

FY 2019-20 Standard Plans Update Training

Derwood Sheppard, P.E., M.Eng.
Standard Plans Publication Engineer
Central Office, Roadway Design
(850) 414-4334
derwood.sheppard@dot.state.fl.us

Update Training Agenda

➤ General Overview

- Website
- Errata
- Revision History Log
- FDOT Design Manual (FDM) Updates

➤ Standard Plans Updates

- **Derwood Sheppard**
 - Misc. Indexes – Earthwork Details, Superelevation, Turnouts/Driveways, Sidewalk, & Curb Ramps
 - Misc. Traffic Control Signals and Devