure number, storm drain pipes by pipe size, and ponds by pond number and area size. Show arrows to indicate direction of flow along proposed ditches.
- (5) Label Section, Township, Range, and county lines for rural and urban projects when occurring within the project limits.
- (6) Include a north arrow and scale, typically in the upper right corner of the plan view.
- (7) If the drainage map is to be included in the contract plans set, include the following note:

DO NOT USE THE INFORMATION ON THIS SHEET FOR CONSTRUCTION PURPOSES. THIS SHEET IS IN THE PLANS FOR DOCUMENTATION AND TO ASSIST CONSTRUCTION PERSONNEL WITH DRAINAGE CONCERNS.

305.1.2 Profile View

The profile view, if shown, must comply with the following requirements:

- (1) The recommended vertical scale for rural and urban projects is 1" = 5' in level terrain and 1" = 10' in rolling terrain. A scale of 1" = 20' may sometimes be used for rural projects through rough terrain to avoid numerous profile breaks. The profile can be broken for rolling terrain in urban areas; however, a scale of 1" = 20' should never be used at locations of proposed storm drain systems.
- (2) Station numbers are to be shown along the bottom edge of the profile view.

- (3) Show elevation datum at each side of the sheet. In cases where the profile block is insufficient and excess space is available on the plan portion of the sheet, the profile block may be expanded.
- (4) Plot and label the profile of the existing natural ground, and note the existing elevation at each end, just above the station numbers.
- (5) Plot the proposed profile grade line. Percent of grade need not be shown. Plot the PC, PI, and PT of vertical curves using their respective standard symbols; however, no data (station, elevation, length of curve) needs be noted. Label begin and end project, construction, bridge and bridge culvert stations, station equations, and exceptions. Show profile grade line elevations at begin and end project stations and at the beginning and end of each additional drainage sheet.
- (6) Plot proposed cross drains and identify by structure number. Do not show skew or pipe slope in plotting, but plot to elevation and location at point of crossing the construction centerline.
- (7) For projects with storm drain systems, show only the mainline structure and pipes. Laterals need not be shown. Label each structure with its appropriate structure number, and flow line elevations noted for the incoming and outgoing pipes.
- (8) Show high water elevations affecting base clearance or roadway grades.

305.1.3 Flood Data Summary Box

The Project Drainage Engineer must provide the information required to complete the Flood Data Summary box.

Place the Flood Data Summary box on the drainage map, either in the plan or in the profile portion. Place the Flood Data Summary box on the General Notes sheet when the drainage map is not included in the plans.

Design, base and overtopping or greatest flood discharge and stage values are required for all cross structures (culverts and bridges), regardless of size, under the following conditions:

- (1) New cross structures
- (2) Existing cross structures that are being modified, where modifications affect the existing hydraulic calculations.
- (3) Existing cross structures that have a history of flooding or other hydraulic problems, even if the structure is not to be modified; or

- (4) Existing cross structures that are not being modified but are being impacted by a modification to another cross structure within the same drainage basin.

Place the following under the Summary of Flood Data table to avoid misuse and possible responsibility for changes in the flood information values over which the Department has no control:

Note: This hydraulic data is a summary of design calculations and is provided for informational purposes only. The user is cautioned against the assumption of precision for the discharge rates and water surface elevations. The units are in cubic feet per second (cfs) and the design stages are in feet, **[Insert datum reference here]**.

Definitions:

Design Flood: Utilized to assure a standard level of hydraulic performance.

Base Flood: Has a 1% chance of being exceeded in any year (100 yr. frequency).

Overtopping Flood: Causes flow over the highway, over a watershed divide or through emergency relief structures.

Greatest Flood: The most severe that can be predicted where overtopping is not practicable.

A preformatted summary box with disclaimer and definitions is located in the FDOT CADD Software.

305.1.4 Interchange Drainage Map

If projects include interchanges or rest areas, include a drainage map on a 1" = 200' or 1" = 500' scale. The purpose of this detail is to show the small areas needed to calculate pipe sizes for the tabulation of drainage structures within these special areas. Should major drains pass through one of these areas, include a cross reference note indicating the proper sheet which reflects the drainage area for that through-structure.

305.2 Bridge Hydraulic Recommendation Sheet

When a Bridge Hydraulic Recommendation Sheet (BHRS) is required (see [Drainage Design Guide, Section 5.7.4](#)), it must be prepared on a preformatted sheet. The cell for this sheet is located in the FDOT CADD Software. Place the BHRS in the structures plans.

Parallel (dual) bridges may be shown on one sheet; however, it typically requires a second sheet to clearly convey the fit of the bridge to the stream bank. When two sheets are used, only the plan and profile information is required on the second sheet.

The preformatted BHRS is divided into the four regions listed below. The required information for each region is described in the following sections.

- (1) Plan View
- (2) Profile View
- (3) Location Map and Drainage Area
- (4) Existing Structures, Hydraulic Design Data and Hydraulic Recommendations

A completed BHRS is shown as **Exhibit 305-1**.

305.2.1 Plan View

The plan view is to include the following:

- (1) Stationing, scale, and north arrow. Include the channel baseline if one was created.
- (2) Existing topography including existing bridge(s) and contours to show elevations. Show sufficient detail in the vicinity of the proposed bridge to depict how the structure will tie to natural ground.
- (3) Label the name of the water body (e.g., St. Johns River).
- (4) Arrows showing the direction of the flow.
- (5) Proposed bridge begin and end station.
- (6) Limits of riprap.
- (7) R/W lines

305.2.2 Profile View

The profile view is to include the following:

- (1) Stationing and scale.
- (2) One cross section which most represents the section at the proposed crossing.
- (3) Road profile for the proposed structure (i.e., stationing and elevation).
- (4) Proposed bridge with begin and end station, low member, and pier locations.
- (5) Abutment locations (e.g., toe of slope) and abutment protection.
- (6) Flood elevations. For non-tidal crossings, show the Normal High Water (NHW) and Design Flood elevations. For tidal crossings, show the Mean High Water (MHW) and Design Flood Stage elevations.
- (7) Present water elevation with month, day and year of survey.
- (8) Bridge Number (for the proposed structure).

305.2.3 Location Map and Drainage Area

Provide a location map similar to that used on the key sheet. Include an arrow showing the project location, north arrow and Range and Township.

Use an appropriate scale for the map so that the entire drainage area for the proposed structure is shown. (For projects with very large drainage areas, use a scale for the map that clearly shows the project location rather than a scale that shows the entire drainage area).

Show the drainage area boundaries using a very heavy, broken line, with the area (in acres or square miles) shown within the boundary. The proposed structure location should be shown. Existing structures over the same water body and those structures that affect the hydraulics of the proposed structure should be located and numbered and corresponding existing structure information listed in the appropriate columns.

305.2.4 Existing Structures Data, Hydraulic Design Data, and Hydraulic Recommendations

The [Drainage Design Guide](#), *Chapter 5* provides additional guidance for this section.

The following information is required for this section:

Existing Structures: Column contains information pertaining to the existing structures. Structure 1 refers to the structure being replaced or modified. Structures 2, 3 & 4 refer to relief structures, immediate upstream and downstream structures and those structures that affect the hydraulics of the proposed structure.

Proposed Structure: Column contains information pertaining to the proposed structure.

Foundation: Provide information describing the type of foundation (e.g., timber piles, concrete piles).

Overall Length (ft): Provide the total length of the structure in feet. The length is measured from the top of the abutments. Use the total length shown in the final plans for the proposed structure.

Span Length (ft): Provide the span length of the structure in feet (i.e. the length of the main span).

Type Construction: Describe the material(s) used for construction of the structure (e.g., steel, concrete, steel and concrete).

Area of Opening (ft²) @ D.F.: Provide the area of opening in square feet below the design flood elevation at the bridge section. Subtract the assumed pile area if pile area is significant.

Bridge Width (ft): Provide the distance from outside rail to outside rail in feet.

Elev. Low Member (ft): Provide the elevation in feet of the lowest point along the low member of the structure.

Water Surface Elevations (ft): Provide elevation in feet of the following water surfaces at the bridge section, when applicable:

- Normal High Water (N.H.W): This applies only to non-tidal areas.
- Control: Water surface elevation controlled by the operation of pump stations, dams or other hydraulic structures. This applies only to non-tidal areas.
- Mean High Water (M.H.W.): This applies only to tidal areas.

- Mean Low Water (M.L.W.): This applies only to tidal areas.

Max. Event of Record: Column contains information related to the maximum event recorded based on historical information, when available.

Design Flood: Column contains information related to the design flood.

Base Flood: Column contains information related to the base flood.

Overtopping Flood/Greatest Flood: Column contains information related to the overtopping or greatest flood event. If the overtopping flood has a lower return period than the greatest flood, then the block indicating overtopping flood is checked and the information related to the overtopping flood is shown. Otherwise, the block indicating greatest flood is checked and the information related to the greatest flood is shown.

Stage Elevation (ft): Provide stage elevation in feet (NAVD 88 or NGVD 29) for the Maximum Event of Record, Design Flood, Base Flood and Overtopping or Greatest Flood. Use data from hydraulic model for freshwater flow. Use maximum elevation during the flood or ebb storm surge tidal flow.

Discharge (cfs): Provide total discharge in cubic feet per second. Use data from hydraulic model for freshwater flow. Use maximum discharge during the flood or ebb storm surge tidal flow.

Average Velocity (fps): Provide average velocity in feet per second. Use data from hydraulic model for freshwater flow. Use maximum velocity during the flood or ebb storm surge tidal flow.

Exceedance Prob. (%): Provide the probability that the conditions will be exceeded. Probability is determined as 100% times unity over the return interval (e.g., $100\% \cdot (1/100) = 1\%$).

Frequency (yr): Provide the return period of the conditions in years of the worst-case scour condition up through the design return period flow conditions.

Pier Information: Provide the following pier information for the proposed structure:

- Pier Numbers: Pier number(s) which correspond to the pier size and type and the scour elevations.
- Pier Size and Type: Pier size and type which produces the greatest scour. If necessary, for clarity, place a reference to the appropriate details of the bridge plans. If the space provided is not adequate, place the information in the plan or profile view.

Scour Elevations (ft): Provide the following scour information for the proposed structure:

- **Long-Term Scour:** Applicable only to structures required to meet extreme event vessel collision load. Place “N/A” when not applicable.
- **Total Scour Elevation (< 100-year):** The predicted total scour elevation in feet for the worst-case scour condition up through the scour design flood frequency. This includes aggradation or degradation, channel migration, local scour (pier and abutment) and contraction scour.
- **Total Scour Elevation (< 500-year):** The predicted total scour elevation in feet for the worst-case scour condition up through the scour design check flood frequency. This includes aggradation or degradation, channel migration, local scour (pier and abutment) and contraction scour.

Begin Bridge Station: Provide the station for the beginning of the bridge.

End Bridge Station: Provide the station for the end of the bridge.

Skew Angle (degrees): Provide the angle in degrees at which the centerline of the structure is skewed from the centerline of construction.

Clearance Provided (ft): Provide the following navigational and drift clearance information for the proposed structure:

- **Navigation Horizontal:** The horizontal distance provided between fenders or piers.
- **Navigation Vertical:** The vertical distance between low beam member and design flood water elevation.
- **Navigation Above Elevation:** The Design flood water elevation in feet (NAVD 88 or NGVD 29) used to determine Navigation Vertical clearance. Use normal high water (NHW) elevation or control elevation for freshwater flow. Use mean high water (MHW) for tidal flow.
- **Drift Horizontal:** The actual minimum horizontal clearance provided.
- **Drift Vertical:** The actual minimum vertical clearance in feet provided above the design flood water elevation.
- **Drift Above Elevation:** The Design flood water elevation in feet (NAVD 88 or NGVD 29) used to determine Drift Vertical clearance. Use normal high water (NHW) elevation or control elevation for freshwater flow. In many cases, it is reasonable to use the elevation at the Approach Section, realizing that this will be slightly higher than actual elevation at the bridge. For tidal flow, use the maximum stage associated with an average velocity of 3.3 feet per second through the bridge section during the flood or ebb for the storm surge for the design flood. If the maximum velocity due to the storm surge is less than 3.3 fps, use the stage associated with the maximum velocity through the bridge section.

If either of these stages causes the profile to be higher than the profile of the bridge approaches, consider other alternatives such as:

- Discuss with personnel in the Structures Design Office, the potential of having less drift clearance and designing the structure for debris loads.
- Do a more rigorous and site-specific analysis to set the stage above which to provide the standard drift clearance. Investigate and address these situations on a site-specific basis.

Minimum Clearance (ft): Provide the following minimum navigational and drift clearances in feet. Vertical and horizontal clearances will also be subject to the requirements of the Coast Guard, Corps of Engineers, Water Management District, and any other regulatory agency having appropriate statutory jurisdiction or authority. Such regulatory agency requirements may exceed Department requirements.

- Navigation Horizontal: Crossings subject to small boat traffic, must provide a minimum 10-foot horizontal navigation clearance. Other agencies may have minimum clearance requirements.
- Navigation Vertical: See *FDM 260.8.1* for information on vertical clearances over water.
- Drift Horizontal and Vertical: Consistent with debris conveyance needs and structure economy where no boat traffic is anticipated.

Rubble Grade: Provide the type of rubble to be constructed at the begin and end bridge abutments; e.g., Riprap (Bank & Shore). References can be made to details sheets if non-standard riprap is employed.

Slope: Provide the slope of the abutments at the begin and end bridge; e.g., 1H:2V.

Non-buried or Buried Horizontal Toe: Indicate whether the toe of the abutment will be non-buried or buried when extended horizontally from the bridge. The horizontal and vertical extents should be determined using the design guidelines contained in HEC-23.

Toe Horizontal Distance (ft): Provide the horizontal extent in feet of the rubble protection measured from the toe of the abutment. The horizontal and vertical extents should be determined using the design guidelines contained in HEC-23.

Limit of Protection (ft): Provide the limits of protection, measured parallel to the stationing, from the edge of the rubble protection to the bridge begin/end station. If the distance is different on each side, indicate both distances with their corresponding sides.

Deck Drainage: Describe how the rainfall runoff is collected and conveyed from the proposed structure deck; e.g., scuppers, storm drain system.

Remarks: Provide any pertinent remarks.

- Wave Crest Elevation (ft) (when applicable): Provide the 100-year design wave crest elevation including the storm surge elevation and wind setup. The vertical clearance of the superstructure must be a minimum of 1-foot above the wave crest elevation.

Exhibit 305-1: Bridge Hydraulic Recommendation Sheet

306 Typical Sections

306.1 General

Typical Section sheets provide detailed cross section depictions of the principal roadway elements that are standard between certain station or milepost limits. These sections are the basis for construction details and information shown on the plan sheets.

306.2 Typical Section Sheet

Typical sections should only show typical conditions that are found within the limits applicable to that section. Non-standard conditions that prevail for short distances should not be shown. Typical sections are to show existing elements that are to be incorporated into the final roadway section, along with the proposed elements.

Show the station limits or milepost of each section below the typical section title. Typical section stationing must cover the entire project. Include transitions from one typical to another in the stationing of one or the other typical section. Sheets that feature more than one typical section should read from the top down, with the sections in the order in which they occur within the project.

Place Typical Section sheets in the plans in the following order:

- (1) Project mainline
- (2) Ramps and service roads (for projects which include an interchange)
- (3) Crossing side roads
- (4) Minor side streets

The FDOT CADD Software contains a number of typical sections that can be used and adjusted to suit the conditions of a particular project. Usually, typical sections are not created to scale, but the horizontal dimensions should be proportionate.

For illustrations of various typical sections, see *Exhibits 306-1* through *306-11*.

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.

306.3 Typical Section Information

Include the following information on the typical sections:

- (1) Cross Slopes
 - (a) Express cross slopes of roadway pavement, shoulder surfaces, sidewalks and bridge decks as a decimal part of a foot vertical per foot horizontal. These cross slopes should be rounded to two decimal places, i.e., 0.02, 0.06. Three decimal places may be used when required.
 - (b) Show median and outer slopes by ratio, vertical to horizontal, i.e., 1:4, 1:2.
 - (c) Include either feathering details or notes (or both) when resurfacing without milling in urban curb and gutter sections is specified or when milling depth is less than the overlay thickness.
 - (d) When cross slope correction is necessary, include special milling and layering details showing the method of correction in the plans.
- (2) Location of profile grade point.
- (3) Depict pavement construction in a clear, precise manner by indicating the LBR requirement and the thickness of the subgrade stabilization, subbase or base, as well as thickness for structural course, friction course and shoulder pavement. Use 4 inches for both base extension on rural sections and for stabilization extension on curbed sections.
- (4) Limits of grassing.
- (5) Sidewalk location and width.
- (6) Curb and gutter location and type (show Type E or F, not the dimension).

- (a) On new construction curb and gutter projects which include Asphalt Base, Type B-12.5 only, indicate the asphalt curb pad on the typical section and provide a detail.
- (7) Limits of standard clearing and grubbing unless selective clearing and grubbing is present.
- (8) R/W line and limits of construction.
- (9) Pavement dimensions.
- (10) For widening projects, provide a dimension for total pavement width (existing and proposed). Show the pavement widening width with an asterisk. Show Note 3, of **FDM 306.5**, as near to this noted asterisk as possible.
- (11) Shoulder dimensions; paved and total width
- (12) Label shoulder treatment on RRR projects (See **FDM 210.4.4**)

306.4 Required Data

Include the following data for each typical section:

- (1) Traffic data (as identified in **FDM 120.2.2**) consistent with the data used for pavement design.
 - (a) Current Year and AADT
 - (b) Estimated Opening Year and AADT
 - (c) Estimated Design Year and AADT
 - (d) K, D, T (24 hour) and T (Design Hour) factors.
 - (e) Design Speed: The estimated opening and design year traffic data is not required for skid hazard projects.
 - ~~(e)~~ (f) Context Classification
- (2) Approved pavement designs described in the order of construction:
 - (a) For new construction start with Option Base Group and end with friction course.
 - (b) For resurfacing projects start with milling depth, then list the structural courses and end with friction course.
- (3) Standard notes. Refer to **FDM 306.5** for standard notes for typical sections.
- (4) Template dimensions:

For widening projects, show the existing pavement width as a \pm dimension, and show the base widening width with an asterisk. Show Note 3, of **FDM 306.5**, as near to this noted asterisk as possible.

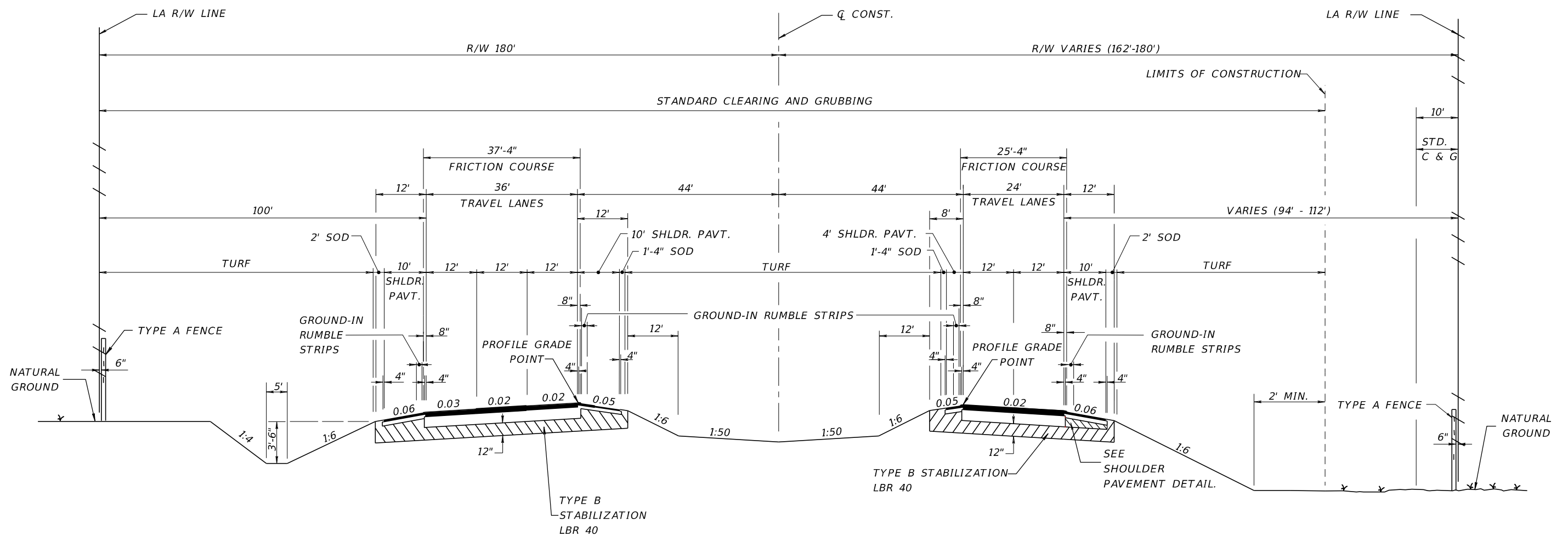
NOTE: For typical sections with varying dimensions, clearly indicate the dimensions on the plan-profile sheets.

- (5) Identify shoulder treatment where applicable on RRR projects (See **FDM 210.4.4**)

306.5 Standard Notes for Typical Section Sheets

Show the following standard notes on typical section sheets as applicable:

- (1) For details and limits of selective clearing and grubbing see _____.
- (2) (Under paved shoulders):
This area may be constructed of base material at no additional compensation.
- (3) (On widening projects):
Actual width of base widening may vary due to actual existing pavement width. A uniform width base widening strip may be constructed at no additional compensation.



**TYPICAL SECTION
I-10 (SR 8)
STA. 567+25.67 TO STA. 1056+84.35**

TRAFFIC DATA

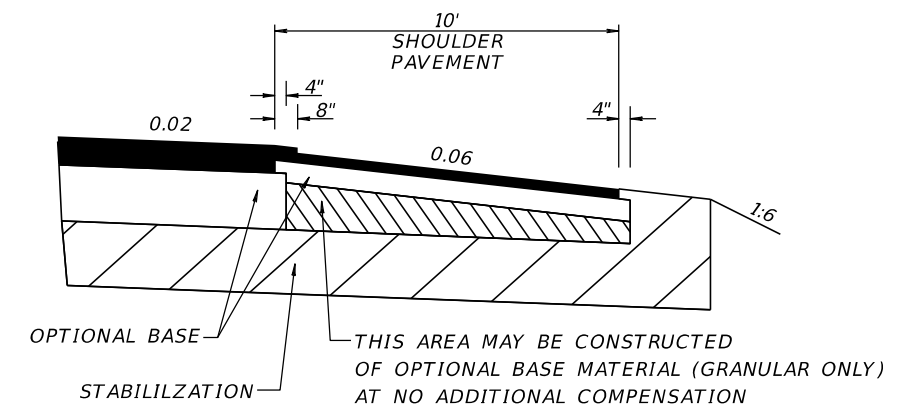
CURRENT YEAR = 2018 AADT = 22300
 ESTIMATED OPENING YEAR = 2020 AADT = 23300
 ESTIMATED DESIGN YEAR = 2040 AADT = 51500
 K = 9 % D = 56 % T = 10 % (24 HOUR)
 DESIGN HOUR T = 5 %
 DESIGN SPEED = 70 MPH
 CONTEXT CLASSIFICATION = N/A

TRAVEL LANES

OPTIONAL BASE GROUP 9 ~~WITH~~
 TYPE SP STRUCTURAL COURSE (TRAFFIC ~~D~~ E) (2 1/2")
 TYPE SP STRUCTURAL COURSE (TRAFFIC ~~D~~ E) (1 1/2") (PG 76-22)
 FRICTION COURSE FC-5 (3/4") (PG 76-22)

SHOULDER PAVEMENT

OPTIONAL BASE GROUP 1 ~~WITH~~
 TYPE SP STRUCTURAL COURSE (TRAFFIC ~~D~~ E) (1 1/2") (PG 76-22)

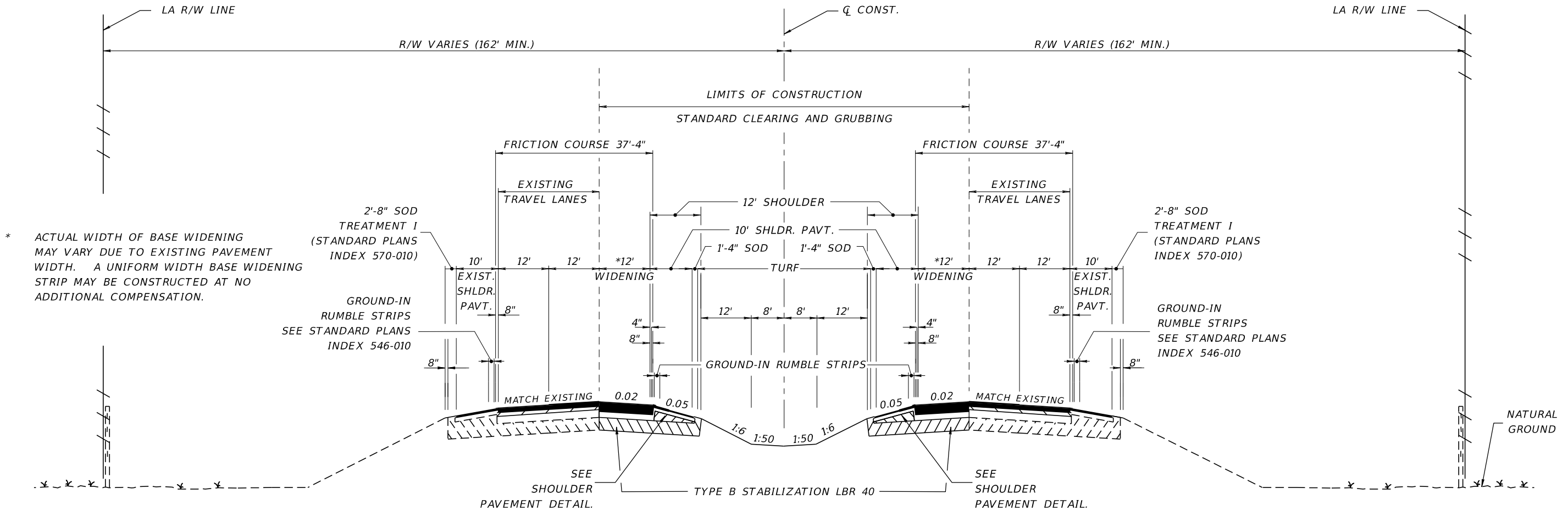


SHOULDER PAVEMENT DETAIL

**Exhibit 306-1
Limited Access Facility
Date: 1/1/20**

REVISIONS				LUKE S. WALKER, P.E. P.E. NO.: 99991 ROADWAY ENGINEERS, INC. 123 MAIN STREET TALLAHASSEE, FL 32301	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					SR 8	BAY	123456-1-52-01	

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



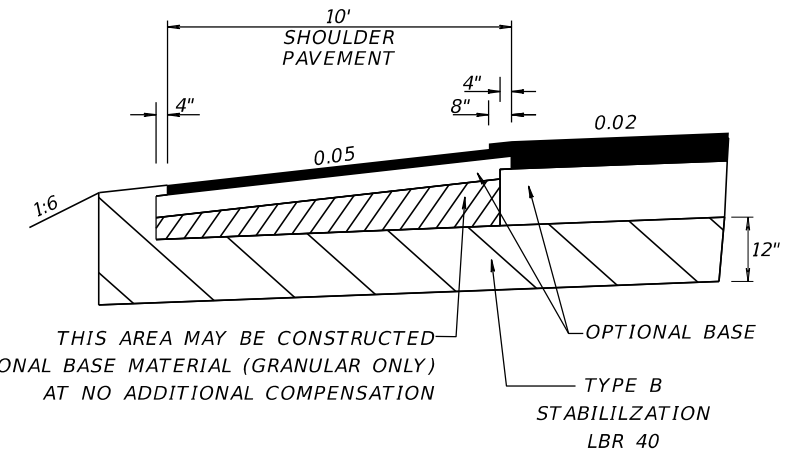
* ACTUAL WIDTH OF BASE WIDENING MAY VARY DUE TO EXISTING PAVEMENT WIDTH. A UNIFORM WIDTH BASE WIDENING STRIP MAY BE CONSTRUCTED AT NO ADDITIONAL COMPENSATION.

TRAFFIC DATA

CURRENT YEAR = 2018 AADT = 22300
 ESTIMATED OPENING YEAR = 2020 AADT = 23300
 ESTIMATED DESIGN YEAR = 2040 AADT = 51500
 K = 9 % D = 56 % T = 10 % (24 HOUR)
 DESIGN HOUR T = 5 %
 DESIGN SPEED = 70 MPH
 CONTEXT CLASSIFICATION = N/A

**TYPICAL SECTION
 I-75 (SR 93)
 STA. 1342+25.00 TO STA. 1950+85.75**

- WIDENING**
- OPTIONAL BASE GROUP 9 ~~WITH~~
 - TYPE SP STRUCTURAL COURSE (TRAFFIC ~~D~~ E) (2 1/2")
 - TYPE SP STRUCTURAL COURSE (TRAFFIC ~~D~~ E) (1 1/2") (PG 76-22)
 - FRICTION COURSE FC-5 (3/4") (PG 76-22)
-
- MILL EXISTING ASPHALT PAVEMENT (2 1/4" DEPTH)
 TYPE SP STRUCTURAL COURSE (TRAFFIC ~~D~~ E) (1 1/2") (PG 76-22)
 FRICTION COURSE FC-5 (3/4") (PG 76-22)
-
- EXISTING OUTSIDE SHOULDER PAVEMENT
- MILL EXISTING ASPHALT PAVEMENT (1 1/2" DEPTH)
 TYPE SP STRUCTURAL COURSE (TRAFFIC ~~D~~ E) (1 1/2") (PG 76-22)
-
- NEW INSIDE SHOULDER PAVEMENT
- OPTIONAL BASE GROUP 1 ~~WITH~~
 TYPE SP STRUCTURAL COURSE (TRAFFIC ~~D~~ E) (1 1/2") (PG 76-22)

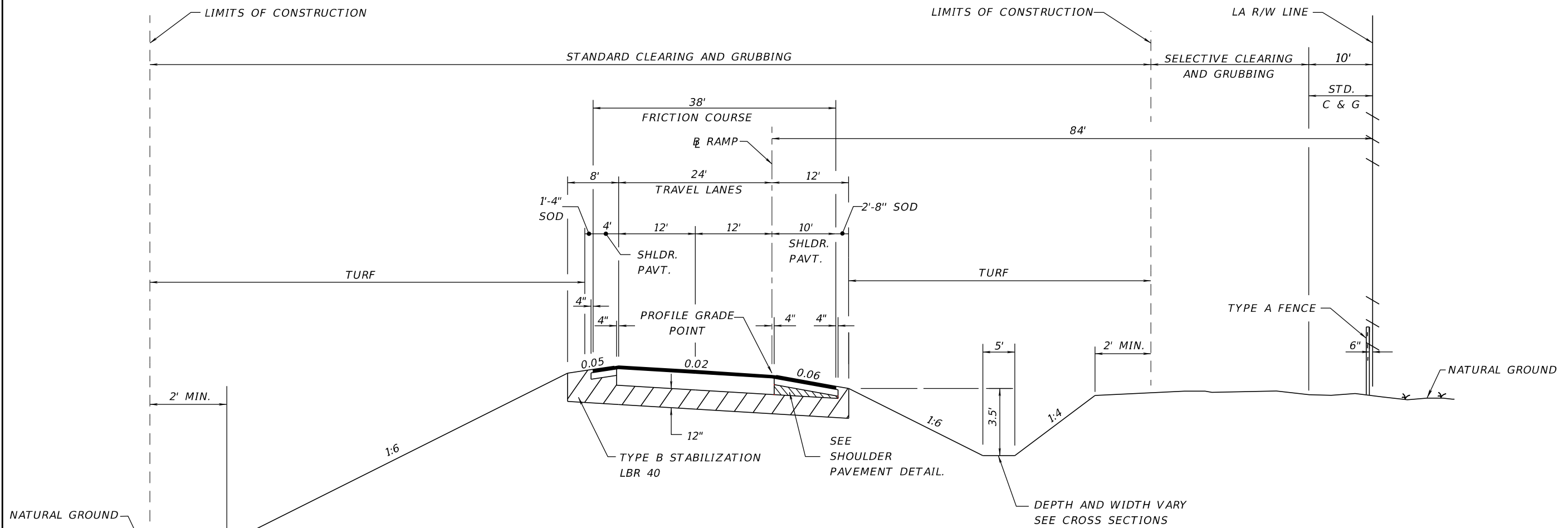


INSIDE SHOULDER PAVEMENT DETAIL

Exhibit 306-2
 6-Lane Limited Access Facility
 Date: 1/1/20

REVISIONS				LUKE S. WALKER, P.E. P.E. NO.: 99991 ROADWAY ENGINEERS, INC. 123 MAIN STREET TALLAHASSEE, FL 32301	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					SR 93	BAY	123456-1-52-01	

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**TYPICAL SECTION
RAMP "C"
STA. 623+28.64 TO STA. 629+13.78**

TRAFFIC DATA

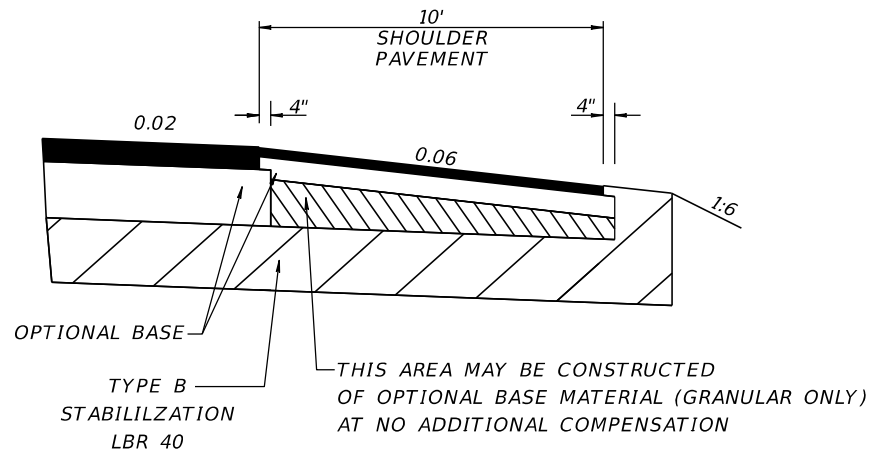
CURRENT YEAR = 2018 AADT = 8,000
 ESTIMATED OPENING YEAR = 2020 AADT = 8,800
 ESTIMATED DESIGN YEAR = 2040 AADT = 12,000
 K = 10% D = 100% T = 8% (24 HOUR)
 DESIGN SPEED = 30 MPH
 CONTEXT CLASSIFICATION = N/A

TRAVEL LANES

OPTIONAL BASE GROUP 9 ~~WITH~~
 TYPE SP STRUCTURAL COURSE (TRAFFIC B) (1 1/2") ~~AND~~
 FRICTION COURSE FC-12.5 (TRAFFIC B) (1 1/2") (PG 76-22)

SHOULDER PAVEMENT

OPTIONAL BASE GROUP 1 ~~WITH~~
 FRICTION COURSE FC-12.5 (TRAFFIC B) (1 1/2") (PG 76-22)

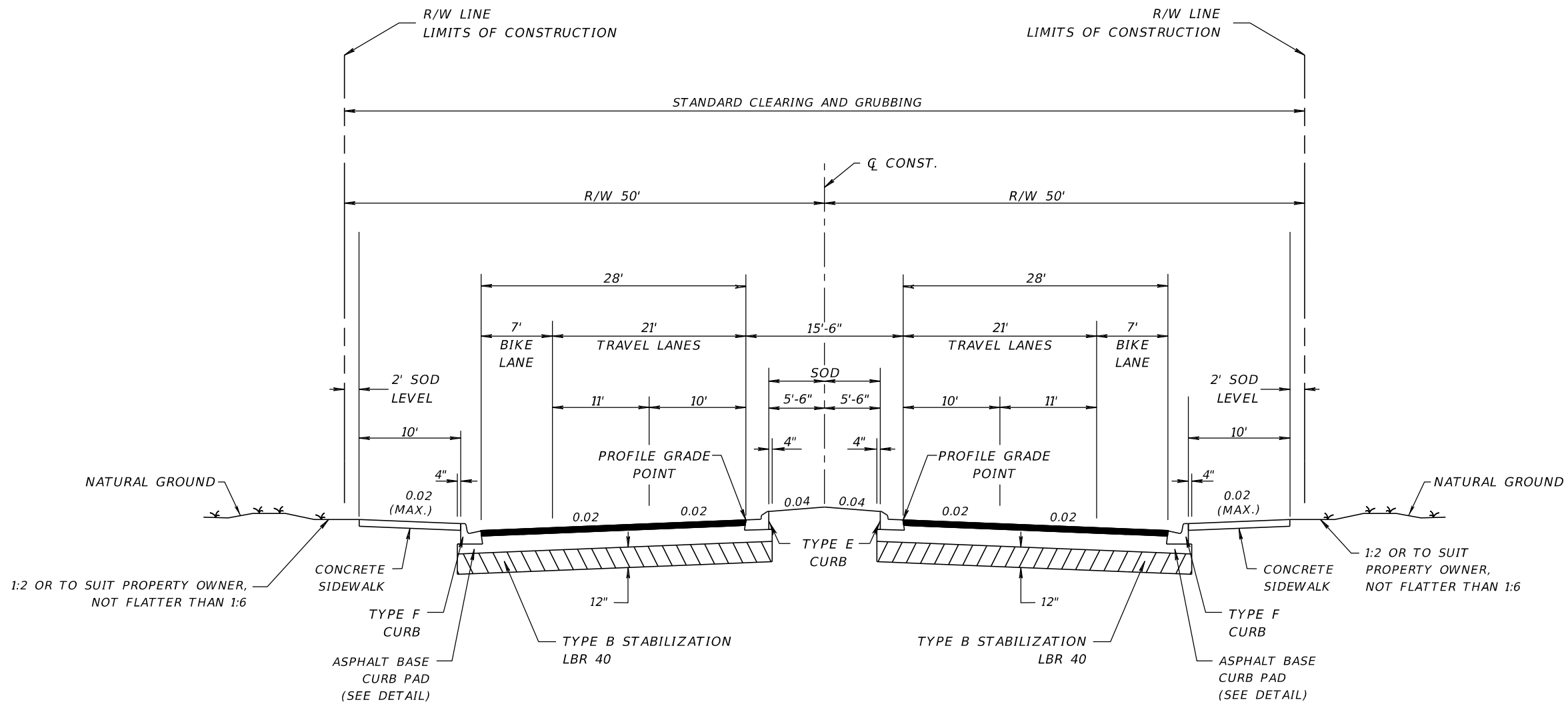


SHOULDER PAVEMENT DETAIL

Exhibit 306-3
Ramp
Date: 1/1/20

REVISIONS				LUKE S. WALKER, P.E. P.E. NO.: 99991 ROADWAY ENGINEERS, INC. 123 MAIN STREET TALLAHASSEE, FL 32301	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					SR 93	BAY	123456-1-52-01	

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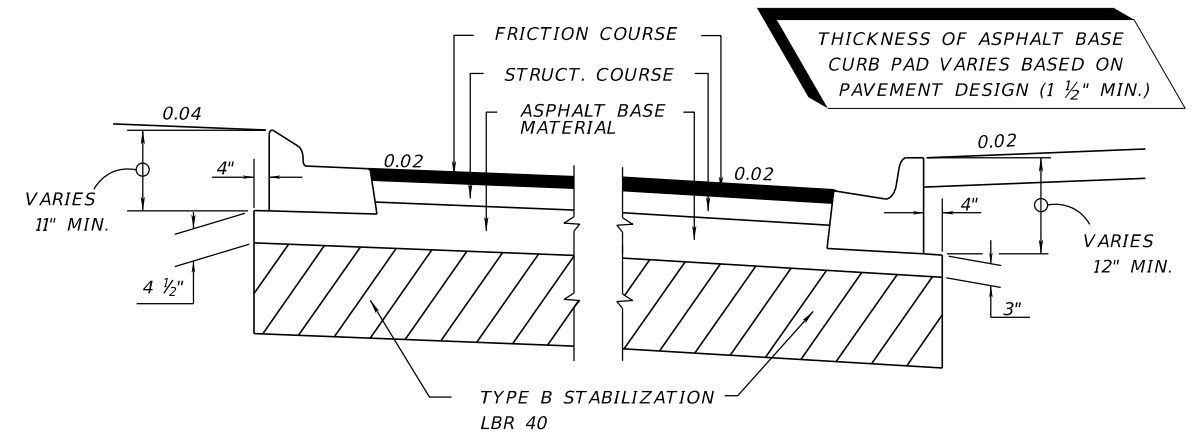
**TYPICAL SECTION
SR 22
STA. 98+40.00 TO STA. 202+33.00**

TRAFFIC DATA

CURRENT YEAR = 2018 AADT = 22800
 ESTIMATED OPENING YEAR = 2020 AADT = 25800
 ESTIMATED DESIGN YEAR = 2040 AADT = 30600
 K = 6% D = 55% T = 2% (24 HOUR)
 DESIGN HOUR T = 1%
 DESIGN SPEED = 30 MPH
CONTEXT CLASSIFICATION = C2T

TRAVEL AND BIKE LANES

~~OPTIONAL~~ BASE GROUP 9 (TYPE B-12.5 ONLY) ~~WITH~~
 TYPE SP STRUCTURAL COURSE (TRAFFIC C) (2")
~~AND~~ FRICTION COURSE FC-12.5 (TRAFFIC C) (1 1/2") (PG 76-22)

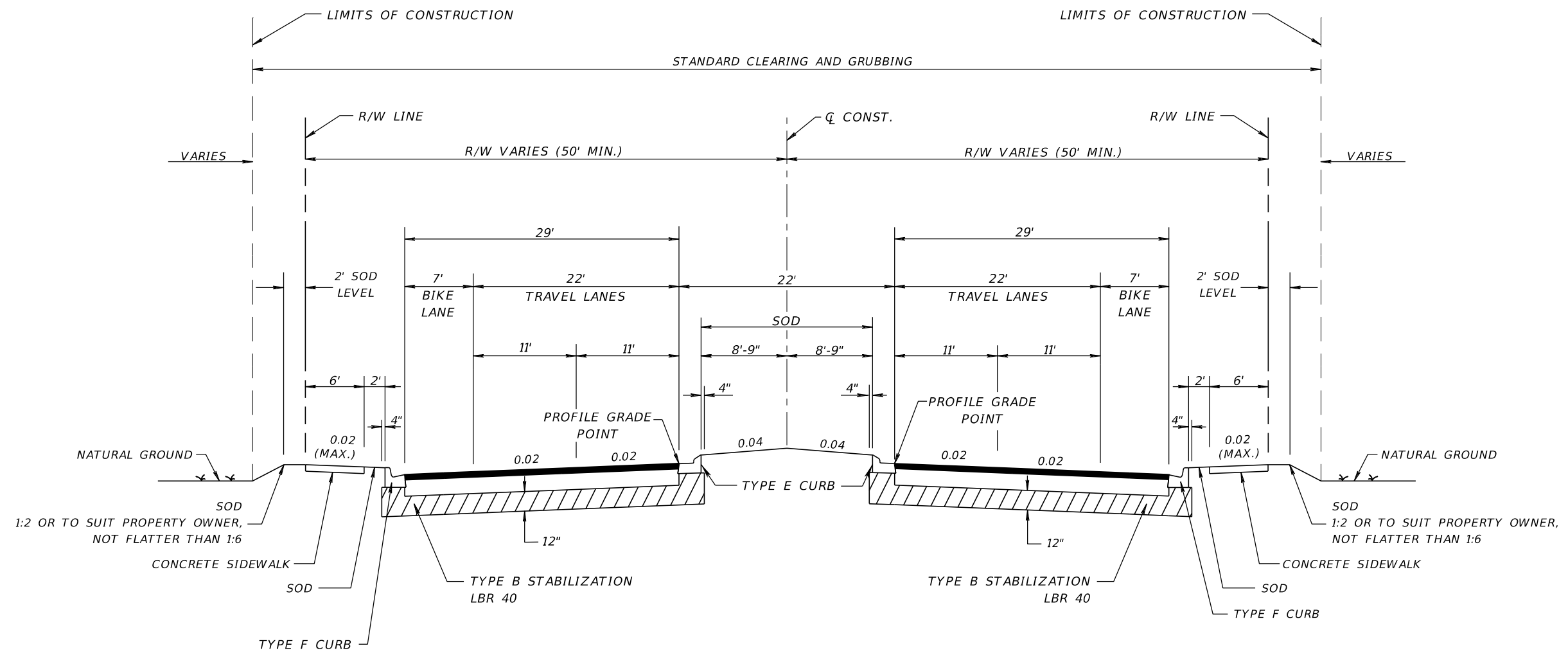


DETAIL OF ASPHALT BASE CURB PAD

**Exhibit 306-4
4-Lane Curbed
Date: 1/1/20**

REVISIONS				LUKE S. WALKER, P.E. P.E. NO.: 99991 ROADWAY ENGINEERS, INC. 123 MAIN STREET TALLAHASSEE, FL 32301	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					SR 22	BAY	123456-1-52-01	

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**TYPICAL SECTION
SR 22
STA. 202+33.00 TO STA. 560+50.00**

TRAFFIC DATA
 CURRENT YEAR = 2018 AADT = 22800
 ESTIMATED OPENING YEAR = 2020 AADT = 25800
 ESTIMATED DESIGN YEAR = 2040 AADT = 30600
 K = 6% D = 55% T = 2% (24 HOUR)
 DESIGN HOUR T = 1%
 DESIGN SPEED = 40 MPH
CONTEXT CLASSIFICATION = C2T

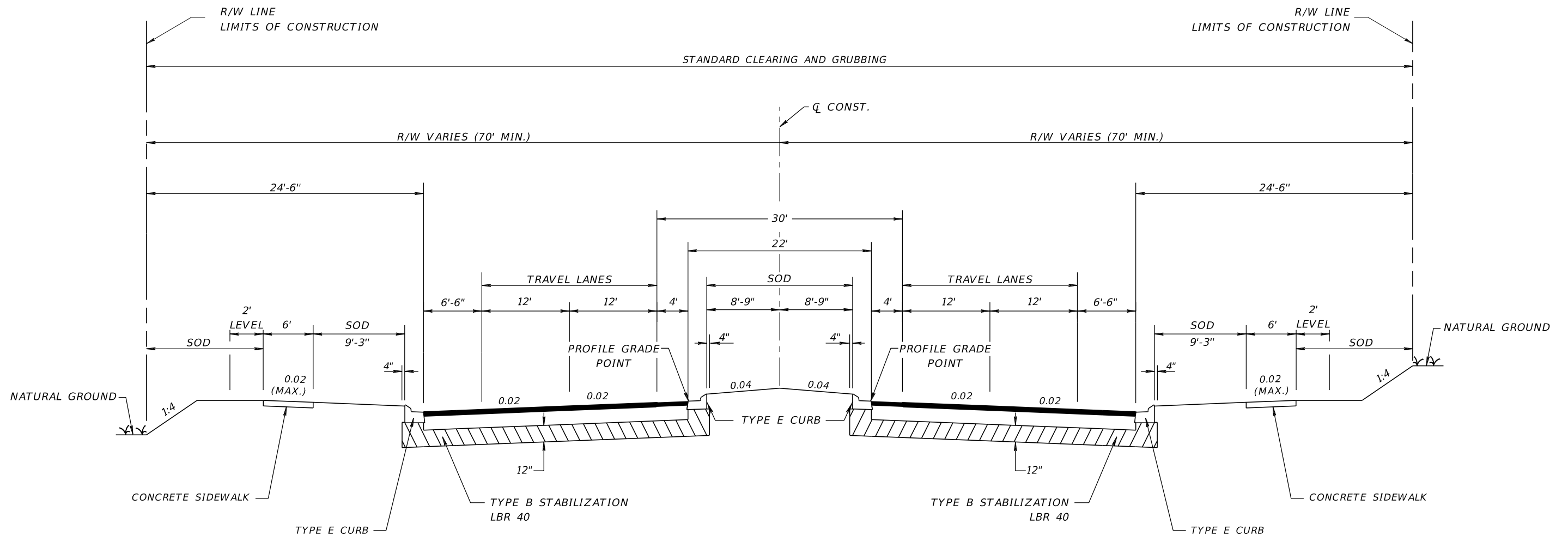
TRAVEL AND BIKE LANES
 OPTIONAL BASE GROUP 9 ~~WITH~~
 TYPE SP STRUCTURAL COURSE (TRAFFIC B) (1 1/2")
~~AND~~ FRICTION COURSE FC-12.5 (TRAFFIC B) (1 1/2") (PG 76-22)

Exhibit 306-5
4-Lane Curbed
Date: 1/1/20

REVISIONS				LUKE S. WALKER, P.E. P.E. NO.: 99991 ROADWAY ENGINEERS, INC. 123 MAIN STREET TALLAHASSEE, FL 32301	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			TYPICAL SECTION	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 22	BAY	123456-1-52-01		

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SDATES STIMES



TYPICAL SECTION
SR 22

STA. 560+50.00 TO STA. 882+25.00

TRAVEL LANES AND SHOULDER PAVEMENT

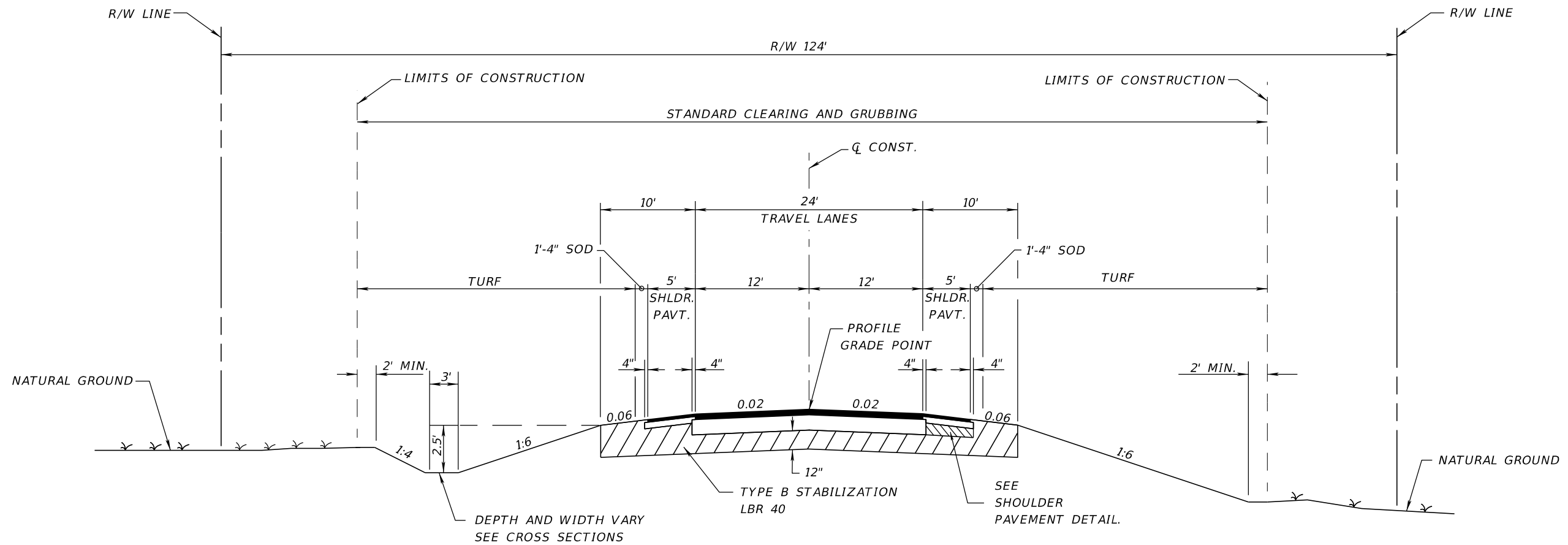
OPTIONAL BASE GROUP 9 ~~WITH~~
TYPE SP STRUCTURAL COURSE (TRAFFIC B) (2 1/2")
~~AND~~ FRICTION COURSE FC-12.5 (TRAFFIC B) (1 1/2") (PG 76-22)

TRAFFIC DATA

CURRENT YEAR = 2018 AADT = 22800
ESTIMATED OPENING YEAR = 2020 AADT = 25800
ESTIMATED DESIGN YEAR = 2040 AADT = 30600
K = 6% D = 55% T = 2% (24 HOUR)
DESIGN HOUR T = 1%
DESIGN SPEED = 50 MPH
CONTEXT CLASSIFICATION = C3

Exhibit 306-6
4-Lane High Speed Curbed
Date: 1/1/21

REVISIONS				LUKE S. WALKER, P.E. P.E. NO.: 99991 ROADWAY ENGINEERS, INC. 123 MAIN STREET TALLAHASSEE, FL 32301	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					SR 22	BAY	123456-1-52-01	TYPICAL SECTION



**TYPICAL SECTION
SR 22
STA. 10+00.00 TO STA. 98+40.00**

TRAFFIC DATA

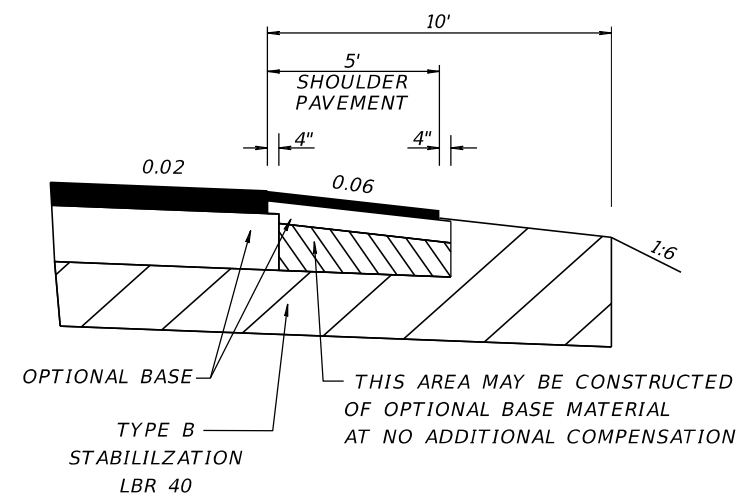
CURRENT YEAR = 2018 AADT = 6800
 ESTIMATED OPENING YEAR = 2020 AADT = 7600
 ESTIMATED DESIGN YEAR = 2040 AADT = 12000
 K = 6% D = 55% T = 2% (24 HOUR)
 DESIGN HOUR T = 1%
 DESIGN SPEED = 55 MPH
CONTEXT CLASSIFICATION = C2

TRAVEL LANES

OPTIONAL BASE GROUP 8 ~~WITH~~
 TYPE SP STRUCTURAL COURSE (TRAFFIC C) (2")
~~AND~~ FRICTION COURSE FC-12.5 (TRAFFIC C) (1 1/2") (PG 76-22)

SHOULDER PAVEMENT

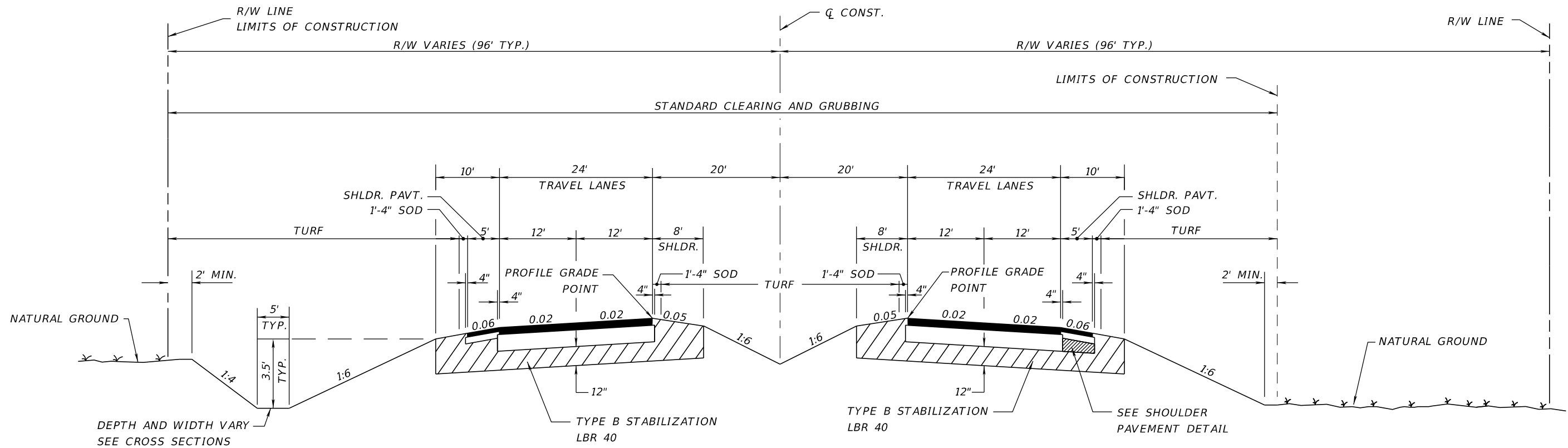
OPTIONAL BASE GROUP 1 ~~WITH~~
 FRICTION COURSE FC-12.5 (TRAFFIC C) (1 1/2") (PG 76-22)



SHOULDER PAVEMENT DETAIL

Exhibit 306-7
 2-Lane Flush Shoulder
 Date: 1/1/20

REVISIONS				LUKE S. WALKER, P.E. P.E. NO.: 99991 ROADWAY ENGINEERS, INC. 123 MAIN STREET TALLAHASSEE, FL 32301	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					SR 22	BAY	123456-1-52-01	



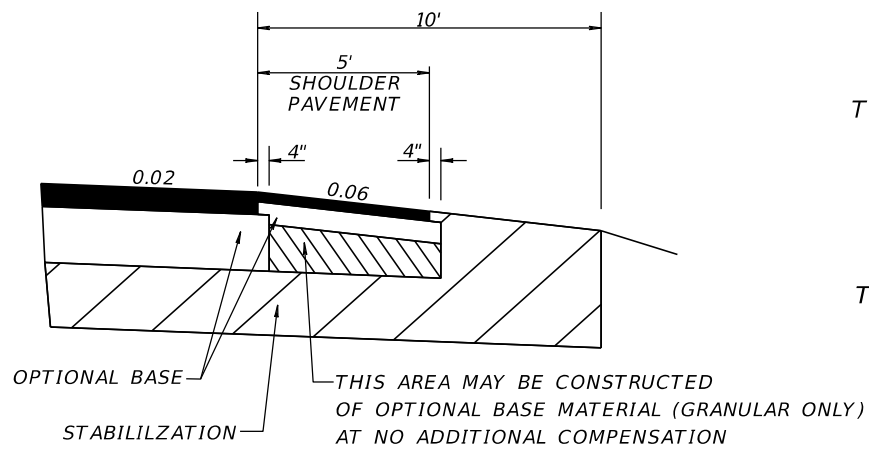
TRAFFIC DATA

CURRENT YEAR = 2018 AADT = 22300
 ESTIMATED OPENING YEAR = 2020 AADT = 23300
 ESTIMATED DESIGN YEAR = 2040 AADT = 51500
 K = 9% D = 56% T = 10% (24 HOUR)
 DESIGN HOUR T = 5%
 DESIGN SPEED = 55 MPH
 CONTEXT CLASSIFICATION = C1

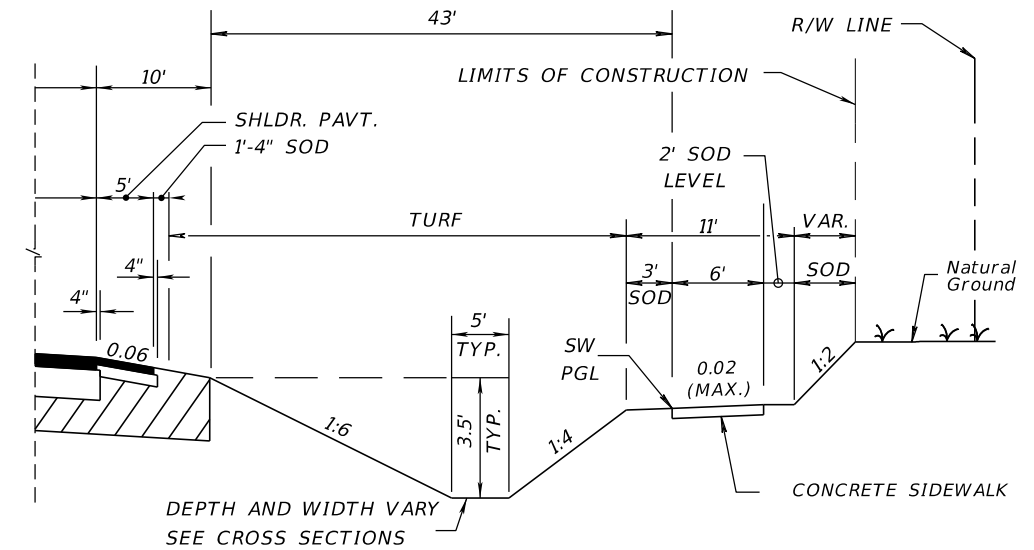
**TYPICAL SECTION
 SR 22
 STA. 63+65.42 TO STA. 328+65.14**

TRAVEL LANES
 OPTIONAL BASE GROUP 9 ~~WITH~~
 TYPE SP STRUCTURAL COURSE (TRAFFIC ~~D~~ E) (2")
 TYPE SP STRUCTURAL COURSE (TRAFFIC ~~D~~ E) (1 1/2") (PG 76-22)
~~AND~~ FRICTION COURSE FC-5 (3/4") (PG 76-22)

SHOULDER PAVEMENT
 OPTIONAL BASE GROUP 1 ~~WITH~~
 TYPE SP STRUCTURAL COURSE (TRAFFIC ~~D~~ E) (1 1/2") (PG 76-22)
~~AND~~ FRICTION COURSE FC-5 (3/4") (PG 76-22)



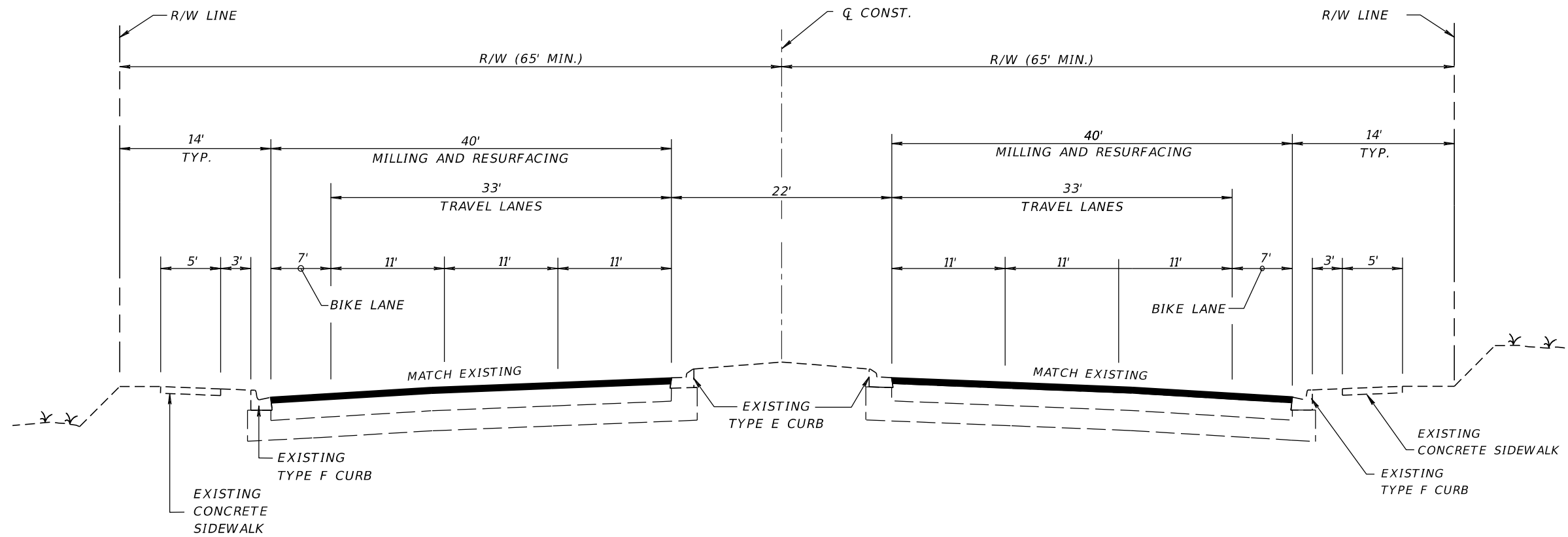
SHOULDER PAVEMENT DETAIL



**TYPICAL SECTION
 STA. 157+75.40 TO STA. 215+45.22**

Exhibit 306-8
 4-Lane Flush Shoulder
 Date: 1/1/20

REVISIONS				LUKE S. WALKER, P.E. P.E. NO.: 99991 ROADWAY ENGINEERS, INC. 123 MAIN STREET TALLAHASSEE, FL 32301	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					SR 22	BAY	123456-1-52-01	TYPICAL SECTION



**TYPICAL SECTION
SR 22**

STA. 101+21.00 TO STA. 221+44.00

TRAVEL AND BIKE LANES

MILL EXISTING ASPHALT PAVEMENT (1 1/2" AVG. DEPTH)
FRICTION COURSE FC-12.5 (TRAFFIC C) (1 1/2") (PG 76-22)

TRAFFIC DATA

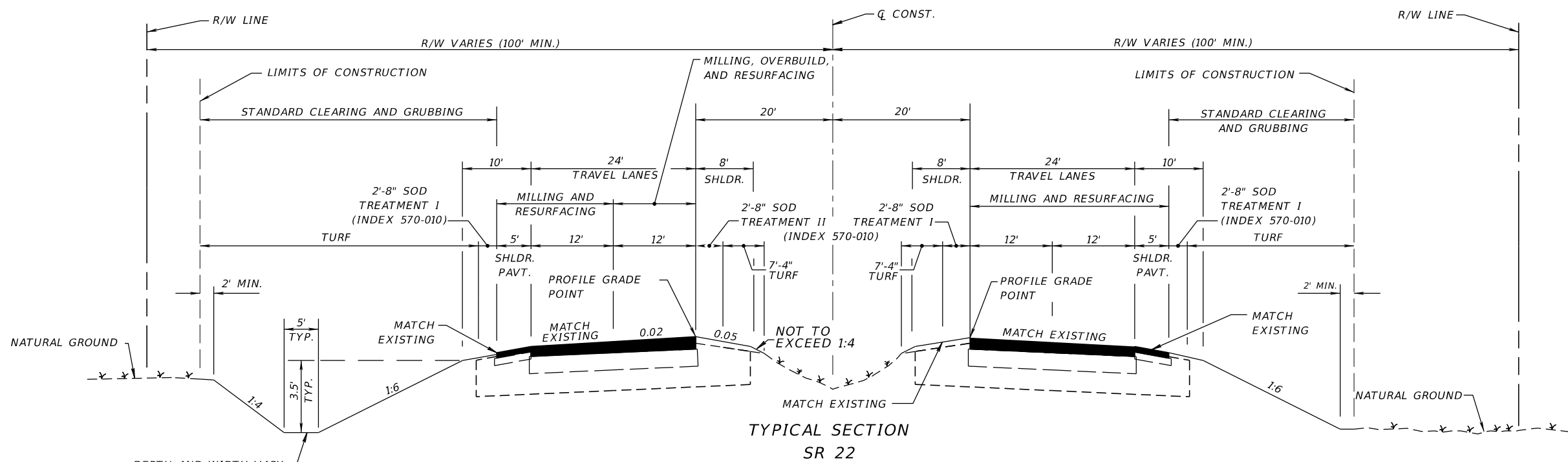
CURRENT YEAR = 2018 AADT = 22800
 ESTIMATED OPENING YEAR = 2020 AADT = 25800
 ESTIMATED DESIGN YEAR = 2040 AADT = 30600
 K = 6% D = 55% T = 2% (24 HOUR)
 DESIGN HOUR T = 1%
 DESIGN SPEED = 45 MPH
CONTEXT CLASSIFICATION = C3

Exhibit 306-9
6-Lane Curbed
Date: 1/1/20

REVISIONS				LUKE S. WALKER, P.E. P.E. NO.: 99991 ROADWAY ENGINEERS, INC. 123 MAIN STREET TALLAHASSEE, FL 32301	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.
DATE	DESCRIPTION	DATE	ROAD NO.		COUNTY	FINANCIAL PROJECT ID		
			SR 22		BAY	123456-1-52-01	TYPICAL SECTION	

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TYPICAL SECTION
SR 22

STA. 145+00.00 TO STA. 166+00.00

NOTE: SEE OVERBUILD AND RESURFACING DETAIL FOR INSIDE SOUTHBOUND LANE.

TRAFFIC DATA

CURRENT YEAR = 2018 AADT = 18100
 ESTIMATED OPENING YEAR = 2020 AADT = 21000
 ESTIMATED DESIGN YEAR = 2036 AADT = 38900
 K = 11% D = 58% T = 22% (24 HOUR)
 DESIGN HOUR T = 11%
 DESIGN SPEED = 60 MPH
 POSTED SPEED = 55 MPH
CONTEXT CLASSIFICATION = C2

**SOUTHBOUND
INSIDE TRAVEL LANE**

MILL EXISTING ASPHALT PAVEMENT (3" DEPTH)
 OVERBUILD TYPE SP STRUCTURAL COURSE (TRAFFIC ~~D~~ E) (THICKNESS VARIES)
~~RESURFACE WITH~~ TYPE SP STRUCTURAL COURSE (TRAFFIC ~~D~~ E) (1 1/2") (PG 76-22)
~~AND~~ FRICTION COURSE FC-5 (3/4") (PG 76-22)

**SOUTHBOUND OUTSIDE TRAVEL LANE
NORTHBOUND TRAVEL LANES**

MILL EXISTING ASPHALT PAVEMENT (1 1/2" DEPTH)
~~RESURFACE WITH~~ TYPE SP STRUCTURAL COURSE (TRAFFIC ~~D~~ E) (1 1/2") (PG 76-22)
~~AND~~ FRICTION COURSE FC-5 (3/4") (PG 76-22)

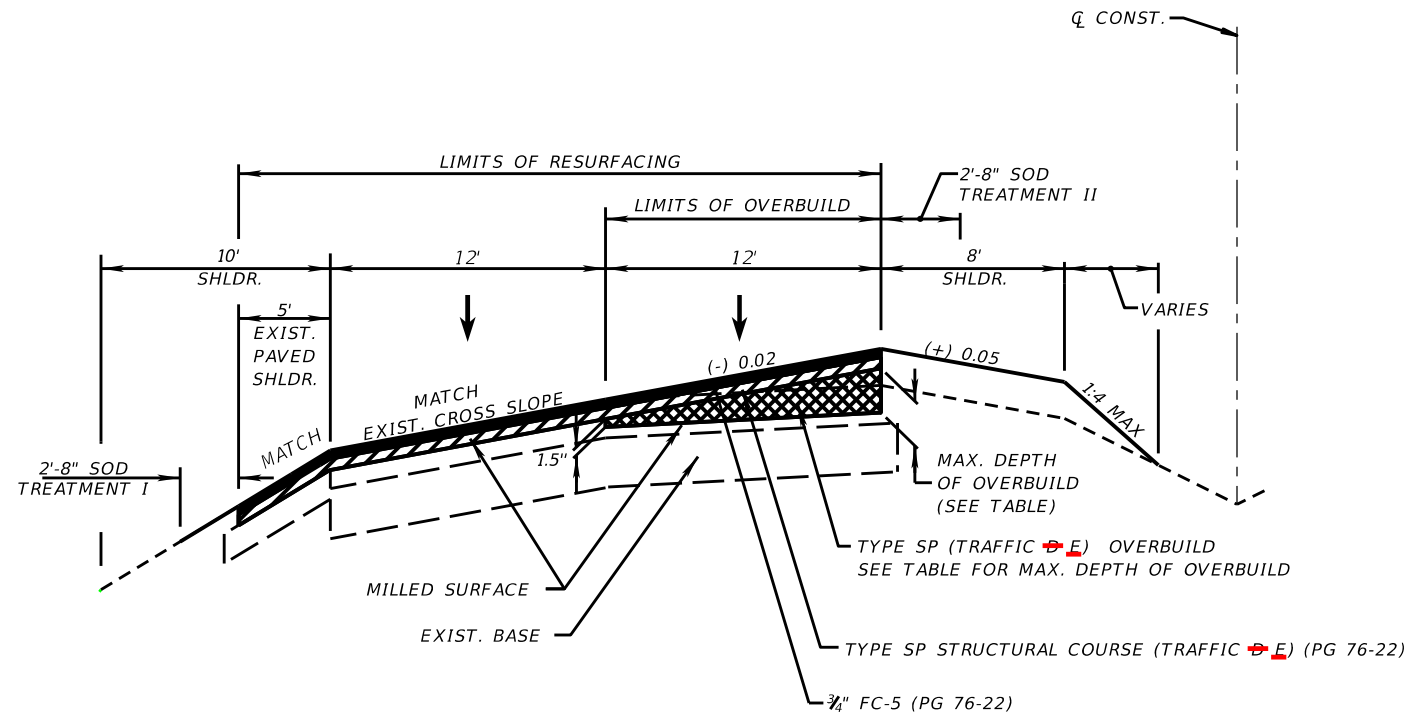
OUTSIDE SHOULDER PAVEMENT

MILL EXISTING ASPHALT PAVEMENT (1 1/2" DEPTH)
~~RESURFACE WITH~~ TYPE SP STRUCTURAL COURSE (TRAFFIC ~~D~~ E) (1 1/2") (PG 76-22)
~~AND~~ FRICTION COURSE FC-5 (3/4") (PG 76-22)

Exhibit 306-10A
 4-Lane Flush Shoulder
 Date: 1/1/21

REVISIONS				LUKE S. WALKER, P.E. P.E. NO.: 99991 ROADWAY ENGINEERS, INC. 123 MAIN STREET TALLAHASSEE, FL 32301	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					SR 22	BAY	123456-1-52-01	

SOUTHBOUND INSIDE LANE
CROSS SLOPE CORRECTION



OVERBUILD
AND RESURFACING DETAIL
NTS
STA. 145+00.00 TO STA. 166+00.00

SR 22 SOUTHBOUND LANES

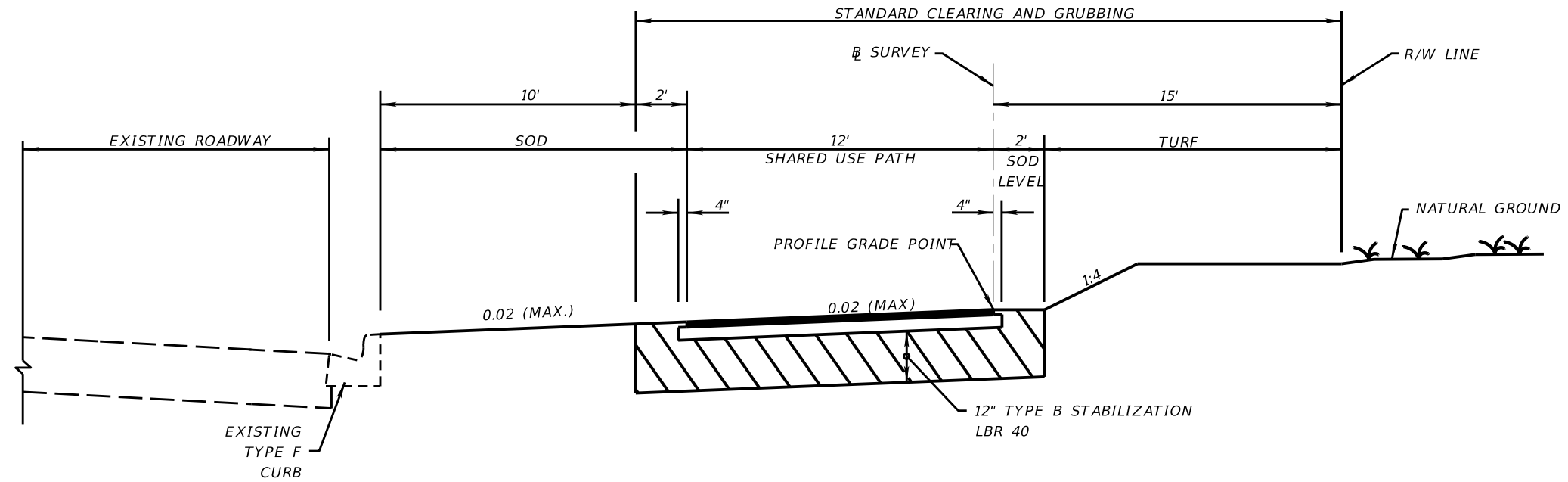
OVERBUILD DETAILS						
LOCATION		EXIST. SLOPE (%)	PROPOSED SLOPE (%)	MAX. DEPTH OF OVERBUILD (IN.)	WIDTH OF OVERBUILD (FT.)	AREA OF OVERBUILD (SQ. FT.)
STATION	LANE					
145+00.00	SOUTHBOUND - INSIDE	(+) 1.6	EXIST.	0.0	12.0	0.0
146+00.00	SOUTHBOUND - INSIDE	(+) 1.0	(-) 2.0	5.1	12.0	2.8
147+00.00	SOUTHBOUND - INSIDE	(+) 1.6	(-) 2.0	5.8	12.0	3.1
148+00.00	SOUTHBOUND - INSIDE	(+) 0.9	(-) 2.0	4.7	12.0	2.5
149+00.00	SOUTHBOUND - INSIDE	(+) 0.4	(-) 2.0	3.9	12.0	2.2
150+00.00	SOUTHBOUND - INSIDE	(+) 0.9	(-) 2.0	4.5	12.0	2.5
151+00.00	SOUTHBOUND - INSIDE	(+) 0.4	(-) 2.0	3.5	12.0	1.9
152+00.00	SOUTHBOUND - INSIDE	(+) 0.3	(-) 2.0	3.8	12.0	2.1
153+00.00	SOUTHBOUND - INSIDE	(+) 0.0	(-) 2.0	3.4	12.0	1.9
154+00.00	SOUTHBOUND - INSIDE	(+) 0.6	(-) 2.0	4.2	12.0	2.3
155+00.00	SOUTHBOUND - INSIDE	(+) 1.2	(-) 2.0	5.2	12.0	2.8
156+00.00	SOUTHBOUND - INSIDE	(+) 1.4	(-) 2.0	5.6	12.0	3.0
157+00.00	SOUTHBOUND - INSIDE	(+) 0.8	(-) 2.0	4.7	12.0	2.9
158+00.00	SOUTHBOUND - INSIDE	(+) 1.1	(-) 2.0	5.6	12.0	3.0
159+00.00	SOUTHBOUND - INSIDE	(+) 1.0	(-) 2.0	4.9	12.0	2.6
160+00.00	SOUTHBOUND - INSIDE	(+) 1.2	(-) 2.0	5.4	12.0	2.9
161+00.00	SOUTHBOUND - INSIDE	(+) 2.2	(-) 2.0	7.5	12.0	4.1
162+00.00	SOUTHBOUND - INSIDE	(+) 2.2	(-) 2.0	7.1	12.0	3.8
163+00.00	SOUTHBOUND - INSIDE	(+) 1.2	(-) 2.0	5.4	12.0	2.9
164+00.00	SOUTHBOUND - INSIDE	(+) 0.8	(-) 2.0	4.7	12.0	2.5
165+00.00	SOUTHBOUND - INSIDE	(+) 0.6	(-) 2.0	4.6	12.0	2.4
166+00.00	SOUTHBOUND - INSIDE	(+) 1.5	EXIST.	0.0	12.0	0.0

Include the subtotals in the Summary of Pavement sheet as a line item named "Summary of Overbuild". Do not include contingency quantities associated with overbuild.

Exhibit 306-10B
Overbuild Details
Date: 1/1/20

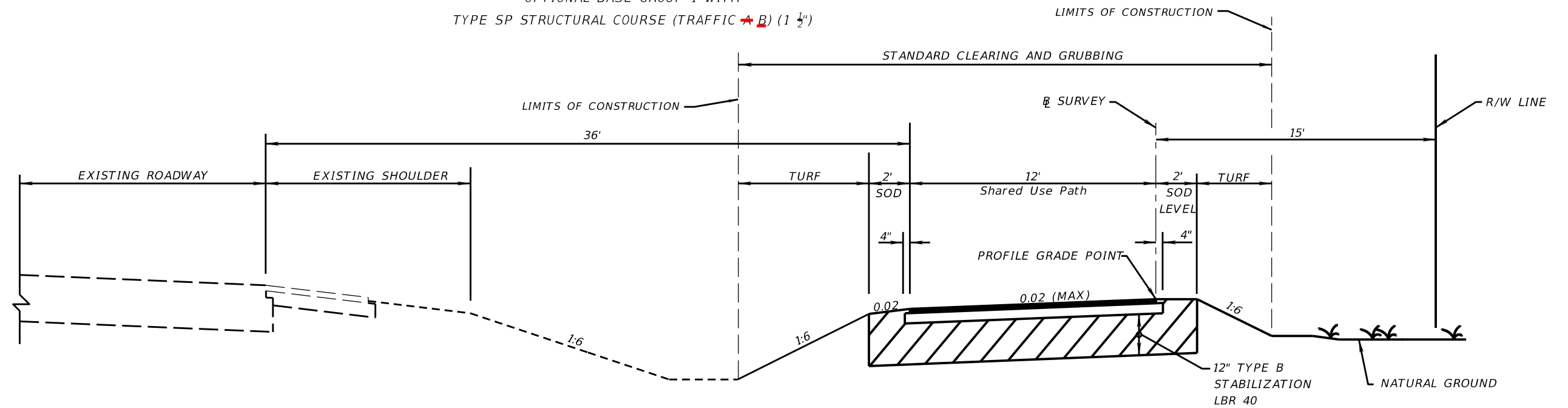
REVISIONS				LUKE S. WALKER, P.E. P.E. NO.: 99991 ROADWAY ENGINEERS, INC. 123 MAIN STREET TALLAHASSEE, FL 32301	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					SR 22	BAY	123456-1-52-01	

TYPICAL SECTION



TYPICAL SECTION
 SR 22 (WILLOW BEND WAY)
 STA. 122+00.000 TO STA. 210+65.000

SHARED USE PATH
 OPTIONAL BASE GROUP 1 WITH
 TYPE SP STRUCTURAL COURSE (TRAFFIC A B) (1 1/2")



TYPICAL SECTION
 SR 22 (WILLOW BEND WAY)
 STA. 210+65.000 TO STA. 305+15.000

SHARED USE PATH
 OPTIONAL BASE GROUP 1 WITH
 TYPE SP STRUCTURAL COURSE (TRAFFIC A B) (1 1/2")

Exhibit 306-11
 Shared Use Path
 Date: 1/1/18

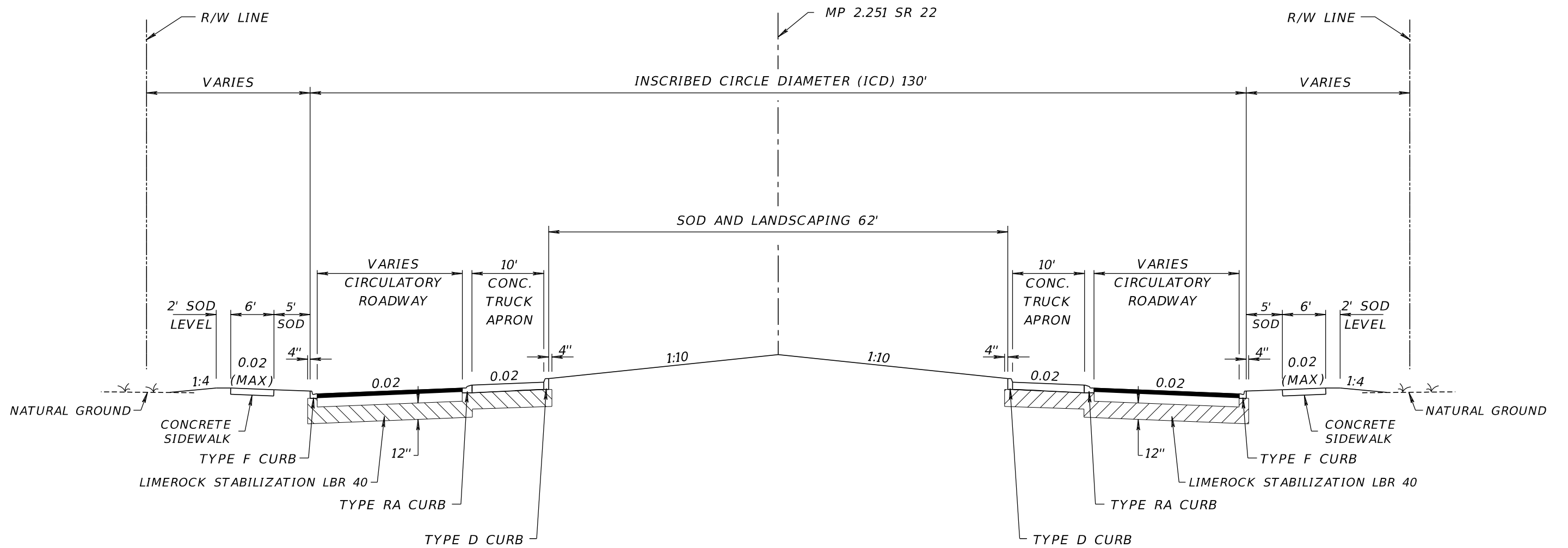
REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

LUKE S. WALKER, P.E.
 P.E. NO.: 99991
 ROADWAY ENGINEERS, INC.
 123 MAIN STREET
 TALLAHASSEE, FL 32301

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 22	BAY	123456-1-52-01

TYPICAL SECTION

SHEET NO.



TYPICAL SECTION
MP 2.251 SR 22 = Q ALDERAAN RD.

TRAFFIC DATA

CURRENT YEAR = 2018 AADT = 22800
 ESTIMATED OPENING YEAR = 2020 AADT = 25800
 ESTIMATED DESIGN YEAR = 2040 AADT = 30600
 K = 6% D = 55% T = 2% (24 HOUR)
 DESIGN HOUR T = 1%
CONTEXT CLASSIFICATION = N/A

CIRCULATORY ROADWAY

OPTIONAL BASE GROUP 9 ~~WITH~~
 TYPE SP STRUCTURAL COURSE (TRAFFIC C) (1")
~~AND~~ FRICTION COURSE FC-9.5 (TRAFFIC C) (2")

Exhibit 306-12
Roundabout
Date: 1/1/21

NOT TO SCALE

REVISIONS				LUKE S. WALKER, P.E. P.E. NO.: 99991 ROADWAY ENGINEERS, INC. 123 MAIN STREET TALLAHASSEE, FL 32301	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.
DATE	DESCRIPTION	DATE	ROAD NO.		COUNTY	FINANCIAL PROJECT ID		
			SR 22		BAY	123456-1-52-01	TYPICAL SECTION	

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

307 Summary of Quantities

The Summary of Quantities sheets are no longer produced for contract plans. ~~(See **FDM 902** for guidance on the Estimated Quantities Report and Summary of Pay Item Reports.~~

308 Summary of Drainage Structures and Optional Materials Tabulation

308.1 General

The Summary of Drainage Structures sheet will no longer be produced. See **FDM 902** for guidance on the Estimated Quantities Report.

The Optional Materials Tabulation sheet is included when providing acceptable options for pipe material and sizes that will satisfy the Design Service Life. The sheet format is available in the FDOT CADD Software.

See **Exhibits 308-1** and **308-2** for illustrations of Optional Materials Tabulation sheets.

308.2 Optional Materials Tabulation

Optional culvert materials must be considered for all culverts; however, culvert extensions and end section replacements are to match the existing culvert material. See Chapter 8 of the [Drainage Design Guide](#) for more information.

Conduct an Optional Pipe Materials Analysis and prepare an Optional Materials Tabulation sheet to be placed in the plans.

The Optional Material Tabulation sheet is to include:

- (1) Structure number, or description
- (2) Design service life (DSL)
- (3) Size
- (4) Material and thickness or class, corrugation requirements, protective coating

Modification for Non-Conventional Projects:

Delete **FDM 308.2** and see **Chapter 6** of the [Drainage Manual](#) for Optional Material requirements. Designate installed material on the Optional Materials Sheet or on the as-built plan view.

Exhibit 308-1: Optional Materials Tabulation

Exhibit 308-2: Optional Materials Tabulation

309 Project Layout

309.1 General

The project layout sheet is an optional sheet that the district may choose to include in the plans set. This sheet shows the horizontal alignment and plan or plan-profile sheet sequence and numbering for the project. The project layout sheet provides clarity and detailed information on complex projects involving interchanges with many connecting routes. If included in the plans set, this sheet should also show all survey reference points.

Modification for Non-Conventional Projects:

Delete the above paragraph and replace with the following:

The project layout sheet shows the horizontal alignment and plan or plan-profile sheet sequence and numbering for the project.

See **Exhibit 309-1** for an illustration of the Project Layout sheet.

Use the standard plan format sheet provided in the FDOT CADD Software to prepare the project layout sheet. Use a scale that provides clarity and legibility. Place a north arrow and scale in a conspicuous location, typically in the upper right portion of the sheet. For large or complicated projects, more than one sheet may be required to clearly depict all required information. Use match lines when multiple project layout sheets are needed.

309.2 Alignment Sheet Sequence

Show complete project alignment with baseline of survey and/or centerline of construction. Show edge of pavements if scale permits. Superimpose on the alignment the outlines of the plan, or plan-profile sheets to depict the sheet sequence with relation to the alignment stationing. Include the appropriate plan sheet number on each sheet outline. Plan or plan-profile sheet numbering must be in the following order:

- (1) Mainline (for widely separated roadways, the right roadway in the direction of stationing takes precedence)
- (2) Crossroads

- (3) Ramps
- (4) Frontage roads
- (5) Access roads

Flag and label beginning and ending stations for project, construction and ramps, including equations and/or exceptions.

Modification for Non-Conventional Projects:

Delete **FDM 309.2** above and replace with:

309.2 Alignment Sheet Sequence

Show complete project alignment with baseline of survey and/or centerline of construction. Flag and label beginning and ending stations for project, construction and ramps, including equations.

310 Project Control

310.1 General

The Project Control sheet provides a summary of horizontal and vertical datum (i.e., reference points, benchmarks and control points). The datum shown on this sheet must provide clear and sufficient information to establish horizontal and vertical control during the construction of the project. The data shown can be extracted from the project network control survey and historical control data, or reflect assumed datum. The Engineer of Record will create the Project Control sheet from data extracted from the project survey and sign and seal the Project Control sheet.

These sheets are to be placed in the component plans in accordance with **FDM 302.6**.

See **Exhibits 310-1** through **310-3** for examples of a Project Control sheet.

310.2 Sheet Setup

Use the standard plan format sheet provided in the FDOT CADD Software to prepare the sheet. Use standard symbols contained in the [CADD Manual](#).

Provide a note on the Project Control sheet that identifies horizontal and vertical datum that the survey is based on.

310.3 Reference Points

Reference points are prominent, easily located points in the terrain used to define a location of another point that is located on the baseline of survey. The purpose of reference points is provide horizontal location to re-establish primary control points along the baseline of survey. Reference points should not be located on the baseline. Detailed descriptions of each reference point is illustrated with a sketch.

Place survey reference points on the Project Control sheet along the top of the sheet or where other space allows. Clearly indicate the baseline of survey and reference points, including all ties. Complete length of survey baseline between two consecutive reference points need not be shown. Clearly label each reference point, beginning at the first reference point within the limits of the project, and progressing in the direction of stationing. Reference points need not be drawn to any particular scale, but distances and angles shown must be proportionate.

310.4 Benchmarks

Benchmarks provide a known elevation that is used as the basis for measuring the elevation of other topographical points. When benchmarks are not used to provide horizontal control, they may be placed on the Project Control sheet along the bottom of the sheet or where other space allows. At a minimum, benchmarks are to include:

- (1) Identifying name (e.g., BM No. 9)
- (2) Description (e.g., nail in tree, concrete monument)
- (3) Station and offset
- (4) Elevation (in feet to two decimal places)

310.5 Control Points (Horizontal and Vertical Datum)

Control points provide information for the location and elevation of established monuments. Control points that provide vertical datum are also known as benchmarks.

Place the following information for the control points in a table titled Horizontal and Vertical Control:

- (1) Point Name – Often identified on the stamped disk placed on the established monument.
- (2) Northing and Easting – Show to three decimal places. If control point serves only as a Benchmark show Northing and Easting to the nearest foot, more or less.
- (3) Scale Factor – Show to ~~nine~~eight decimal places.
- (4) Latitude and Longitude – Show seconds to five decimal places. If control point serves only as a Benchmark show Latitude and Longitude to the nearest second.
- (5) Baseline Station and Offset – Show to two decimal places.
- (6) Elevation – if control point only serves as horizontal control show elevation as “N/A”.
- (7) Description – indicate the size, type, if the monument is “found” or “set” and include the monument ID number.

When this table is the sole means to convey horizontal and vertical datum, include a project sketch on the Project Control sheet that provides a visual reference for the location of the control points. The sketch does not need to be any particular scale but must provide clarity and legibility. Include the following information on the sketch:

- (1) Show the baseline of survey with stationing.

- (2) Flag and label beginning and ending stations for project.
- (3) Show bearings for all tangent sections, in the direction of stationing.
- (4) Label PC and PT points and show horizontal curve data.
- (5) Indicate graphically the location of intersecting roadways and railroads.
- (6) Indicate Township, Range and Sections that the survey traverses. Show the location where section lines cross the baseline of survey.
- (7) Place a north arrow and scale in a conspicuous location, typically in the upper right portion of the sheet.

311 General Notes

311.1 General

General notes provide information and direction to the contractor by clarifying design details or construction practices. General notes are project-specific and must not restate, broaden or curtail requirements in the [Standard Specifications](#) or [Standard Plans](#).

General notes are not a substitute for specifications; refer to the Specifications Handbook for guidance. Contact the District Specifications Office for assistance with Modified Special Provisions, Technical Special Provisions, or other specification needs.

Place general notes on a standard plan sheet available in the FDOT CADD Software. Place the General Notes sheet before the first roadway plan-profile sheet in the plans set. See **Exhibit 311-1** for an example of a General Notes sheet.

311.2 Writing General Notes

It is important to choose words carefully when writing general notes; i.e., be precise and concise. Use terminology and abbreviations commonly used in the [Standard Specifications](#) and [Standard Plans](#).

When a general note requires an action by the contractor, the note is written as a command. Do not include “Contractor must”, “by the Contractor”, or similar phrases in general notes. The following are examples of general notes written as a command:

- (1) Sawcut existing pavement at a 1” depth at the limits of milling operations.
- (2) Erect new overhead signs and sign supports before removing existing sign structures.
- (3) Remove memorial markers that are in conflict with construction. Provide an inventory that includes the name on the marker and the location (station and offset) from where it was removed. Deliver the markers and inventory to the FDOT Maintenance Engineer at 888 Poppy Seed Lane, Ft. Lauderdale.
- (4) Do not stage equipment or stockpile materials adjacent to Lake Worth Drainage District canals.

311.2.1 Required General Notes

Place the following notes on the General Notes sheet:

- (1) Benchmark elevations shown on the plans are {note the benchmark datum used in the plans; e.g., North American Vertical Datum of 1988 (NAVD 88)}.
- (2) All survey information was obtained from a licensed Florida Professional Surveyor and Mapper and utilized as supporting data in the production of design plans and for construction on subject project. The professional surveyor and mapper of record is:
 {Surveyor name, P.S.M.}
 {P.S.M. NO: #}
 {Company Name}
 {Company Address}
 {Certificate of Authorization: #}
- (3) The location(s) of the utilities shown in the plans (including those designated Vv, Vh, and Vvh) are based on limited investigation techniques and should be considered approximate only. The verified locations/elevations apply only at the points shown. Interpolations between these points have not been verified.
- (4) Utility/Agency Owners Company Contact Telephone Numbers
 {Company Name} {Contact Name} (XXX) XXX-XXXX
- (5) Special event days for this project include:
 {List special events}
- (6) All roadway work within the railroad right-of-way must be completed in ____ consecutive calendar days (to be determined jointly by the District Construction and Rail Offices). The work to be completed includes all items necessary to relieve the flagman from providing protective services.

311.2.2 Bridge Clearance

For projects affecting an existing bridge (e.g., bridge widenings or resurfacing) that propose a minimum design vertical clearance between 16'-0" and 16'-2" or if a Design Variation or Design Exception is required, place the following general note in the plans:

“When construction is complete, submit a certified survey confirming the as-built minimum vertical clearance is equal to or greater than the minimum design vertical clearance called for in the plans.”

Exhibit 311-1 General Notes

312 Roadway Plan-Profile

312.1 General

The Roadway Plan-Profile sheet provides the complete horizontal and vertical alignments for the project. Various roadway elements such as pavement width, medians, paved shoulders, curbs, drainage elements, tapers, turn provisions, and intersecting roadways, are shown on this sheet.

Prepare the Roadway Plan-Profile sheet according to the standard formatted sheets that are contained in the FDOT CADD Software. Recommended scales for facility locations are as follows:

<u>Location</u>	<u>Horizontal Scale</u>
Inside Urban Boundary	1" = 40'/50'
Outside Urban Boundary	1" = 100'/200'

When appropriate, the plan-profile sheet may be divided into separate plan sheets and profile sheets.

312.2 Roadway Plan Portion

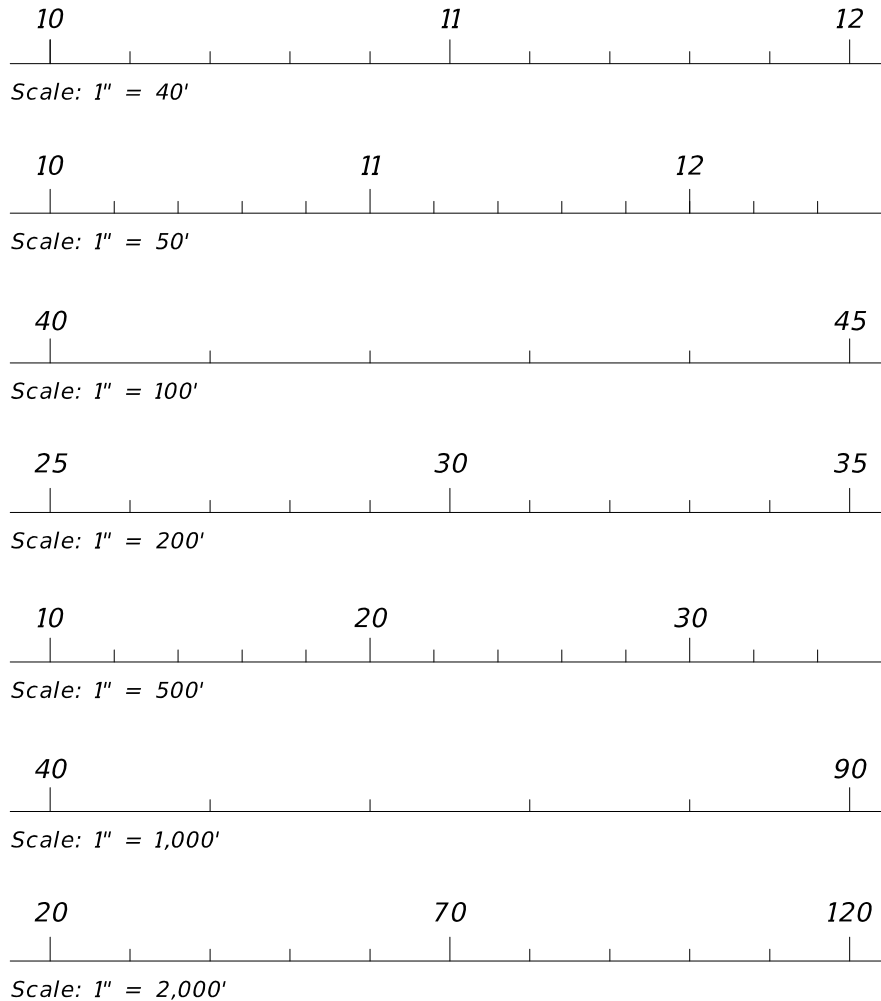
312.2.1 Centerline

Place the baseline of survey or centerline of construction in the center of the plan portion of the sheet, with stationing increasing from left to right. For resurfacing projects, simple projects, or sections of a project without a profile view, "stacking" multiple plans on one sheet is optional if clarity and legibility are maintained. When multiple plan views are shown on a plan sheet, they must be stacked from top to bottom. When the alignment includes horizontal curves, lay the centerline on the sheet in such a manner to avoid breaks or match lines (except at the beginning or end of the sheet).

Place "tick" marks on the upper side of the centerline at every station as shown in **Figure 312.2.1**. Place intermediate ticks between the station ticks. Intermediate ticks should be approximately half the length of station ticks.

Place station numbers close to station ticks for scales up to and including 1" = 50' and outside the R/W lines for smaller scales.

Figure 312.2.1 Centerline Station Numbering and Tick Marks



Show bearings for tangent sections (in the direction of stationing) below the baseline and centerline. Where appropriate, tie intersecting roads or streets by station and angle/bearings to the baseline or centerline. Section lines or city limits must be tied by station and angle/bearings to the baseline or centerline.

In cases where the construction centerline does not coincide with the survey baseline, the construction centerline must be identified with complete alignment data and tied to the survey baseline; however, the construction centerline need not be shown when it is uniformly offset from the survey baseline for the entire length of the project and is shown on the typical section. Show all station equations occurring on the survey baseline and those equating the survey baseline and construction centerline.

Place a north arrow and scale at a point of maximum visibility, typically in the upper right portion of the plan view.

312.2.2 Horizontal Curves

Designate PC and PT points of horizontal curves by small circles with short radial lines from these points. Designate PI points by a small triangle with a short section of tangent on either side.

Properly orient the horizontal curves within the plan view when clipping plan sheets. Repeat the curve data on each sheet when a curve extends over more than one plan sheet. Show horizontal curve data using the following format:

CURVE DATA

PI	(Station)
Δ	(Delta Angle with Direction)
D	(Degree of Curve)
T	(Tangent Length)
L	(Length of Curve)
R	(Radius Length)
PC	(Station)
PT	(Station)
e	(Superelevation Rate)

312.2.3 Existing Topography

Show and label all existing topography, including roads, streets, drives, buildings, underground and overhead utilities, walls, curbs, pavements, fences, railroads, bridges, drainage structures and similar items. Also show streams, ponds, lakes, wooded areas, ditches and other physical features. Existing gasoline storage tanks within limits of topographical survey must be shown.

Show and label all existing utilities. If the type of utility is unknown it should be labeled as such. Indicate the line voltage for all overhead electrical power lines. Use standard symbols contained in the FDOT CADD Software.

312.2.4 Construction and Project Limits

Flag and station the following limits:

- (1) Begin project and end project. Project limits should be at the beginning and the end of the full typical sections. Begin construction and end construction where construction limits are other than project limits. Transitions for maintenance of traffic and other construction work such as feathering, friction course, guardrail, drainage work, signing and marking work, and sidewalk may fall outside of the project limits but must be included within the construction limits. If plans include more than one project, identify the limits for each by Financial Project ID. The Engineer of Record is responsible for determining project and construction limits.

Modification for Non-Conventional Projects:

Delete the last sentence of the above paragraph and replace with the following:
The Department will set the project and construction limits.

- (2) The limits of project breakdown necessary for separation of length and quantities for federal aid and non-federal aid projects.
- (3) The limits of each type of construction classification where more than one type is involved, such as, new construction, resurfacing, bridge work, widening, and milling.
- (4) The begin and end limits of project exceptions (excluded areas).
- (5) Station equations.

312.2.5 Drainage Structures and Bridges

Show proposed cross drain pipes, box culverts and three-sided culverts by using a symbol and a drainage structure number. Label cross drain pipe sizes and lengths on plan-profile sheet. Show box and three-sided culvert lengths on drainage structure sheet.

Bridge-sized culverts (a.k.a., bridge culverts) are defined in **FDM 265.1**. Flag and station the begin station and end station for the bridge culvert (outside wall to outside wall). Provide a bridge number and a drainage structure number for all bridge culverts.

Show proposed bridges and approach slabs by simple outline. Flag and station the begin station and end station for the bridge and for the approach slabs. Also provide a bridge

number. Show the existing vertical clearance for any construction affecting existing bridges.

When appropriate, show a short section of lateral ditch/outfall centerline on the Roadway Plan-Profile sheet, and include a note referring to lateral ditch/outfall sheets for details.

Show the proposed drainage system by depicting storm drain pipes with a single line, and the outline of inlets, manholes and junction boxes. The outline of structure bottoms may be shown. Label the pipe size and length between structures. Provide structure numbers for inlets, manholes, junction boxes and special structures.

312.2.6 Plan Layout

Provide the following dimensions or labeling:

- (1) Show R/W lines. Dimension the R/W line only if the applicable typical section shows a varying dimension from the baseline or centerline. Dimensions of the R/W line must be from the centerline or baseline, if survey and construction lines are parallel; otherwise dimension the R/W line from the construction centerline.
- (2) Avoid showing detailed information regarding median openings or intersections when specific details can be grouped on a separate sheet. When this is the case, identify median openings and intersections by station location.
- (3) Label locations along the alignment where traveled way dimensions change, or begin to change, including the station and dimensions of the traveled way.
- (4) Show curb, curb and gutter, traffic separators, sidewalks, curb ramps, retaining walls, and driveways.
- (5) Show stations of return points in tabular form or include on the plan, unless shown on an intersection detail sheet. Also, show offsets, if not governed by a typical.
- (6) Show station of radius points of traffic separator or median curb at median openings on the plan. Elevation of these points must also be shown if not shown in the intersection details sheet.
- (7) Indicate control radii for traffic turns when setting median nose locations, unless shown on the intersection detail sheet.
- (8) Include the station of end of curb and gutter at side street intersections (when end is not at a return point) with proposed gutter grade elevation.
- (9) Indicate the limits of pavement and grading at side street intersections.

- (10) When incidental construction extends beyond the R/W lines, construction easements or license agreements may be required and should be shown on the plan sheets.
- (11) Show the limits of wetlands based on permit or regulatory requirements.
- (12) Show all utilities. Label field verified utilities (see *Quality Level "A" locates, FDM 221,*) in accordance with the following symbol:

V_{vh} = Verified Vertical Elevation and Horizontal Location

Projects with minor utility work or impacts may include these features on the Roadway Plan-Profile sheet.

- (13) Identify all traffic monitoring sites in or within one-half mile of the project limits with the following notation:

Traffic Monitoring Site Number (XXXX)

Roadway Identifying Number (Roadway Characteristics Inventory (RCI) Section #) Milepost (XX.XXX)

Site includes vehicle detectors in roadway and pedestal, pole or base mounted cabinet, buried cable, and solar power unit on R/W.

Inquiries about monitoring sites should be addressed to the Traffic Data Section Manager of the ~~Transportation Statistics Section~~ Transportation Data and Analytics Office, Office of Planning.

312.3 Roadway Profile Portion

312.3.1 General Data

Preformatted plan-profile sheets are located in the FDOT CADD Software. The grid portion of each sheet is used for plotting the project profile. The standard grid pattern for the profile portion of the sheet is five lines per inch, both in the horizontal and vertical. This will accommodate most scales. An optional grid with four lines per inch is available. This sheet may be used if approved by the district.

The horizontal scale for the profile portion of the sheet must be the same as that used for the plan portion. Station limits of the profile must correspond to those of the plan portion of each sheet. Station numbers must be placed across the bottom of the sheet just above the title block. Intervals for profile stations must be the same as those in the plan view.

Select the vertical elevation datum such that the profile will not crowd either the upper or lower limits of the profile format. As a general guideline the vertical scale should be 10% of the horizontal grid. Show the elevation datum on both the left and right sides of the sheet in the space provided adjacent to the grid.

Label the existing ground line profile and show the existing ground line elevations vertically, just above the station numbers at each end of the sheet only. Show and label all high water elevations affecting base clearance or roadway grades. Refer to **Exhibit 312-1** for correct format.

Show station equations and exceptions. Begin and end stations of project, construction, bridge and bridge culverts must also be shown.

312.3.2 Vertical Alignment

Show and label the proposed profile grade. Vertical curve PCs and PTs must be indicated by small circles and PIs by a small triangle with short sections of tangent shown on each side. Show percent grade to three significant decimal places on the tangent line (trailing zeros need not be shown). Extend vertical lines from the PC and PT points and place a dimension line indicating the length of the vertical curve. The PC and PT stations and elevations must be labeled on the vertical lines.

For vertical curves, show the profile grade elevations on even stations and at appropriate intervals. Place the elevations between the dimension line and the grade line. Also, place the curve length, dimension lines and the profile grade elevations above the grade line for sag vertical curves and below the grade line for crest vertical curves. The dimensions and elevations must be placed reasonably near the grade line whenever possible. The PI station and elevation must be noted, lettered vertically above the PI symbol for crest curves and below for sag curves.

Show the profile grade elevation of the beginning and ending station of each sheet vertically just above the grade line, except when the beginning or ending station is on a vertical curve.

312.3.3 Grades

Label percent grade to three decimal places for each tangent section on every sheet (trailing zeros need not be shown). When two tangent grades intersect and no vertical curve is required, label the PI station and elevation vertically, using the same criteria as for vertical curves.

312.3.4 Superelevation and Special Profiles

For non-standard superelevated sections of the project, the beginning and ending superelevation stations should be indicated on the profile with a note:

"For Superelevation details see Special Profiles Sheet"

Other special profiles that cannot be clearly shown on the plan-profile sheets must be referenced in a similar manner to non-standard superelevated sections. For additional information regarding special profiles see **FDM 313**.

312.3.5 Other Profile Features

For flush shoulder roadways, show and label special ditches in the profile. Show percent ditch grade and a beginning or ending ditch PI with elevation and station plus. For multi-lane divided projects, three special ditch grades (right and left roadway ditches and median ditch) sometimes occur at the same location. In such cases, it may be advantageous to show the median ditch at a convenient location on the sheet with a separate elevation datum.

Depict uniform ditches of non-standard depth by a dimension line in the lower portion of the grid and label as a special ditch with location and depth, or show them by flagging the DPIs at each end with station elevation and side. Standard depth ditches are not labeled.

Show special gutter grades in profile for cases where the gutter grades are not controlled by the typical section and no "special profiles" are included in the plans set. Prolongations of gutter profile grades across street intersections must be included on plan-profile sheets if an inlet is not provided before the intersection.

Show storm drain pipes, inlets and manholes along the main line. Pipes must be noted by size. Proposed structures may be shown by structure number only. Show flow line elevations for all pipes entering and leaving the structure.

Plot proposed cross drain pipes and culverts at the correct location and elevation of the proposed structure crossing the centerline of construction. Identify cross drains by structure number only.

Where the project overpasses a road or railroad, the cross section template of the road/railroad under the bridge must be shown at the appropriate location in profile. Except for transverse utilities, do not show underground utilities in profile.

313 Special Profile and Back-of-Sidewalk Profile

313.1 General

Special Profile sheets show profiles of pavement edges or gutter flow lines at street intersections, ramp termini, curb returns, railroad crossings and roadway or bridge sections requiring special superelevation details. Vertical transitions between roadways and bridges may also require special profiling.

Back-of-Sidewalk Profile sheets are used to establish the profile grade of sidewalk that is separated or independent from the roadway. Profiles help ensure the constructability of the project within the R/W without excessive disturbance or rework of adjoining properties. Back-of-sidewalk profiles are also used for checking of stormwater trapped behind the sidewalks and as a major input for establishing centerline grade profiles.

313.2 Special Profile Sheet

Prepare Special Profile sheet as outlined in the following sections.

313.2.1 Intersections

In addition to normal profile grade lines, supplemental profiles and sections at intersections may be necessary to define edge of pavement profiles. Include sections showing pavement surface elevations for nose points and other critical locations. It is important to develop accurate profiles and sections at locations of curbed channelization to ensure proper drainage.

When plan-profile format is used for intersection details, the profile's horizontal scale must be the same as that for the plan portion. A vertical scale of 1" = 2' for the profile portion is recommended as it enables intermediate elevations to be determined from the profile with reasonable accuracy. The existing ground line and curb line must be as called for in the [CADD Manual](#).

For intersections detailed on a plan only format, show the profile and sections on a separate grid sheet. The standard cross section sheet, available in the FDOT CADD Software, should be used. This sheet features a standard grid of five lines per inch, both in the vertical and horizontal. The vertical scale can be altered to ten lines per inch by utilizing a toggle feature in the FDOT CADD Software.

For street intersections of municipal projects, a scale of 1" = 20' horizontally and 1" = 2' vertically, or 1" = 50' horizontally and 1" = 5' vertically is recommended.

313.2.2 Curb Returns

Curb return profiles show the profiles of the gutter flow line from the PC to the PT point of the return at an intersection.

Show curb return profiles on a grid format. They must be included in the plans set if the required information cannot clearly be shown on the plan-profile sheet or intersection detail sheet, or if extreme grades are involved.

Standard scale used should be 1" = 20' horizontally and 1" = 2' vertically. Other scales may be used provided all construction details are clearly and legibly shown. Identify each return profile and its PC and PT stations shown. Elevations should be shown at appropriate intervals and low and high spots must be identified by location and elevation.

313.2.3 Ramps

Develop ramp profile grades along the baseline of each ramp. A profile of the edge of the pavement opposite the baseline must also be shown. Show these profiles on a grid format. Data required to be shown is similar to that required in **FDM 312** for roadway profile.

Recommended scales for ramp profiles are: 1" = 20' horizontally and 1" = 2' vertically, or 1" = 40' or 50' horizontally and 1" = 4' or 5' vertically.

Sections at nose points are required. They may be shown using a scale of 1" = 20' horizontally and 1" = 2' vertically.

313.2.4 Spline Grade

Intersections of ramp pavement with mainline pavement and other sections of pavement within special superelevated zones need special attention, not only during the design phase of the project, but also during construction. Construction details pertaining to these areas should be clearly and accurately shown in the plans.

Spline grades are often used to show the interconnection and interrelation of the edges of pavement with the mainline edge of pavement. This profile proves to be especially helpful if the mainline pavement is superelevated or within the superelevation transition zone.

A spline grade must show the elevations at intervals of 20 to 100 feet, depending on the scale. Show elevations for the outer edge of mainline pavement and inner and outer edges of the ramp pavement at the nose areas.

Show grades of the three pavement edges on a grid format. Recommended scales are: 1"=20' horizontally, 1"=2' vertically, or 1"= 40' or 50' horizontally and 1"= 4' or 5' vertically.

Join the grades of each pavement edge by smooth splines or simple curves. The three grade profiles must be clearly labeled and all equality stations indicated. Flag and label nose stations. Place the scale in close proximity of the profile and ensure that it is clearly visible.

313.2.5 Superlevation

Standard superlevation details shown in [Standard Plans, Indexes 000-510](#) and [000-511](#) may be used for projects with simple curves. Show a superlevation diagram in the plans for:

- Reverse curves
- Compound curves
- Other conditions requiring special superlevation not covered in the standards

Special profile details may be used to design superlevation on multilane facilities, when a simple diagram will not be sufficient.

Show complete profile grade line and edges of pavement (right and left) within the superlevation zone on the grid format. A scale of 1"= 20' horizontally and 1"= 2' vertically is recommended for clarity. Label the begin and end superlevation stations with a solid vertical line at the appropriate station. Use a horizontal dimension line to indicate a section in full superlevation.

313.2.6 At-Grade Railroad Crossings

In addition to normal profile grade lines, supplemental profiles for at-grade railroad crossings may be necessary to define lane lines, edges of pavement, and gutter flow lines. Develop profiles that ensure proper drainage.

For at-grade railroad crossings that cannot be adequately detailed on the plan-profile sheets, show the profiles on a separate grid format. A horizontal scale of 1" = 20' and a vertical scale of 1" = 2' are recommended.

313.3 Back-of-Sidewalk Profile Sheet

Sidewalk grades shown on this sheet are at the back of the proposed sidewalk. The location of the profile grade line (PGL) is denoted on the typical section.

Prepare Back-of-Sidewalk Profile sheet using standard cross section format. For simple projects which do not involve many cross streets or driveways, the sheet may be divided horizontally to maximize usage. Stationing must progress from left to right and multiple profile views must be stacked from top to bottom. Match lines must be stationed. Care should be taken to preserve clarity and legibility.

Work sheets may be required with phase reviews. The inclusion of the back-of-sidewalk profiles in the plans set is optional (at the discretion of the district).

313.3.1 Required Information

Show existing ground profile, proposed back-of-sidewalk profile, and the profile grade line in accordance with the [CADD Manual](#).

The standard scales are 1" = 100' horizontally and 1" = 5' vertically. This combination works well for projects having few locations where back-of-sidewalk grades would be critical. A vertical scale of 1" = 2' and a horizontal scale of 1" = 50' may be used for projects located in business and commercial areas, or where greater clarity is required. Show elevation datum on both sides of the sheet, with station numbers below the profile.

Limits of existing pavement (e.g., parking areas, driveways) must be identified on the back-of-sidewalk profile. Existing pavement and proposed sidewalk should match elevation as closely as possible. Indicate the centerline for each intersecting street and driveway with a vertical line at the proper station and the street name and station noted. Intersecting streets and driveways on the right must be shown below the profile and those on the left above the profile.

At each station, as well as locations of significant drainage, draw arrows to indicate the slope of ground at the outer edges of the sidewalk.

Place drainage arrows below the profile line for the right profile and above the profile line for the left profile. Arrows pointing outwards from the profile indicate drainage away from the project, while arrows pointing inwards indicate drainage to the project.

Indicate floor elevations for buildings with a horizontal line drawn at the floor elevation between the building limits. Show the numeric elevation, as well as the offset (distance and side) from centerline of project to the face of the building. Entrances to buildings,

elevations of top of existing major utilities (see **FDM 221**), and water table elevation may be shown when appropriate.

Once the proposed back-of-sidewalk profile has been developed, show percents of grade, PI stations, and elevations. Vertical curves, if any, must be dimensioned. Elevations along vertical curves are not required. Flag and label stations for begin and end project, exceptions, back-of-sidewalk special profiles, and mainline station equations within the limits of the sidewalk profile.

Note the difference in elevation between the profile grade line and back-of-sidewalk profile grade on the sheet. Superelevation notes, if applicable, must also be included on the sheet.

314 Intersection and Interchange Layout and Details

314.1 General

These sheets provide layouts and details for intersections and interchanges, with consideration for turning and weaving movements of vehicular traffic. For a safe and efficient roadway system (including provisions for bicycles and pedestrians), these areas must be designed with special attention to channelization, turning movements, signalization, drainage and vertical alignment.

Intersection and interchange layout sheets must show details of geometric controls and access management features including:

- Channelization
- Tapers
- Turn lanes
- Special drainage
- Grading

Prepare the sheets on a standard plan format using a scale large enough to show details clearly and legibly.

314.2 Intersections

These sheets are to be titled:

- (1) Intersection Layout, or
- (2) Intersection Details.

Show intersection details on a separate plan sheet if they cannot be shown clearly on the plan-profile sheet.

In cases of simple, nonsignalized intersections covering relatively small areas, a regular plan-profile sheet may be used. Use an appropriate scale to place the intersection layout in the plan portion and the profile grades in the profile portion.

For larger, more complicated intersections involving channelization, signalization or tapered connections, place the layout on a standard plan sheet. Match lines should be used when more than one sheet is required.

Place the profiles separately on a grid format. Existing topography need not be shown on these details if it is shown elsewhere in the plans. Refer to **FDM 313** for additional information on displaying profiles on grid format.

Information in the plan and profile portions of these sheets typically includes:

- Pavement edges
- R/W lines
- Curb and gutter
- Channelizing and median curbs
- Driveways
- Sidewalks
- Drainage structures
- Pavement dimensions
- Radii
- Appropriate notes

Intersection layouts must be dimensioned, stationed, and include pertinent construction notes and alignment data. Provide design speed data when appropriate. Check widths of turning lanes and turning paths for possible encroachments or conflicts.

Include a north arrow and scale at a point of maximum visibility on the plan sheet. Use a scale that is sufficient to cover all necessary details, preferably 1" = 40'. Do not use a scale smaller than 1" = 50'.

314.3 Interchanges

These sheets are to be titled:

- (1) Interchange Layout,
- (2) Interchange Drainage Map,
- (3) Interchange Topographic Map,
- (4) Interchange Cross Section Pattern,
- (5) Ramp Terminal Details, or
- (6) Ramp Cross Sections.

314.3.1 Geometric Layout

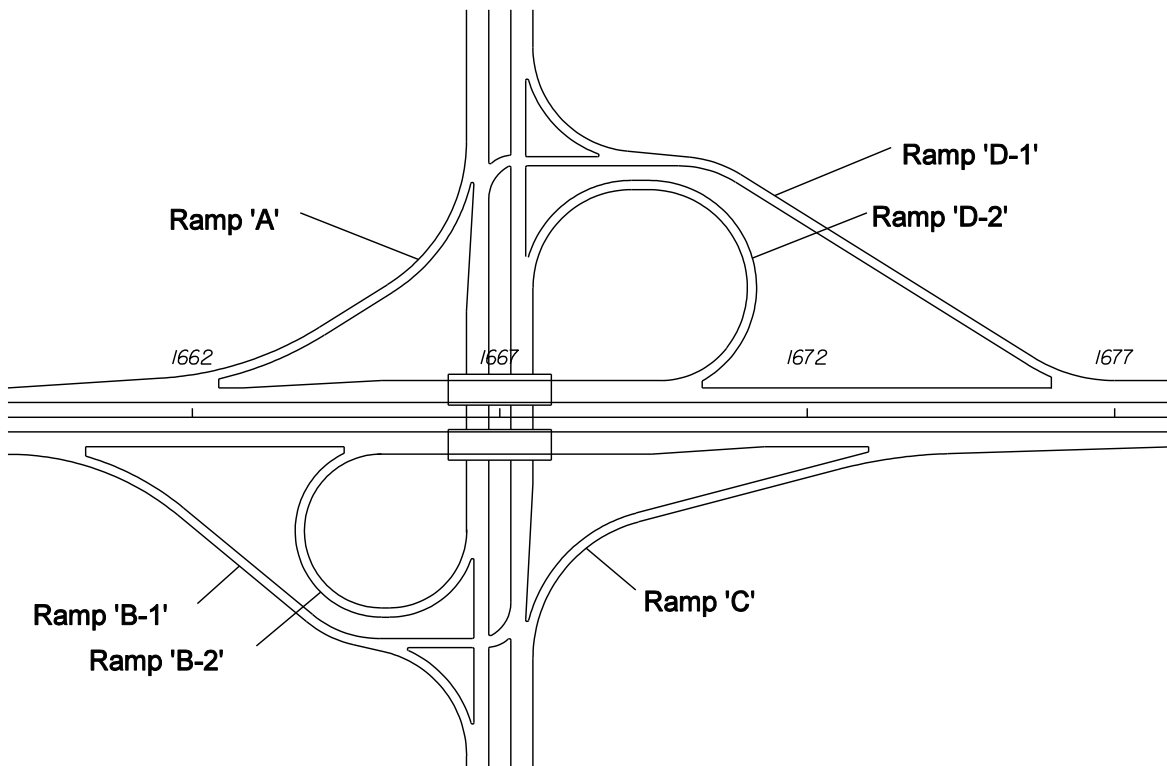
Prepare the Interchange Layout sheet on a standard plan sheet. Place the entire interchange on one sheet when possible, using a scale no smaller than 1" = 400'. In cases of large cloverleaf or directional interchanges, more than one sheet may be required. Show appropriate match lines.

Dimension and station layouts and also include alignment data and construction notes. Assign each curve a number and present curve data in a tabular form. The tabular curve and coordinate data should be placed on the same sheet as the interchange layout.

Identify interchange ramps by the use of letters or a combination of letters and numbers. The recommended practice for assigning ramp names is as follows:

- (1) Ramps in the first left quadrant along mainline stationing should be assigned first. Name assignments progress in a counterclockwise direction around the interchange (see **Figure 314.3.1**). For projects with two or more interchanges, continue name assignments with the next letter and in same counterclockwise direction noted above.
- (2) Ramp baselines are typically located on the right edge of the pavement with respect to the direction of traffic, and must be clearly indicated. Stationing of ramps should be in the same direction as the project.

Figure 314.3.1 Interchange Layout



A topographic worksheet for all interchanges is required and will be considered as the preliminary layout of the interchange. Prepare this worksheet on a standard plan sheet using a scale no smaller than 1" = 400'. Include the following information on the worksheet:

- (1) All topography, such as existing roads, property lines, utilities, buildings, driveways.
- (2) Preliminary interchange geometrics and proposed R/W limits.
- (3) Drainage R/W and easements.
- (4) Proposed reconstruction of the crossroad, and access roads and frontage roads within the interchange.
- (5) Frontage roads should be assigned a unique alpha or numeric designation to avoid confusion with ramp nomenclature.
- (6) Contours, unless the terrain is relatively flat.
- (7) Traffic diagram with AADT, DHV, K, D and T values.
- (8) The length of speed change lanes.

- (9) Design speed for ramps and crossroads.
- (10) Proposed bridge limits.
- (11) Pavement transitions.
- (12) Limits of construction along the crossroad.

314.3.2 Ramp Terminal Details

Show details of ramp terminals with mainline and crossroads on separate plan sheets. Do not use a scale smaller than 1" = 50'. A scale of 1" = 40' is preferred. Show the following details of the terminal:

- (1) Curve data.
- (2) Station equality and horizontal tie to mainline or crossroad at critical ramp locations.
- (3) Turning radii, taper/transition lengths, curb/curb and gutter (if any).
- (4) Channelization (if any).
- (5) Ramp and crossroad intersection station and angle.
- (6) Median nose data (if any).
- (7) Limits of construction.
- (8) R/W.
- (9) Limited Access R/W and fence location.
- (10) Drainage structures.
- (11) Spot elevations (as needed).
- (12) Roadway dimensions.
- (13) Station pluses and offsets.

314.3.3 Cross Section Pattern Sheet

The Cross Section Pattern sheet shows the entire interchange layout (including frontage and access roads, if any) with location and extent of proposed cross sections. Include the following information on the Cross Section Pattern sheet:

- (1) North arrow and scale.
- (2) Interchange layout.
- (3) Access and frontage roads (if any).
- (4) Centerline construction and baseline survey.
- (5) Ramp base lines.
- (6) Stationing along mainline, crossroads, ramps, access and frontage roads.
- (7) PC and PT points by symbol.
- (8) Bridge outline.
- (9) Cross section pattern.

Prepare the Cross Section Pattern sheet on a standard plan sheet. Use a scale such that the complete interchange is clearly and legibly shown on one plan sheet. A scale of 1" = 400' is preferred. Place the north arrow and scale at a point of maximum visibility.

315 Drainage Structures

315.1 General

Drainage Structure sheets show the following information:

- Drainage structures and their location
- Cross section
- Flow line elevations
- Top of grates
- Culverts and top of manhole elevations
- Vertical relationships of the entire drainage system

All projects require the plotting of drainage structures. When only cross drains are to be constructed or modified, drainage structures may be plotted on the cross section sheets. Otherwise, drainage structures should be plotted on separate drainage structure sheets, utilizing the cross section sheet cell available in the FDOT CADD Software. See **FDM 324** for additional requirements for box and three-sided culverts utilized as drainage structures. Examples of Drainage Structures sheets are included in **Exhibits 315-1** through **315-5**.

315.2 Required Information

For flush shoulder projects, show the existing ground line at the location of the structure, with the existing elevation placed immediately below the ground line at the survey baseline. Do not show existing structures, except those to be incorporated into the proposed drainage system or otherwise modified. Note the flow line elevations of the drainage structures shown in the plans. Where storm drains run laterally or diagonally across the project, the drawing should show the pipe cover.

Show the roadway template and proposed structures, with the proposed profile grade elevation, placed above the grade point. Locate the structure by station and offset from the centerline of construction. Provide flow line information at each structure and at each culvert end. Plot drainage structure details according to the applicable index of the [Standard Plans](#) Index; e.g., show walls, grates, tops, pipes.

Include the size and length of each proposed structure on the cross drain sections. Show box and three-sided culvert lengths on the drainage structure sheet.

Depict sections for skewed cross drains along the centerline of the structure. Clear zone distances are to be measured at right angles to the traffic lane for all structures.

Determine where the construction of a drainage structure may have potential impact on existing R/W.

Note the following information for each drainage structure:

- Size
- End treatment
- Flow line elevations
- Structure number
- Standard Plan
- Station number
- Flow direction arrows

Place the note as close to the structure as possible. Provide elevations for manhole tops, and ditch bottom inlet grates and slots. Show grate elevations for gutter inlets and edge of pavement elevations for curb and gutter inlets.

Include special grate treatment requirements in the inlet note. Include additional details; e.g., special bedding, 36" manhole rings.

Show material options on the Optional Materials Tabulation Sheet (see **Exhibits 308-1** and **308-2** in **FDM 308**).

Modification for Non-Conventional Projects:

Delete sentence above and see Chapter 6 of the [Drainage Manual](#) for Optional Material documentation requirements.

If existing structures are to be filled and plugged and are to remain in place, show them in the plans with an appropriate note.

Include the following notes on the first drainage structure sheet as applicable:

- (1) Special attention is directed to the fact that portions of some drainage structures extend into the stabilized portion of the roadbed and extreme caution will be necessary in stabilization operations at these locations.
- (2) All drainage pipes have optional materials. The Optional Materials Tabulation Sheet(s) shows all materials allowed and indicates which material is plotted in the plans and used as the basis for pay quantities.

315.3 Utility Conflicts

Identify and resolve drainage structure conflicts with existing or proposed utilities as early in the design process as possible. Plot utilities, as defined in **FDM 221**, in conjunction with the structures to identify potential conflicts.

Plot a section for each location that a longitudinal pipe crosses a major underground utility line.

Note and plot (to scale) the utilities that have been verified (Quality Level "A" locate) in the appropriate locations on the Drainage Structure Sheets, Cross Section Sheets and bridge foundation plans. These utilities should be labeled with the following symbol:

V_{vh1} = Verified Vertical Elevation and Horizontal Location and pipe ID number

315.4 Sheet Setup

Plot drainage structures as sections along the centerline of the structure and show on a standard cross section sheet. Space the sections sufficiently to avoid overlapping of structures or notes. Label the station and offsets from the appropriate baseline or centerline, as indicated in the [Standard Plans](#). Beginning at the bottom of the sheet, show the sections successively by stations and number them sequentially, from the beginning to the end of the project. Show the structure number and location station near the right border of the sheet.

If a structure must be shown out of order, place a note in the correct sequence, referring to the sheet where the structure is shown. Use the same scale that is used for roadway cross sections, with the centerline of construction placed near the center of the sheet.

Exhibit 315-1: Drainage Structures

Exhibit 315-2: Drainage Structures

Exhibit 315-3: Drainage Structures

Exhibit 315-4: Drainage Structures

Exhibit 315-5: Drainage Structures

316 Stormwater Facilities

316.1 General

This chapter discusses the content and requirements for plan sheets relating to stormwater facilities, including the following systems:

- lateral ditches
- outfalls
- retention areas
- detention areas
- mitigation areas

These systems typically require additional R/W or easements.

Mitigation areas are not usually a component of the highway drainage system. However, they may include drainage components.

Drainage components adjacent to the roadway may be shown on the roadway plan-profile sheets as long as they are clear and legible. Drainage components not adjacent to the roadway may require separate plan view sheets. In either case, profile views and cross sections may also be needed.

Plans for drainage components are typically grouped into three categories:

- (1) Lateral ditches and outfalls
- (2) Retention or detention areas
- (3) Mitigation areas

316.2 Lateral Ditches and Outfalls

Prepare lateral ditch plans and profiles on a standard plan-profile sheet using a horizontal scale of 1" = 100'. However, if storm drain construction is proposed for a portion of the ditch, a scale of 1" = 40' or 1" = 50' may be used.

316.2.1 Plan Portion

Orient data in the plan portion so that the lateral ditch or outfall centerline is parallel to the long side of the sheet. Show information in a manner similar to that described in **FDM 312**.

Show R/W (or easement) alignment data and topography in the plan portion. Tie the alignment of the lateral ditch or outfall to the centerline of construction. Place the north arrow and scale at a point of maximum visibility, typically in the upper right portion of the plan view.

316.2.2 Profile Portion

Prepare the profile portion in the same manner as described in **FDM 312**. Show the following information:

- Existing ground line profiles
- High water elevations
- Underground utilities
- Benchmark information
- Elevation datum

Where the lateral ditch and outfall survey baselines do not follow the flow line of the existing ditch or channel, the existing ditch or channel profile must be shown with a broken line and identified.

If storm drain construction is proposed along a lateral ditch or at an outfall, plot the proposed structures on the drainage structures sheets, or in the lateral ditch and outfall profile. Include the following information for the structures shown in the profile:

- Flow line
- Structure numbers
- Pipe or culvert sizes
- Utilities (if applicable)
- Label the normal water elevation of the receiving system.

316.2.3 Typical Section

Include a typical section showing the following:

- Limits of clearing and grubbing
- R/W
- Ditch bottom width
- Side slopes

The typical section does not need to be to scale, but must be dimensionally proportionate. If the width of proposed clearing and grubbing is variable, note the various widths and their respective station limits below the typical section.

316.2.4 Ditch Cross Sections

Lateral ditch cross section sheets are included in the plans. These sheets include the following:

- R/W
- Earthwork
- Limits of clearing and grubbing

Prepare lateral ditch cross sections in the same manner as described in **FDM 319**. A horizontal scale of 1" = 10' is preferred. Use a vertical scale of 1" = 10'.

Two or more columns of ditch cross sections may be placed on one sheet. Cross section stationing must progress from the bottom to the top of the sheet and multiple columns must be placed from the left to right.

Soil surveys are typically performed along the lateral ditch only when a large amount of material is expected to be excavated.

316.3 Retention or Detention Areas

316.3.1 Pond Detail Sheet

The retention or detention pond, including the outlet structure, is usually the end point of the drainage system for a particular project. The retention or detention pond detail sheet shows the pond in plan view and includes station and offset ties to the project centerline of construction. The plan view also includes the following:

- (1) Locations of pond sections
- (2) Side slopes and base dimensions
- (3) Bottom and top elevations
- (4) Location of maintenance berm
- (5) Fence and gate locations
- (6) R/W
- (7) Pond drainage structures with structure numbers
- (8) Soil boring locations
- (9) Any other necessary data pertaining to the pond

Include a minimum of two sections, taken in directions perpendicular to each other. These pond sections include the following:

- Bottom width and elevation
- Side slopes
- Normal water depth (if applicable)
- Soil borings

316.3.2 Typical Section

A typical section is required when the pond sections do not represent the *typical* design features of the pond. The following is a list of appropriate information to be shown on the typical section:

- Limits of clearing and grubbing
- Side slopes
- Bottom and top elevations
- Details of maintenance berm
- Fence location
- R/W
- Water level information
- Vegetation requirements

The typical section does not need to be to scale, but must be dimensionally proportionate. It should be shown on the pond detail sheet, if room allows, or on a separate sheet when necessary.

316.3.3 Pond Cross Sections

Prepare pond cross sections in the same manner as described in **FDM 319**. A horizontal scale of 1" = 10' is preferred. Use a vertical scale of 1" = 10'.

If material is to be excavated from the pond, plot the soil borings on the cross sections.

316.4 Mitigation Areas

If construction details for mitigation areas are included in the plans, follow the requirements for retention or detention areas.

317 Special Details

317.1 General

Special Details sheets are included in the plans set when additional details, information or clarification to specific construction elements is necessary. These sheets are typically included when Roadway Plan sheets do not provide the scale necessary to clearly depict the work that is required. Special Details Sheets are also used to show construction details that are not provided in the [Standard Plans](#).

These sheets are to be placed in the component plans in accordance with **FDM 302.6**.

317.2 Sheet Setup

Use the standard plan format sheet provided in the FDOT CADD Software to prepare the sheet. Use standard symbols contained in the FDOT [CADD Manual](#).

Any convenient scale may be used, provided the information shown is clear and legible. Provide adequate cross-referencing to appropriate sheets in the plans set.

318 Soil Survey

318.1 General

The Soil Survey sheet (essentially a soil test analysis sheet) depicts the various types of soils encountered within the limits of the project. This sheet also shows the classification, mechanical properties and recommended usage of those soils. A preformatted CADD sheet can be found in the FDOT CADD Software.

Assign soils having identical characteristics to the same stratum and group for identification and recommendation purposes. The test analysis sheet must be signed by the responsible Engineer.

318.2 Roadway Soil Survey Compilation and Presentation

Upon completion of the proposed typical section, and after placing alignment, proposed grades and existing utilities on the plan-profile sheets and preliminary sections, prints of these sheets must be utilized for determining the location and depth of borings for the sampling of soils for testing and classifications. These classification and test results, including pH, resistivity, sulfides, and chlorides must be shown on the test analysis sheet. Show date and weather conditions at the time of sampling. Refer to **Exhibit 318-1** for an example of Soil Survey sheet.

After completion of soils testing, show the boring data on cross sections by columns approximately 1/4 inch wide below the ground line at test sample locations. Show stratum limits and numbers inside the column. Transmit this information to the appropriate responsible materials engineer for verification. Retain one hard copy of the soils information, including cross sections with soils information, in the Soils Engineer's Record.

318.3 Other Soil Surveys

Soil surveys other than those for roadway plans are required for various plans components. Included in these are soil surveys/borings for retention/detention ponds, overhead sign structures, high mast poles and traffic signal mast arms.

Soil Survey sheets generated for such components are generally located in the plans set with the other details and information for each component. Requirements for the Soil Survey sheets are similar to those prepared for the roadway soil survey, showing such things as the location of test holes, various strata encountered, soil properties, classification and recommended usage.

Exhibit 318-1: Roadway Soil Survey

319 Cross Sections

319.1 General

Cross sections depict the existing ground conditions, including all manmade features, as sections perpendicular to the respective stations along a survey baseline or construction centerline. The proposed cross-sectional outline of the new facility with all its functional elements is also shown on cross sections. See **FDM 111.3.1** for three-dimensional (3D) models.

Use standard cross section sheets for showing roadway cross sections. The preformatted sheet cell is located in the FDOT CADD Software. The recommended vertical scale is 1" = 10'. The horizontal scale should be such that the entire roadway R/W is shown on the sheet (generally 1" = 10' or 1" = 20'), but not smaller than 1" = 40' horizontal. If the entire R/W cannot be shown on one sheet, more sheets may be utilized and appropriate match lines shown with referenced sheet numbers. Show the scale at the bottom right corner of the sheet above the title box.

319.2 Required Information

Show existing ground lines and note the existing elevation at the centerline just below the ground line at the centerline. Indicate the station number of the section below the ground line on the right side of the sheet. Label the baseline of survey along the top and bottom of the sheet. Lines parallel to the baseline of survey should show station equivalencies to the baseline of survey.

Show the surface, as well as the below ground portions of existing features such as pavements, curbs, and sidewalks.

Existing parallel underground utilities which lie within the horizontal limits of the project must be shown along with verification notation for those locations which have been verified. Utilities that have been verified should be labeled as shown in **FDM 315**. Small distribution or service lines need not be drafted.

Show the soil data and the groundwater table elevation from soil borings on cross sections as described in **FDM 318**. If it is determined that an organic or plastic material must be removed below the finished grade template, show the lower limits (undercut line) of the removal on the cross section to determine the area and volume of subsoil excavation. Refer to **FDM 216** and [Standard Plans, Index 120-002](#) for the requirements of subsoil excavation; i.e., removal of unsuitable organic or plastic soils.

Show the proposed roadway template. The proposed profile grade elevation must be placed vertically or at an angle to the horizontal, just above the profile grade line. Special ditch elevations must also be shown.

Show station equations, even though a cross section may not be plotted at that point. Show equivalent mainline stations for ramp cross sections. The R/W limits must be symbolically shown for each cross section.

The begin and end stations for project, construction, exceptions, bridge/bridge culvert, and the toe of slope under the bridge must be shown on the right edge of the sheets near the earthwork columns. Show the beginning and ending earthwork stations.

Show earthwork summaries in the Summary of Earthwork portion of the Estimated Quantities Report. See **FDM 902** for guidance.

The order of assembling the cross sections in the plans set must be:

- (1) Mainline
- (2) Side streets
- (3) Ramps

319.3 Sheet Set Up

Show cross sections on a standard preformatted cross section sheet (available in the FDOT CADD Software) with stations increasing from the bottom to the top of the sheet. Typically, only one column of sections is placed on a sheet.

The interval selected for showing sections on the cross section sheet will vary according to project specific factors. For new construction and reconstruction, the normal interval for cross sections is 100 feet for flush shoulder roadways and 50 feet for curbed roadways. These intervals may also be appropriate on RRR projects, depending on the variability of earthwork along the project. Other factors that may influence the frequency of cross sections include the presence of intersections, extent of driveway and turnout construction or reconstruction, ADA related work, and drainage improvements.

Center sections on the sheet with the survey baseline or the construction centerline placed vertically in the center. In cases where additional lanes are to be constructed adjacent to existing lanes, centering the sections will depend upon the location of the survey line and the side on which the new construction is to be placed. Orient sections such that the complete ultimate section will be approximately centered on the sheet. When the centerlines of construction and survey are not parallel, the distance between the two at each cross section must be shown.

Place as many sections as possible on a sheet with sections being spaced to avoid overlapping. The soil profile should be checked for possible unsuitable material below existing ground which may cause overlapping of sections.

When R/W is narrow enough and a horizontal scale of 1" = 20' is used, two columns of cross sections may be placed on a sheet. Cross section stationing must progress from the bottom to the top of the sheet and multiple columns must be placed from the left to the right. Set up the sheet to provide earthwork columns for each column of sections.

See **FDM 216** for additional information on showing earthwork data on Cross Sections sheets.

320 Stormwater Pollution Prevention Plan (SWPPP)

Modification for Non-Conventional Projects:

Delete **FDM 320** and see RFP for requirements.

320.1 General

The Stormwater Pollution Prevention Plan (SWPPP) sheets document the designer's site evaluation and selection of control measures and other items to comply with the terms and conditions of the State of Florida Department of Environmental Protection (DEP) Generic Permit for Stormwater Discharges from Large and Small Construction Activities (DEP Generic Permit) discussed in **FDM 251**.

For an example of SWPPP sheets on a major reconstruction project, see **Exhibit 320-1**. Additional guidance for developing a SWPPP may be found in the DEP SWPPP template, found on the DEP web page at:

<http://www.dep.state.fl.us/water/stormwater/npdes/swppp.htm>

320.2 Narrative Description

The SWPPP sheets include a narrative that refers to other documents such as the [Standard Specifications](#) or the [Standard Plans](#) as necessary. Use the following outline to prepare the narrative:

- (1) Site Description
 - (a) A Description of the Construction Activity
 - (b) Sequence of Major Soil Disturbing Activities
 - (c) Area Estimates (The total project area and the area expected to be disturbed.)
 - (d) Runoff Data consisting of:
 - i. Rational runoff coefficient before, during, and after construction,
 - ii. The size of the drainage area for each outfall,
 - iii. The location of each outfall, in terms of latitude and longitude (to the nearest 15 seconds),
 - iv. Existing data describing the soil or the quality of discharge from the site

- (e) Site Map (Include a narrative as described in **FDM 320.3**)
 - (f) Receiving Waters (The name of the receiving waters for each outfall and the wetland area on the site.)
- (2) Controls
- (a) Erosion and Sediment Controls
 - i. Stabilization Practices
 - ii. Structural Practices
 - (b) Stormwater Management
 - (c) Other Controls
 - i. Waste Disposal
 - ii. Off-Site Vehicle Tracking & Generation of Dust
 - iii. State or Local Regulations
 - iv. Application of Fertilizers and Pesticides
 - v. Toxic Substances
 - (d) State and Local Plans
- (3) Maintenance
- (4) Inspection
- (5) Non-Stormwater Discharges

The sheets may also include supplemental design details and plan views of the location of the controls. Additional information for preparing the SWPPP sheets can be found in the [**State of Florida Erosion and Sediment Control Designer and Reviewer Manual**](#).

320.3 Site Map

Show the following information on a site map:

- (1) Drainage patterns
- (2) Approximate slopes
- (3) Areas of soil disturbance
- (4) Areas that are not to be disturbed
- (5) Locations of controls identified in the plan
- (6) Areas that are to be stabilized against erosion
- (7) Surface waters (including wetlands)
- (8) Locations where stormwater is discharged to a surface water

The above information is typically shown on other sheets within a set of construction plans. Prepare a narrative description of the site map which identifies the construction plan sheets where the site map information required by the DEP Generic Permit can be found.

The locations of the temporary controls may be shown on SWPPP sheets, Erosion Control sheets, Plan-Profile sheets, or Temporary Traffic Control (TTC) Plan sheets. For projects where plan view sheets are not available, summarize the locations of the controls in a tabular format.

If an optional Drainage Map is included in the construction plans, then the drainage patterns will be shown on it. If the Drainage Map is not included, prepare a topographic map (for example, a USGS quadrangle map) showing contour lines. This map will supplement the construction plan sheets that show the other site map requirements. The supplemental site map may use photography (aerial or other). Include this supplemental map in the SWPPP sheets.

320.4 Controls

The SWPPP must include a description of the controls that will be implemented at the construction site. For each of the major activities identified in **Part 1.b** of the **Narrative**, describe the timing of the implementation of control measures during the construction process. Also describe the stormwater management measures that will be installed during construction to control pollutants in the stormwater discharges that will occur after construction.

Details should be prepared for all controls that are not detailed in the [State of Florida Erosion and Sediment Control Designer and Reviewer Manual](#). The details should show the work intended, where and how the control is to be placed, and any other special design details. Any Technical Special Provisions required by the erosion control items of work should be prepared for the specification package.

The narrative for some of the other controls will be supplied by the contractor at the preconstruction conference. A plan for off-site vehicle tracking is an exception and must be included in the SWPPP prepared during design.

Any Water Management District or Local Water Management District permits obtained in connection with the project should be noted.

320.5 Maintenance, Inspection and Non-Stormwater Discharges

Include a description of any maintenance requirements that are not stated in the standard specifications. Include the inspection requirements, which will be either requirements of the DEP or the applicable requirements of another regulatory agency, whichever is more stringent. If special procedures have been developed to minimize turbidity associated with normal construction dewatering, include a description of those procedures.

Special monitoring requirements described in the DEP Generic Permit may apply where the project discharges to waters listed in **Section 303(d)** of the **Clean Water Act**. Consult with the district environmental permitting staff to determine if the monitoring requirements apply. If applicable, describe the special monitoring requirements in the inspection section of the narrative.

321 Temporary Traffic Control Plan

321.1 General

A project-specific Temporary Traffic Control Plan (TTCP) is required for all projects. The TTCP is used to describe the actions to be taken by the Contractor to minimize traffic impacts while conveying traffic through a work zone. The TTCP may include the following:

- General Notes
- Phasing Notes
- Phasing Typical Sections
- Phasing Plan-Profile Sheets
- Signalization Plans
- Special Details
- Temporary Cross Sections
- Temporary Highway Lighting Plans

321.2 TTCP Submittals

TTCP submittals typically include the following:

- (1) **Phase I:** a typical section for each phase as well as a description of the phasing sequence and work involved.
- (2) **Phase II:** a majority of the TTCP completed (75-90%) and a list of the pay items needed.
- (3) **Phase III:** a final TTCP, including all notes, pay items and preliminary quantities. The construction office estimates the duration for each phase of construction during Phase III review.
- (4) **Phase IV:** finalize the quantities in the plans and Designer Interface.

Modification for Non-Conventional Projects:

Delete **FDM 321.2** and replace with the following:

321.2 TTCP Phase Submittals

TTCP phase submittals include the following:

- (1) **Technical Proposal:** a typical section for each phase as well as a description of the phasing sequence and work involved.
- (2) **90% Component Plans Submittal:** a majority of the TTCP completed.
- (3) **Final Plans:** a final TTCP, including all notes.

321.3 Required Information

The information provided in the TTCP may be simple or may be elaborate (e.g., detailed individual phase layouts using profile sheets, interchange, and intersection layout sheets).

Provide the following information in the TTCP:

- Work zone speed
- Lane widths and shoulder widths

- Lane closure restrictions
- Traffic pacing restrictions
- PCMS message for each phase
- Temporary geometry for all road users (e.g., all necessary special details or phasing plans to provide a pedestrian detour or temporary pedestrian way)
- Locations or notes describing locations of temporary traffic control devices
- Temporary drainage design or permanent drainage design phasing
- Signal timing for each phase, including temporary actuation, to maintain all existing actuated or traffic responsive mode signal operations for main and side street movements for the duration of the Contract (coordinate with District Traffic Operations Engineer)
- Work, by location, to be accomplished during each phase of construction
- Project-specific requirements (e.g., school zones, railroads, waterborne vessels)

321.4 Levels of Complexity

The following guidelines have been developed to assist in determining the level of detail and complexity that may be required for a project.

321.4.1 Level I

Project Type: Simple construction projects

Examples: RRR, Minor Widening

Components of the TTCP

- (1) General Notes
- (2) Phase Typical Section(s)
- (3) Minimal Special Details
- (4) Pedestrian Special Details or Phasing Plans

321.4.2 Level II

Project Type: Complex construction projects

Examples: Widening Projects, Projects with Diversions

Components of the TTCP

- (1) General Notes
- (2) Phase Notes
- (3) Phase Typical Section(s)
- (4) Detailed Plan Sheets
- (5) Cross Sections, as necessary (e.g., diversions, temporary drainage, temporary bridge structure)
- (6) Temporary Signalization Plans, as necessary
- (7) Special Details, as necessary (e.g., temporary drainage, slope requirements due to diversions, temporary signalization, railroad work)
- (8) Pedestrian Special Details or Phasing Plans

321.5 Format

Prepare TTCP on a standard plan sheet. A scaled drawing is not always required; however, clarity and legibility are critical. When scaled drawings are required, the scale must not be less than 1" = 100' for plan sheets and 1" = 40' for special details. Use levels, fonts, and line weights in accordance with the [CADD Manual](#).

Tools are available in FDOT CADD Software to assist in the development of TTCPs.

322 Utility Adjustments

322.1 General

The Utility Adjustments sheets provide coordination between the contractor and the affected utility companies. These sheets show the approximate locations of existing, proposed and relocated utilities, which helps to identify potential conflicts or damage to utilities. Projects with minor utility work or impacts may include these features on the roadway plan or plan-profile sheets or appropriate component plan sheets.

322.2 Required Information

Show locations of existing and proposed utilities within the project limits.

Clearly show and label all proposed and relocated utilities on the plans using lines and standard utility symbols (see the [CADD Manual](#)). Clearly indicate the disposition of existing utilities that are not to remain in place and in service (e.g., "To Be Removed", "To Be Adjusted", "To Be Relocated"). Clearly label the disposition of existing utilities that are to remain in place and in service label with only the Utility Agency Owner (UAO), Type, Size, and Material. and in service need not be labeled.

Show the line voltage for all overhead electrical power lines.

Place the following notes on the first Utility Adjustment sheet. Include these notes in the General Notes (see **Exhibit 311-1** in **FDM 311**) if there are no utility adjustment sheets in the plans:

- (1) The location(s) of the utilities shown in the plans (including those designated V_v , V_h and V_{vh}) are based on limited investigation techniques and should be considered approximate only. The verified locations/elevations apply only at the points shown. Interpolations between these points have not been verified.
- (2) Utility/Agency Owners:

Company	Contact	Telephone Number
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The provided company names and phone numbers are for emergency utility contacts. Also include the contact information for persons responsible for the maintenance of FDOT utility infrastructure such as traffic counters, lighting, signal components, and ITS.

Include the ~~Transportation Statistics~~[Trafficansportation Data and Analytics](#) Office in Tallahassee in the list of Utility/Agency Owners if there is a traffic-monitoring site on the project or within one-half mile of the construction. The contact person is the Traffic Data Section Manager. Refer to **FDM 312.2.6, Item No. 13** for plan requirements involving traffic-monitoring sites.

While not utilities, the Department-owned subsurface communication lines must be clearly shown and labeled on the plans. See **FDM 328.1** for additional information.

322.3 Sheet Format

Prepare the utility adjustment sheets from CADD files generated for the plan or plan-profile sheets, and only the plan portion should be shown. Use levels, fonts and line weights in accordance with the [CADD Manual](#).

Information and graphic data that is not necessary for utility adjustment sheets may be removed by turning off the appropriate level(s) on which the data is stored. This will help ensure that information pertinent to utility adjustments is more easily seen. Show the following information on the utility adjustment sheets as a minimum:

- (1) Baseline and/or centerline of survey.
- (2) Curb and gutter or edge of pavement.
- (3) Drainage structures (existing and proposed).
- (4) Right of way lines.
- (5) Station numbers.
- (6) Street names.
- (7) Location of existing utilities. Label all major utilities that have been field verified (see *Quality Level "A" locates*, **FDM 221**) in accordance with the following symbol:

V_{vh} = Verified Vertical Elevation and Horizontal Location

At the District's option, a table of field-verified utilities containing the following information can replace the profile view on each sheet:

V _{vh} No.	Utility Description (Owner, Type)	Size	Material	B/L or C/L			Existing Ground Elevation	Top Elevation	Comments
				Station	Offset	Lt./Rt.			

- (8) Disposition of existing utilities that are not to remain in place and in service.
- (9) Location of new or relocated utilities.

323 Selective Clearing and Grubbing Plans

323.1 General

Selective Clearing and Grubbing Plan sheets are developed when existing vegetation, trees, and palms are to be protected, relocated, pruned, or removed as an alternative to Standard Clearing and Grubbing. **FDM 229** contains design criteria to determine the type and the limits of selective clearing and grubbing.

Place Selective Clearing and Grubbing Plan sheets in accordance with **FDM 302**.

323.2 Selective Clearing and Grubbing Plan Sheet

Selective Clearing and Grubbing Plan sheets include the following information, as applicable:

- Extent and type of type of clearing operation required within the project R/W limits
- Root pruning and branch pruning
- Plant preservation areas
- Tree protection barriers

For an example of a Selective Clearing and Grubbing Plan sheet, see **Exhibit 323-1**.

323.2.1 Sheet Set Up

Use the standard plan format sheet provided in the FDOT CADD Software to prepare Selective Clearing and Grubbing Plan sheets. Refer to the [CADD Manual](#) for CADD standards associated with selective clearing and grubbing.

Show existing topography and the centerline of construction with stationing, proposed edge of roadway pavement, R/W lines, limits of construction, canopy of existing trees, limits of vegetation to remain, tree protection barrier, and trees to be relocated. Include a legend on each sheet depicting the type of selective clearing and grubbing operation to be performed.

Place a north arrow and scale in a conspicuous location, typically in the upper right portion of the sheet. Use a scale that provides clarity and legibility. Use appropriate match lines when necessary.

When tree canopies overlap, the entire outline of the tree canopies can be shown as one mass. Show tree protection barrier on the plans. Branch and root pruning locations. When existing trees to remain are to be root pruned, the trees are assigned a label which should also be summarized, (per tree), in a summary box and shown as pruned on the Tree Disposition Charts. These items may also be labeled on the plans when needed for clarity or called out in the Selective Clearing & Grubbing Work Table, but must be quantified per tree. Each tree does not need to be labeled when a group of trees are to be branch pruned, but the quantity of trees to be pruned must be provided. The disposition of trees to be relocated is shown on Tree Disposition sheets. For an example of a Tree Disposition Sheet and a Tree Disposition Chart, see **Exhibit 323-3** and **323-4**.

Where clarification is needed, trees to be removed may be noted on the plan.

Generally, the line between where standard clearing and grubbing occurs and where trees to be protected, relocated, or selectively removed demarcates a selective clearing and grubbing area. Selective clearing and grubbing areas are not always demarcated by a means of vegetation treatment or protection (tree protection barrier). Areas of tree protection, plant preservation, or selective clearing and grubbing may be delineated with tree protection barriers. When a tree protection area is adjacent to a R/W fence to remain, a sediment barrier, or similar permanent barrier, the tree protection barrier that is parallel to the permanent barrier may be omitted.

323.3 Selective Clearing and Grubbing Detail Sheet

The notes required for selective clearing and grubbing vary depending on the project. It may be desirable to provide a separate Selective Clearing and Grubbing Detail Sheet to display the notes, symbols, and details that are applicable to the project. For an example of a Selective Clearing and Grubbing Detail Sheet, see **Exhibit 323-2**.

323.3.1 Work Table

For an illustration of a Selective Clearing and Grubbing Work Table, see **Exhibit 323-2**.

Selective clearing and grubbing areas are defined and labeled by location. Location numbers can be based on roadway stationing numbers, quadrants, or sheet numbers.

Provide a Selective Clearing and Grubbing Work Table when the project includes selective removal of vegetation. As a minimum, the table includes:

- (1) Abbreviated name of primary species to preserve
- (2) Abbreviated name of primary species targeted for removal

(3) Work Description

Other information that may be included in the table:

- (1) Florida Exotic Pest Plant Council Category I species to be removed
- (2) Estimated percent of Category I vegetative cover for each area
- (3) Additional species to target for removal or preservation
- (4) Root and branch pruning and intent (structural, aesthetic, safety, etc.)
- (5) Tree stumps to be removed or to remain
- (6) Additional Information

323.3.2 Species Legend and Work Table Notes

Include a species legend with the Selective Clearing and Grubbing Work Table. The legend is to show all plant species noted in the table. Plant species are typically abbreviated by the first letter of the genus and the first letter of the species of the botanical name; e.g., show Live Oak, *Quercus virginiana* as QV.

Category 1 plants (as listed by the [Florida Exotic Pest Plant Council](#)) are undesirable, and in most cases should be listed to be removed. The designer may call out Category 1 plants that are to remain in the Work Table Notes or in the Selective Clearing and Grubbing Work Table, in cases where it may not be practical or feasible to remove them. Undesirable native species to be targeted for removal can also be listed.

Provide the following note on the Selective Clearing and Grubbing Detail sheet:

“Primary” species to target (remove) or preserve are those that were determined to be most prevalent in that area and are not intended to be the only species that occur.

Provide a note describing follow up treatment needed to prevent recurrence of removed plants.

323.4 Tree Disposition Sheets

Tree Disposition Sheets are used when there are trees to be relocated or an inventory of existing trees is necessary. An inventory may be necessary in order to document the species and size, in the case of damage or removal during construction. The inventory will provide a record of what existed, prior to the damage or removal, if mitigation or

replacement is warranted. For an example of a Tree Disposition Sheet, see **Exhibit 323-3**.

Tree Disposition Sheets may be omitted if required information and tree relocations can be clearly and legibly shown on Selective Clearing and Grubbing or Landscape Plan sheets. If a tree or vegetation survey is available, utilize either Selective Clearing and Grubbing, Landscape or Tree Disposition sheets, showing all information on one sheet type on the Tree Disposition Chart. If there is no tree or vegetation survey, utilize only Selective Clearing and Grubbing or Landscape Sheets to show all information.

Note the following in the plans:

- Proper root pruning methods and time schedule for each species of plant to be relocated. See **FDM 323.6** for more information.
- Contractor is responsible for coordination with an arborist for the care of vegetation during construction and during root and branch pruning

Tree bracing that is not covered by **Standard Plans, Index 580-001** is to be detailed in the plans. Refer to **FDM 329.7** to determine when **Standard Plans, Index 580-001** applies. Provide recommended root pruning procedures and time schedule. Provide the above information as plan notes or details to the sheet.

Tree Disposition Sheets show the condition of each tree, and whether each tree is to remain, to be removed, or to be relocated. Tree Disposition Sheets and Tree Disposition Charts (see **FDM 323.5**) list the trees on a site, and the tree numbers which must correspond to the tag ID numbers. Groups of trees to remain may be shown as a single cluster and assigned one representative tree number. Include the representative tree number on the Tree Disposition Chart and noted as 'Group of Trees' in the notes column. Show limits of clear sight and horizontal offset on the Tree Disposition Sheet for the location of relocated material. Only show this information on the Tree Disposition Sheet if it is not shown elsewhere in the plan set, such as on the Landscape Plan.

Tree Disposition Sheets are typically prepared as part of the Selective Clearing and Grubbing Plan Sheets in the Roadway Plans set. When prepared as part of a Landscape plan set, place the sheets prior to the Landscape Plan sheets.

323.5 Tree Disposition Chart

A plan sheet titled "Tree Disposition Chart" should accompany the Tree Disposition Sheets, and include the following in table format:

- Sheet number
- The identification number of each tree
- Botanical and common name of each tree
- Diameter at breast height (DBH) of each tree
- Condition of the tree including health, structure, and damage. Use the following (simplified) version of the International Society of Arboriculture (ISA) tree rating system. (Excellent, Good, Fair, Poor, Dead)
- Label the disposition of each tree as “To Remain,” “To Be Removed,” or “To Be Relocated.” The location for relocation may be added. For CADD symbols refer to **Exhibit 323-3**.
- If a tree or palm is removed following the Vegetation Survey, note ‘Tree/Palm does not exist’

Note: Collecting and providing information on the height and spread of trees may not be cost effective, relevant, or feasible, depending on the scale of the project.

A note must be added to the Tree Disposition Charts when all trees are not shown from the Tree Survey.

Determine if the following is useful information, and provide if required:

- Approximate Tree height (feet)
- Approximate Canopy spread (feet)
- Location of the tree. Location can be based on roadway stationing numbers, quadrants, or sheet numbers.

Site-specific requirements may be included under the “Notes” column. Site-specific requirements may include:

- Watering schedule
- Fertilizer mix
- Fertilizer schedule
- Backfill or soil amendments.
- Root or Branch pruning and intent (structural, aesthetic, safety, etc.)

An example of a Tree Disposition Chart is included as **Exhibit 323-4**.

323.6 Root and Branch Pruning

Root and/or Branch pruning can be shown in a plant schedule in either the Selective Clearing and Grubbing, Landscape, or Tree Disposition Plans. Do not duplicate information on separate plan sets. Use the sequence of construction to determine where to show root or branch pruning. If root or branch pruning will need to be accomplished early in the construction process, show on the Selective Clearing and Grubbing Plans. If pruning needs to be accomplished late in the construction process, show pruning on the Tree Disposition or Landscape Plans. Always specify the pruning objectives, whether for structural purposes, aesthetics, safety, clearance, etc. Ensure there is enough information provided so this work can be accurately bid by the Contractor and inspected for compliance by the Engineer.

324 Miscellaneous Structures Plans

324.1 General

Miscellaneous structures not included in the bridge plans must be included in the appropriate component plans. This includes high mast lighting supports, traffic mast arm supports, signal strain poles, overhead sign supports, rest area structures or buildings, barrier walls (traffic or sound), retaining walls and toll facilities.

For guidelines on structural detailing, refer to the [Structures Detailing Manual](#).

324.2 Approach Slabs

Custom approach slab sheets for non-standard designs and supplemental approach slab detail sheets called for by [Standard Plans, Indexes 400-090](#) and [400-091](#) are included in the structures plans. However, some roadway elements may need to be carried onto the approach slab. In these cases, clarify in the plans which elements are to be included as part of the roadway.

Elements that are part of the roadway approaches to the bridge and interface with the approach slabs areas (e.g., stabilization, guardrail, earthwork, sidewalks, approach slab surfacing) are to be included and paid for in the roadway quantities.

Modification for Non-Conventional Projects:
Delete the last paragraph.

324.3 Retaining Walls

Non-proprietary retaining walls require complete design and construction details in the contract plans. Proprietary walls require a set of control plan details to be included in the contract plans.

See **FDM 262** for retaining wall plans submittal procedures. See also the [Structures Manual](#) for plan content requirements.

On projects with bridges, include the control plan details in the bridge plans. When there are no bridge plans, include the control plan details in the appropriate component plans. Examples of control plan details are included in the [Structures Detailing Manual](#).

Vendor Drawings for proprietary wall systems listed on the [APL](#) are provided on the Program Management Office website.

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.

Concrete box culverts require complete design and construction details to be included in the contract plans. Include the following minimum design details:

(1) Plan and Elevation Sheets:

- (a) Plan view showing: Grid north arrow; scale bar; existing highway boundaries including existing R/W monuments; new R/W line(s) including proposed R/W monuments; culvert or bridge identification number; culvert and highway alignment; survey baseline; profile grade line; direction of stationing; stream channel alignment; stream flow direction; skew angle of the culvert relative to the centerline of roadway; stationing along the profile grade line including begin and end station of culvert (outside face of sidewalls); length of culvert; subsurface exploration locations (e.g., boring locations); culvert end treatment (e.g., headwall and wing wall orientation); scour protection; slope protection; limit of stream work; utilities; traffic railing and pedestrian/bicycle railing type.
 - (b) Elevation view showing: Elevation vertical scale; profile grade line and vertical data; existing stream bottom and ground line (along PGL); utilities.
- (2) A longitudinal section along the culvert centerline showing: Culvert or bridge identification number; invert elevations; existing stream bottom or original ground; culvert stationing at centerline; typical highway section (including rail treatment); design earth cover height (measured from the top of the top slab to the top of pavement); limits of scour protection (including any keyways or geotextile fabric lining); channel work; culvert end treatments; utility (either attached to the fascia, or in the embankment, traffic railing or sidewalk); wing walls; headwalls; cutoff walls; reference to the appropriate Standard Plans.
 - (3) Data Sheets: Box Culvert Data Table and Reinforcing Bar List ~~are to be placed in a Structures Component.~~
 - (4) Miscellaneous details showing: Construction phasing information (affects lengths of precast segments and potential need for skewed segments) including appropriate excavation support and protection systems (e.g., critical temporary

walls); traffic railing details including connection details; slope and/or stream bank protection; channel section detail; culvert-end safety grate, guardrail or fencing details when applicable; removal of existing culvert(s); cofferdams or water diversion.

- (5) Notes indicating: Live loading requirements (HL-93 or HS-25); hydraulic data (show 100-year design flow or the design flow used and the minimum hydraulic area perpendicular to flow below the Design High Water); environmental classification for durability; minimum concrete class and reinforcing steel grade; assumed soil weight, angle of internal friction and nominal bearing capacity; differential soil settlement height and effective length (when significant); precast culvert limitations; any special joint waterproofing requirements; erosion and sediment control and stormwater pollution prevention plan requirements; restrictions for work in streams; estimated quantities.
- (6) A ~~Plan and Elevation sheet and a~~ Load Rating Summary sheet are is required for box culverts classified as bridge culverts (per **FDM 265.1**). ~~These~~ This sheets ~~are~~ is to be placed in a Structures Component.

In accordance with the ***Basis of Estimates***, load pay items and quantities in the structures category.

324.5 Three-Sided Concrete Culverts

These sheets are to be placed in a structure component, even when there are no bridge plans.

Complete footing, wingwall and channel lining designs and construction details are required for three-sided culverts. However only conceptual culvert barrel and headwall design details need to be provided. Include the following minimum design details in the plans:

- (1) Plan view showing the orientation of the ends of the structure. The two most typical options for culverts on a skew are ends parallel to the centerline of the roadway (skewed ends) or ends perpendicular to the centerline of the structure (square ends). The end treatment depends upon the skew, whether it is in a fill section or at grade, the location within the R/W, conflicts with utilities, phased construction details, the alignment of the feature crossed, and other site limitations.
- (2) Elevation view showing the configuration of the most appropriate type unit; e.g., frame or arch. Show any limitations on using a larger span (some manufacturers only fabricate units at fixed increments of span length, therefore showing the limitations will allow the manufacturers to bid using special units or the next larger span length of their standard units). Show other acceptable structure types in

- separate partial elevation views. Show limiting spans and heights for all alternatives.
- (3) No precast manufacturer should be eliminated from consideration for a given project. However, specific project requirements that may exclude some manufacturers must be identified (such as fabrication on a skew or a desired arched appearance).
 - (4) Complete details for a cast-in-place footing design, including design loads and assumptions for the spread footings.
 - (5) Complete details for cast-in-place wingwalls, including geometry and reinforcement details.
 - (6) Include the applicable details in **FDM 324.4**.
 - (7) Place the following notes adjacent to the plan or elevation views, as applicable:
 - (a) The assumed foundation vertical reaction is ____ kips/ft. The assumed foundation horizontal reaction is ____ kips/ft. The Contractor must submit a revised foundation design to the Engineer if the actual loads of the supplied structure exceed these assumed values. Any revised foundation design must be included in the shop drawings and submitted for approval at the same time as the design calculations for the three-sided structure.
 - (b) In cases where squaring of the unit ends would create a geometric conflict with right of way, utilities, phase construction or site geometry, include the following note:
 - (c) Due to site restrictions, only skewed end units are acceptable.
 - (d) If site constraints do not eliminate the squaring of the ends, include the following note:
 - (e) Squared end units may be substituted for skewed end units with no change in the payment limits and no additional cost to the Department.
 - (f) When traffic railings are attached to skewed headwalls and site constraints do not eliminate the squaring of the ends, include the following note:

If the Contractor proposes to substitute square ends, details of the traffic railing attachment must be provided in the shop drawings and approved by the Engineer.

325 Signing and Pavement Marking Plans

325.1 General

Signing and Pavement Marking (S&PM) Plans are usually a component set of plans. Component plans are assembled as a separate plan set complete with a Key Sheet and all other required signing and pavement marking sheets. Number the component plans with the sheet numbers prefixed by the letter “S”; e.g., S-1, S-2, S-3. Projects with minimal signing and pavement marking improvements may show these features on signing and pavement marking sheets in the roadway plan set (lead component) or detailed on the Roadway Plan sheets. Do not use the prefix letter “S” when including signing and pavement marking sheets in the roadway plan set. Comply with the requirements in **FDM 230** in the selection of the permanent pavement marking materials to be used.

325.1.1 Signs Mounted on Signal Installations

Show, detail, and tabulate signs mounted on signal span wires or mast arms in the Signalization plans.

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.

325.3 Signature Sheet

See **FDM 303** for Signature Sheet requirements.

325.4 Tabulation of Quantities and Pay Item Notes

The Tabulation of Quantities Sheets and Pay Item Notes are no longer produced. See **FDM 902** for guidance.

325.5 General Notes Sheet

Show general notes on a separate General Notes sheet. See **FDM 311** for instruction in creating a General Notes sheet.

325.6 S&PM Plan Sheets

Prepare S&PM Plan sheets on a standard plan format. The scale should be such that all details are clear and legible. See the requirements of **FDM 312.1** as a guide. For simple projects, or for narrow sections of a project, it may be possible to "stack" two plans on one sheet, one below the other. Stationing is to progress from left to right and be stacked from top to bottom.

Typical drawings may be used on rural projects with long sections of roadway that show only edge and lane delineation lines. Detail sheets should be used to depict markings at intersections. Signs may be tabulated to indicate location and disposition.

See **Exhibit 325-1** for an example Signing and Pavement Marking Plan sheet.

325.6.1 Required Information

The basic information pertaining to roadway geometrics and project limits required on the signing and pavement marking plan sheets is the same as that required on the plan

portion of the plan-profile sheets. Topography and construction details need not be shown. Show underground and overhead utilities, lighting structures, signal structures and ITS structures that may cause construction conflicts with sign components. Check utilities, drainage, landscape features, sidewalks, and driveways for conflicts. Identify those that may cause conflicts in the plans.

Provide the following on the S&PM Plan sheet:

- (1) Flag and station the begin and end of the signing and pavement marking limits.
- (2) Place a north arrow and scale at a point of maximum visibility on the sheet. If two plans are "stacked" on one sheet, then show a north arrow and scale on each plan portion.
- (3) Show regulatory, warning, and directional signs at the proper locations. Show each sign face in close proximity to its respective sign with a leader line connecting the sign location and sign face. Orient each sign face on the plan sheet to be read as viewed from the direction of travel along the roadway. Indicate the location of all signs by station or milepost.
- (4) Provide sign placement (offset) when installation may be in conflict with utilities, drainage, lighting, sidewalks, driveways, and landscape feature.
- (5) Indicate the pay item number, sign size, standard designation, or assigned number (if nonstandard) for each sign.
- (6) Show and label permanent pavement markings specifying width, color and spacing. Indicate begin and end pavement marking stations including offsets, or begin pavement marking station including offset and the total length of roadway pavement marking.
- (7) Identify Audible and Vibratory Treatments by specifying type (ground-in rumble strips or profiled thermoplastic), begin and end limits, and rumble strips configuration (Type A, B, or C). Ground-in rumble strips should be labeled with the permanent pavement marking callout labels. It is not necessary to call out the array type (skip or continuous) for Arterials and Collectors.
- (8) Indicate location of raised pavement markers and delineators by specifying the type, color, spacing, and limits of application by stations.
- (9) Indicate location of tubular markers by specifying color. If applicable, specify the spacing and limits of application by stations.

- | | |
|------|---|
| (10) | Modification for Non-Conventional Projects: |
| (11) | Replace number (5) with the following: |
| (12) | (5) Indicate size, standard designation, or assigned number if nonstandard for each sign. |

325.6.2 Typical Pavement Marking Sheet

For simple projects, or sections of a project, it may be possible to show signing and pavement marking plan details schematically using straight-line format with station limits and typical markings. Show and identify all signs at their graphic location on the straight-line diagram. Show and label pavement markings on a typical marking plan. Include all necessary details for special areas; e.g., median crossovers, turn lanes.

325.7 Guide Sign Worksheet

Show the sign face, with the complete message layout with legend spacing (vertical and horizontal), margins, border widths, and corner radii on the guide sign worksheet.

Cross sections are not required for multi-support roadside signs; however, the support data (size and average length) for each sign must be tabulated on the guide sign worksheet.

This sheet should be prepared on the standard plan sheet format to any convenient scale that will preserve clarity and legibility. The number of signs that may be shown on a single sheet depends on the sign size and complexity. The format of the sheet is flexible as long as the information listed above is shown. Output from the *Transoft GuidSign Program*, or a similar format may be used.

325.8 Multi-Post Sign Supports

Standard foundations for multi-post signs are provided in the [Standard Plans](#). These foundations are based on the sign support size; however, the post size and length are not included in the [Standard Plans](#) and must be included as a part of the design and shown in the plans.

325.9 Overhead Sign Cross Section and Support Structure

The Sign Cross Section sheet shows the location of overhead sign(s) in cross section. A standard profile format should be utilized. Show and fully dimension the cross section of the roadway at the sign location.

The recommended scale for the cross section is 1" = 10' horizontally and vertically.

The design of the support truss, columns, and foundations, along with the boring data information, must be included in the signing and pavement marking plans. The "Cantilever Sign Structures Data Table" and the "Span Sign Structures Data Table" work in conjunction with of the [Standard Plans](#), *Indexes 700-040* and *700-041*. These tables include the information noted above and should be completed by the Structures Engineer of Record (EOR) and inserted as a sheet in the plans.

A computer program for the design of overhead cantilever sign structures and a program for the design of overhead span sign structures are available. The programs were developed by the Structures Design Office and may be downloaded from the Structures Design web site.

The design of the attachment system for signs mounted on bridge structures is the responsibility of the Structures EOR. Include the design of the attachment system in the structures plans if bridge work is included in the project. If bridge work is not in the project, place the design details in the signing and pavement marking plans.

Exhibit 325-1: Signing and Pavement Marking Plan

326 Lighting Plans

326.1 General

Lighting plans include construction details, electrical circuits, pole data, conduits, service points, luminaires, foundations, boring details, and other data relevant to lighting projects.

Lighting plans are usually a component set of plans. Component plans are assembled as a separate plan set complete with a Key Sheet and all other required lighting sheets. Number the component plans with the sheet numbers prefixed by the letter “L”; e.g., L-1, L-2, L-3. Projects with minimal lighting improvements may show these features on lighting sheets included in the roadway plan set (lead component) or detailed on the Roadway Plan sheets. Do not use the prefix letter “L” when including lighting sheets in the roadway plan set.

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.

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

326.3 Signature Sheet

See **FDM 303** for Signature Sheet requirements.

326.4 Tabulation of Quantities and Standard Notes

The Tabulation of Quantities Sheets and Pay Item Notes are no longer produced. See **FDM 902** for guidance.

326.5 General Notes Sheet

Show general notes on a separate General Notes sheet. See **FDM 311** for instruction in creating a General Notes sheet.

326.6 Lighting Data Table and Legend Sheet

Prepare the Lighting Data Table and Legend sheet on a standard plan format and include details and notes pertaining to pole placement and construction. Provide a listing of each pole by pole number on this sheet. The following information must also be given for each pole:

- (1) Roadway Station and Offset
- (2) Number of Luminaires
- (3) Mounting Height
- (4) Arm Length
- (5) Arm Configuration (e.g., Top Mount)
- (6) Location (e.g., Mast Arm)
- (7) Foundation (e.g., Cylindrical)
- (8) Pay Item Number - The pay item number will indicate if the pole is a standard pole or a special design. Two groups of pay item numbers are utilized: one for standard poles and one for non-standard poles.

Modification for Non-Conventional Projects:
Delete Item (8) from the above list.

~~_Show the design values for light intensities and uniformity ratios together with a legend and description of the symbols used on the plan sheets.~~

Within the legend, show symbols and descriptions for the design luminaires used per location in the plan sheets. At a minimum, include each design luminaire's make, model, input voltage, wattage, lumen output, Correlated Color Temperature (CCT), and distribution pattern. Additionally, define symbols for existing light pole removal, conduits, pull boxes, load centers, power points, service points, foundations, and other design elements, as necessary.

326.7 Lighting Plan Sheets

Prepare Lighting Plan sheets on a standard plan format. The scale must be such that all details are clear and legible; however, the scale must not be smaller than 1" = 100'. For simple projects, or for narrow sections of a project, it may be possible to "stack" two plans on one sheet, one below the other. Stationing must progress from left to right and be stacked from top to bottom. Clarity and legibility must be preserved in all cases.

Use symbols in accordance with the requirements of the FDOT CADD Software.

326.7.1 Required Information

The basic information pertaining to roadway geometrics and project limits required on the lighting plan sheets is the same as that required on the plan portion of the roadway plan-profile sheets. Topography and construction details need not be shown. Show underground and overhead utilities, signing structures, signal structures and ITS structures that may cause construction conflicts with lighting components. Check utilities, drainage, signal structures, sign structures, landscape features, sidewalks, and driveways for conflicts. Identify those that may cause conflicts in the plans.

Provide the following on the Lighting Plan sheet:

- (1) Show existing high mast light poles and label as existing poles. For existing high mast light poles to be removed, include the existing foundation depth when information is provided by Department and label as "for information only."
- (2) Show the lighting layout on the plan format using symbols which represent poles, conduits and service points.
- (3) Flag and station the begin and end of the lighting limits.

- (4) Place a north arrow and scale at a point of maximum visibility on the sheet. If two plans are "stacked" on one sheet, include a north arrow and scale in each plan portion.
- (5) Note conduit runs providing conduit size, number and conductor sizes.
- (6) Flag poles providing pole number, baseline or centerline station, circuit number, and offset from baseline or centerline (for high mast). Show the symbols for poles at the correct baseline or centerline station and note the approximate offset from the roadway.
- (7) Flag and station service point locations as determined through utility negotiations. [Standard Plans, Index 639-001](#) provides details for the service point. Provide the following service point description on the Lighting Plan sheet:
 - (a) Voltages and Phases (e.g., 240/480 Volt, 3 phase)
 - (b) Main or overhead breaker size
 - (c) Number of branch circuits and breaker size of each

326.8 Foundation Details Sheet

The foundation design for standard conventional poles is shown in the [Standard Plans, Index 715-002](#). The foundation design for standard high mast light poles is shown in the [Standard Plans, Index 715-010](#). These foundations do not need to be shown in the plans.

Provide design details in the plans for non-standard foundations for any of the following conditions:

- Non-standard high mast poles
- Soil conditions weaker than those shown in the [Standard Plans](#) (applies to high mast poles and conventional poles)
- Other site restrictions (e.g., limited R/W, utility conflicts)

326.9 Boring Data Sheet

Boring Data sheets provide the boring data for high-mast poles and non-standard foundation details.

326.10 Temporary Highway Lighting

Temporary Highway Lighting is not required. See **FDM 240** for guidance. If used, provide “Temporary Highway Lighting Plans,” and include all applicable lighting plans components as described above. Required plans content will depend on complexity of Temporary Highway Lighting placement. At a minimum, provide plans components with following:

(1) Lighting Data Table, listed by TTC phase and stationing range, including:

- (a) Pay Item quantity
- (b) light pole type (referenced standard or other)
- (c) light pole offset (meeting minimum offset requirements)
- (d) light pole spacing
- (e) foundation type (referenced standard, barrier-mounted, or other)

Note: Multiple TTC phases may be listed per row

- (2) Plan sheets showing light pole locations for complex projects (not required for simple layouts)
- (3) Engineering drawings and notes as required to show applicable requirements of FDM 240 (e.g., barrier bracket mount details, Type K Temporary Barrier anchorage details or reference, 1'-6" pole setback, etc.)

<u>Modification for Non-Conventional Projects:</u>
<u>Delete item 1(a) from the list above.</u>

327 Signalization Plans

327.1 General

Signalization plans include construction details, electrical circuits, signal phasing, and other data relevant to signalization projects.

Signalization plans are usually a component set of plans. Component plans are assembled as a separate plan set complete with a Key Sheet and all other required signalization sheets. Number the component plans with sheet numbers prefixed by the letter "T"; e.g., T-1, T-2, T-3.

Projects with minimal signalization improvements may show these features on signalization sheets included in the roadway plan set (lead component) or detailed on the Roadway Plan sheets. Do not use the prefix letter "T" when including signal sheets in the roadway plan set.

327.1.1 Signs Mounted on Signal Installations

Show, detail and tabulate the signs mounted on signal span wires or mast arms in the Signalization Plans.

327.1.2 Rectangular Rapid Flashing Beacons (RRFBs)

Show, detail, and tabulate RRFBs mounted overhead or as a standalone assembly in the Signalization Plans

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.

327.3 Signature Sheet

See **FDM 303** for Signature Sheet requirements.

327.4 Tabulation of Quantities and Standard Notes

The Tabulation of Quantities Sheets and Pay Item Notes are no longer produced. See **FDM 902** for guidance.

327.5 General Notes Sheet

Show general notes on a separate General Notes sheet. See **FDM 311** for instruction in creating a General Notes sheet.

Include on the General Notes sheet special signal design information such as controller operations, loop installations, signal heads, interconnect cable, and computer interface that is generally not covered in the [Standard Specifications](#), or Supplement and Special Provisions.

327.6 Signalization Plan Sheet

Prepare Signalization Plan sheets on standard plan format at a scale large enough to show all details clearly and legibly. The recommended scale is 1" = 40' or 1" = 50'. The complete intersection is typically shown on one plan sheet; however, for large intersections more sheets may be used with appropriate match lines.

Use symbols in accordance with the requirements of the FDOT CADD Software. Prepare a separate Plan Sheet for each signalized intersection included in the construction project.

327.6.1 Required Information

The basic information requirements include roadway geometrics, street names, construction stationing or milepost, curb and gutter, drainage inlets, sidewalks and R/W lines as similarly required on the plan portion of the Roadway Plan-Profile sheets. Show underground and overhead utilities, signing structures, and lighting structures that may cause construction conflicts with signal components. Check utilities, signing and pavement marking features, drainage, landscape features, sidewalks, and driveways for conflicts. Identify those that may cause conflicts in the plans.

Provide the following on the Signalization Plan sheet:

- (1) North arrow and scale at a point of maximum visibility on the sheet.
- (2) Signal head locations with orientation arrows and movements (movements 2 and 6 must be the major streets).
- (3) Details of signal heads in tabular form with pay item numbers.

Modification for Non-Conventional Projects:
Delete Item (3) and replace with the following:
(3) Details of signal heads in tabular form.

- (4) Phasing diagram/signal operating plan. If the SOP conforms to the [Standard Plans, Index 671-001](#), then a reference to the index is all that is required. For all other operating plans, the plan must be shown.
- (5) Signal controller timing chart.
- (6) Loop detectors.
- (7) Electrical service location.
- (8) Location of signal poles and span wires include ground and roadway crown elevations.
- (9) Signal wire signs.

- (10) Pedestrian signals including station and offsets. See ***Standard Plans Instructions for Index 665-001 (SPI-665-001)*** for additional information on pedestrian detector location and orientation~~details~~.
- (11) Turning radii.
- (12) Median nose locations.
- (13) Location of "stop bars" and pedestrian crosswalks.
- (14) Coordination unit-timing chart.
- (15) Lane lines with orientation arrows.
- (16) Location of conduits.

Label all equipment shown with their respective pay item numbers.

Modification for Non-Conventional Projects:

Delete the above sentence and replace with the following:

Label all equipment shown.

327.7 Interconnect/Communication Plan Sheet

The Interconnect/Communication (I/C) Plan sheet is required when signal equipment is being coordinated with other signal installations or with a computerized system. The I/C Plan sheet shows pictorially the placement of I/C cable, either underground or aerial, pull boxes or aerial junction boxes, and tabulates all related interconnect quantities. The I/C Plan sheet must indicate signal poles, service poles, and joint-use poles to which I/C cable will be attached.

Modification for Non-Conventional Projects:

Delete the above sentence and replace with the following:

The Interconnect/Communication Plan sheet shows pictorially the placement of interconnect/communication cable, either underground or aerial, and, pull boxes or aerial junction boxes.

Prepare the I/C Plan sheet on standard plan format. Use a scale 1" = 100' for underground cable, and 1" = 200' for aerial cable. For simple projects, or sections of a project, "stacking" two plans on one sheet is generally permitted if clarity and legibility are

maintained. Stationing must progress from left to right and multiple plan views be stacked from top to bottom.

Place a north arrow and scale at a point of maximum visibility on the sheet. If two plans are "stacked" on one sheet, include a north arrow and scale in each plan portion.

The basic plan information requirements include roadway schematic, showing cross streets and driveways, cable information, pole location, pole number, utility pole identification number and pay item number.

327.8 Mast Arm Details Sheet

See [Standard Plans](#), *Index 649-030* (Standard Mast Arm Assemblies) or *Index 649-031* (Special Mast Arm Assemblies) and the associated *Standard Plans Instructions (SPIs)*.

327.9 Foundation Details Sheet

Foundations for non-standard mast arm poles and foundations in soil conditions weaker than those shown in the [Standard Plans](#) must be designed by the responsible structures design engineer of record. The construction details for the non-standard design are shown on the Foundation Details sheet.

The foundation design for standard mast arm poles is shown in the [Standard Plans](#), *Indexes 649-030, and 649-031* . These foundations do not need to be shown in the signalization plans.

327.10 Boring Data Sheet

Boring Data sheets provide the boring data for mast arm poles and non-standard foundation details.

328 Intelligent Transportation Systems Plans

328.1 General

Intelligent transportation systems (ITS) plans include construction details, electrical circuits, and other data relevant to ITS projects. The following are some of the different systems that may be produced:

- (1) Freeway Management System,
- (2) Incident Management System,
- (3) Arterial Management System,
- (4) Emergency Management Systems,
- (5) Transit Management Systems,
- (6) Electronic Toll Collection,
- (7) Electronic Fare Payment,
- (8) Highway Rail Intersections (under electronic surveillance), and
- (9) Regional Multimodal Traveler Information

ITS plans are usually a component set of plans. Component plans are assembled as a separate plan set complete with a Key Sheet and all other required ITS sheets. Number the component plans with sheet numbers prefixed by the letter "IT"; e.g., IT-1, IT-2, IT-3.

Projects with minimal ITS improvements may show these features on ITS sheets included in either the roadway or signalization plan set or detailed on the Roadway or Signalization Plan sheets. Do not use the prefix letter "IT" when including ITS sheets in the roadway plan set. Use the prefix letter "T" when including ITS sheets in the signal plan set.

When buried FDOT fiber optic cable exists within the project limits, coordinate with the ITS and TSM&O groups within the District Traffic Operations office and include the ITS Locator pay item in the Estimated Quantities Report.

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.

328.3 Signature Sheet

See **FDM 302** for Signature Sheet requirements.

328.4 Tabulation of Quantities and Standard Notes

The Tabulation of Quantities Sheets and Pay Item Notes are no longer produced. See **FDM 902** for guidance.

328.5 General Notes

Show general notes on a separate General Notes sheet. On the ~~general~~ **General notes Notes** sheet, lists the following:

- Special ITS design information that is generally not covered in the **Standard Specifications**, Supplemental **Specifications**, or Special Provisions.

- The ~~general notes sheet lists the~~ Department’s contact information for the fiber optic cable route marker label.

See **FDM 311** for further instructions in-on creating a General Notes sheet.

328.6 ITS Plan Sheets

Prepare ITS Plan sheets on standard plan format. The scale must be such that all details are clear and legible. See the requirements of **FDM 312** as a guide. Place a north arrow and scale at a point of maximum visibility on the sheet.

328.6.1 Required Information

The basic information requirements include roadway geometrics, project limits, street names, construction stationing or milepost, curb and gutter, drainage inlets, sidewalks and right of way lines as similarly required on the plan portion of the roadway plan-profile sheets. Show underground and overhead utilities, signing structures, and lighting structures that may cause construction conflicts with ITS components. Check utilities, drainage, landscape features, sidewalks, and driveways for conflicts. Identify those that may cause conflicts in the plans.

Where details normally shown on roadway plans would obscure ITS features, the details may be screened so long as the details remain plainly legible.

Clearly label all equipment shown on the plan with their respective pay item numbers. In addition, the following plan elements should be shown:

Modification for Non-Conventional Projects:

Delete the above paragraph and replace with the following:

Clearly label all equipment shown on the plan. In addition, the following plan elements should be shown:

- (1) Cabling, fiber optic splicing, and interconnects.
- (2) System communication devices.
- (3) Electrical power service equipment and interconnects.
- (4) Grounding and transient voltage protection details.
- (5) Structure-mounted or ground-mounted field cabinets for system electronics, maintenance service points, and interconnect.

328.6.1.1 Dynamic Message Sign

Plans for a Dynamic Message Sign (DMS) installation should illustrate the location, placement, and typical details of the following components:

- (1) DMS Housing, including details and notes that identify type of display (monochrome, full-color, or tri-color), size of display matrix (height, width, number of lines, and number of characters per line), and type of mechanical construction (walk-in, front access, or embedded).
- (2) DMS controller.
- (3) DMS Uninterruptible Power Supply (UPS) system.
- (4) DMS support structures, including external walkways, safety railings, and ladders.
- (5) DMS mounting brackets and hardware.
- (6) A ground-level cabinet for a DMS controller and associated electronic equipment.
- (7) Telemetry equipment details for remote sensing and control

328.6.1.2 Highway Advisory Radio

The design for a Highway Advisory Radio (HAR) installation should illustrate the location, placement, and typical details of the following components:

- (1) HAR operator workstation and central recording facility.
- (2) HAR antennas.
- (3) HAR transmitter and electronics.
- (4) HAR support structures, signage, and beacons.
- (5) HAR mounting brackets and hardware.

328.6.1.3 Video Display Equipment

Provide mounting and installation plan sheets for each color video monitor, flat panel display, and rear projection video unit in the video display system. Depict in the mounting plans detailed structural mounting information, including support structures, wall attachment methods, and the weights of the display units. Provide cable routing plan sheets and diagrams for the devices, along with maintenance/service points and structural certification.

The plans should illustrate the location, placement, and typical details of the following video display system components:

- (1) Video display controller.
- (2) Operator workstations.
- (3) Encoders, decoders, multiplexers, and routing equipment.

Develop sheets that detail cross-sections and elevations for all modifications to existing wall systems in the TMC facility.

For the rear projection video unit mounting and installation plans, include details that illustrate stacking configuration and support design, along with a ventilation and climate control plan. Provide cable routing plans that include detailed connection diagrams for individual and stacked configurations.

328.6.1.4 Network Devices

Plans including network devices should illustrate the following system attributes:

- (1) System diagrams illustrating network and device interconnect.
- (2) General network topology.
- (3) Notes regarding any special configurations or options for specific devices that are required to achieve a specific system function.

328.6.1.5 Fiber Optic Cable and Interconnect

The plans for fiber optic cable systems should illustrate the location, placement, and typical details of the following components:

- (1) Fiber optic conduits.
- (2) Fiber optic cables.
- (3) Fiber optic splices and terminations.
- (4) Fiber optic cable designating system.
- (5) Fiber optic cable access points.

328.6.1.6 Vehicle Detection and Data Collection

The plans for ~~traffic data and vehicle detection systems~~~~vehicle detection systems~~ should illustrate the location, placement, and typical details of the following components:

- (1) Diagrams illustrating detection system interconnect.
- (2) General network topology.
- (3) Notes regarding any special configurations or options for specific devices that are required to achieve a specific system function.

328.7 Modified ITS Plans Format

The modified plans format allow for “letter type” plans and include a table to locate ITS devices by mile post to three decimal places, plus an offset dimension given for each aboveground structure. Global positioning system (GPS) coordinates can be utilized as supplemental information in the table.

The modified plans should include the following:

- (1) Table (spreadsheet) to locate devices to include device ID, description, milepost three decimal places, offset, and a comment field. Add an extra column to the table if GPS coordinates are provided for the devices.
- (2) Offset dimensions from the edge of the traveled way to the aboveground ITS device installations.
- (3) A cross section for devices such as DMS that require overhead structures.
- (4) Number and sizes for conduit.
- (5) Number of fibers for fiber optic cable.
- (6) Size and numbers of pairs for twisted pair copper cables.

Aerial photographs should be furnished with the table above to provide supplementary information. The aerial plan sheets typically do not require R/W lines, baseline, or roadway edges to be shown. The aerial plan sheets are used as a base for the as-built plans.

329 Landscape Plans

329.1 General

Landscape refers to any vegetation, mulches, and irrigation systems. Designs may include hardscape features (e.g., street furniture, specialty paving, tree grates, walls, planters, fountains, fences, landscape lighting). Hardscape-only projects are not landscape projects. Landscape may be constructed as a standalone project or as a component of a roadway project.

The Legislature requires that the Department commit program dollars to purchase plant materials from Florida commercial nursery stock. In order for the Department to capture that information, it is critical that all small and large plant pay items be placed in AASHTOWare Project Preconstruction™ (formerly TRNS*PORT) Category 0600.

Landscape Plans can be prepared as either a component set of plans, or as a standalone Landscape plans set. Landscape Plans are assembled as a separate plan set complete with a Key Sheet and all other required landscape sheets. When prepared as a component set of plans, number the sheets with the prefix “LD”; e.g., LD-1, LD-2, LD-3. When prepared as a Standalone Landscape plan set, the prefix is not needed.

Projects with minor landscaping may show these features on landscape plan sheets in the roadway plans set (lead component), or detailed on Roadway Plans sheets. Do not use the prefix letter “LD” when including landscaping sheets in the roadway plan set.

329.2 Key Sheet

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)

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

For Standalone Landscape plan sets, refer to **Exhibit 302-1** for an example of a lead Key Sheet with no revisions and **Exhibit 302-2** for a lead Key Sheet with Revisions. Assemble Standalone Landscape plans in the following order:

- (1) Key Sheet
- (2) Signature Sheet
- (3) General Notes
- (4) Plant Schedule
- (5) Project Layout
- (6) Selective Clearing and Grubbing Plan (if applicable)
- (7) Tree Disposition Plan (if applicable)
- (8) Tree Disposition Charts (if applicable)
- (9) Landscape Plan
- (10) Landscape Details
- (11) Irrigation Plan

- (12) Irrigation Details
- (13) Temporary Traffic Control Plan (if applicable)
- (14) Stormwater Pollution Prevention Plan (if applicable)

329.3 Signature Sheet

See **FDM 303** for Signature Sheet requirements.

329.4 Plant Schedule

The Tabulation of Quantities Sheets are no longer produced. See **FDM 902** for guidance.

The Plant Schedule sheet tabulates the planting materials, landscape soil work, and other materials required for the installation of plant materials. If irrigation elements are included, a separate Plant Schedule is required. If hardscape elements are included, use a Plant Schedule containing information for each element.

When completing the Estimated Quantities Report per **FDM 902**, use the following Pay Size categories:

Pay Size categorized as small plants include:

- All ground covers
- Shrubs, trees, and cycads less than 7 gallons
- Clustering palms, up to 6-foot height

Pay Size categorized as large plants include:

- Shrubs, trees, and cycads, 7 gallons or greater
- Single-trunk palms
- Clustering palms, 6-foot height or greater

Modification for Non-Conventional Projects:

Delete ***the last paragraph.***

329.5 General Notes

Show general notes on a separate General Notes sheet. See **FDM 311** for instructions in creating a General Notes sheet. General Notes can be used to describe site-specific requirements, such as:

- Watering schedule
- Fertilizer mix
- Fertilizer schedule
- Backfill or soil amendments
- Utility providers list
- Sight line and/or design speed criteria
- Maintaining authority contact information

329.6 Landscape Plan Sheets

Prepare Landscape Plan sheets on a standard plan format. The scale should be such that all details are clear and legible. See the requirements of **FDM 312.1** as a guide. For simple projects, or narrow sections of a project, it may be possible to "stack" two plans on one sheet, one below the other. Stationing must progress from left to right and be stacked from top to bottom. Irrigation plan sheets may be prepared at a larger scale than the planting plan sheets. Clarity and legibility must be preserved in all cases.

Place a north arrow and scale in a conspicuous location, typically in the upper right portion of the sheet. If two plans are "stacked" on one sheet, include a north arrow and scale in each plan portion.

329.6.1 Required Information

The basic information required is as follows:

- (1) Project centerline
- (2) Edge of pavement (edge of traffic lanes)
- (3) Curbs
- (4) Drainage systems
- (5) Guardrail
- (6) R/W or limited access fence line
- (7) Sidewalks or other planned or existing structures

- (8) Lighting, signs and signal poles
- (9) Intersections and driveways which are noted in the plans
- (10) Existing and proposed overhead and underground utility locations
- (11) Clear Zone/Lateral offset (should be plotted or distances noted frequently on each plan sheet)
- (12) View zones for permitted outdoor advertising signs
- (13) Canopy limits
- (14) Existing vegetation (to remain or be removed)
- (15) Existing off-site features and conditions that affect or are affected by the project
- (16) Fence and gate locations
- (17) Setbacks from structural elements or drainage system
- (18) Limits of clear sight (see **FDM 212.11**)
- (19) Transit Facilities
- (20) Mowing Limits

Where necessary, required sheet elements may be “screened” to provide legibility for the landscape plans, so long as the required elements remain apparent.

Planting plan sheets must also provide at a minimum the plant symbols, common name, and botanical names of each plant.

Include the following on the planting plan sheets:

- Hardscape and site amenities; e.g., street furniture, specialty paving, tree grates, walls, planters, fountains, fences, and lighting (excluding public utility street and area lighting).
- Location and depth to improve soil structure (a.k.a., soil scarification), amend existing soil, or replace existing soil with Landscape Soil
- Soil scarification and amendment requirements may be described on the General Notes sheet if they are simple. Detailed requirements (e.g., those that vary for specific areas) should be described separately for each amendment type. Each type of soil scarification, amendment, or replacement should be defined (e.g., Type ‘A’), specified, and quantified on the Plant Schedule.

Prepare irrigation plan sheets using the planting plan sheets (devoid of unnecessary text and labeling) and include information pertaining to the irrigation system. Information on the sheet must include the approximate location of spray heads and rotors, valves,

mainlines, lateral lines, sleeves (noting the diameter sizes), controllers, water sources and points of connection, backflow preventers, and isolation valves.

The Details Sheet must include a legend clearly depicting the symbology used in the irrigation plan sheets and an associative description for each entry. Additional information such as the nozzle and component schedule, irrigation zone, or lateral schedule can be included on these sheets.

329.7 Landscape Details Sheet

This sheet may be used to show landscape details, hardscape details, and irrigation details, that are applicable to the project and not addressed in the [Standard Plans](#).

Details provided in **Standard Plans, Index 580-001**, are provided for root establishment purposes only. When trees or palms are above 30 feet in overall height, or within falling distance of a roadway, pedestrian or bicycle route, designer is to provide tree and/or palm bracing details and **Standard Plans, Index 580-001** does not apply. Designer is to provide details when bracing is intended to be used for safety considerations. The following are examples of safety considerations:

- Tree or palm is within falling distance of a roadway, pedestrian, or bicycle route
- Tree or palm is over 30 feet in height
- Commonly exposed to higher wind speeds
- Non-standard soil properties exist
- Non- standard plant dimensions exist
- When rootball exceeds 4 feet in diameter and it is located on a 1:3 slope or steeper
- Tree bracing impedes the line of sight or clear sight triangles.

Exhibit 329-1: Plant Schedule

330 Utility Work by Highway Contractor Agreement Plans

330.1 General

Most utility adjustment work is performed by the utility owners or their contractor. In some cases, it is advantageous to the Department and Utility to include the utility work as part of the roadway contract. In such cases the Department will enter into an agreement with a Utility for this purpose. These agreements are called Utility Work by Highway Contractor (UWHC) Agreements. The highway contractor is required to construct or relocate the specified utilities in accordance with the plans and special provisions developed by the Utility and incorporated as part of the bid package.

Typically, utility projects are included as strung projects. There are times when a utility company may reject the bid amount for their project. As a separate set of plans, the quantities and cost can be readily extracted from the contract.

Occasionally utility work may extend outside the normal construction limits of the project. When this is the case the limits of the utility work must be shown or noted on the plans.

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)

Modification for Non-Conventional Projects:
Delete Item (3) from the above list.

Reflect any special technical or relocation agreement provisions in the plans. In some cases, it may not be practical or reasonable to develop separate plans sets for incidental construction under a UWHC Agreement. The EOR should consult with the District Utility Engineer to determine the requirements in these cases. For further financial guidance, contact the Department's Office of Comptroller, General Accounting Office.

330.2 Key Sheet

The key sheet is the first sheet in the component plan set and must be prepared as described in **FDM 302**. The location map and contract plans set information are not required if shown on the lead key sheet. Show the index of plan on the left side of the sheet. Other data, including name, consultant contract number, and vendor number of the firm (when plans are prepared by a consultant), must be shown as described in **FDM 302**.

Refer to the [Work Program Instructions](#) for guidance on the Financial Project ID phase number identification.

330.3 Signature Sheet

See **FDM 303** for Signature Sheet requirements.

330.4 Tabulation of Quantities

The Tabulation of Quantities Sheets are no longer produced. See **FDM 902** for guidance.

330.5 Plan Sheets

Utility plans must show full construction details for all utilities to be relocated or constructed by the contractor as covered by the UWHC Agreement. A plan-profile sheet format should be utilized where appropriate. Show all underground utilities in the plan portion, and those which equal or exceed 4" must also be shown in the profile portion. Show all above ground Utilities in the plan portion (inclusive of underground connections).

When the construction limits are restricted such as when a power line is above and near a sanitary or water facility, either the facility (overhead lines) must be identified and shown in profile, or the minimum available vertical clearances, along with the type facility, stated on the plans. Show applicable project information similar to that described in **FDM 312**. Show utilities to be relocated or constructed in plan and profile and in accordance with the FDOT CADD Software. The scale used should be the same as that used for the roadway plan-profile sheets.

The disposition and final ownership of any utility infrastructure that is to be removed by the contractor and salvaged must be identified in the plans. Include the address of the Utility/Agency Owner receiving the salvaged utility infrastructure in the UWHC Agreement plans.

Modification for Non-Conventional Projects:

Delete last sentence from the above paragraph. See RFP.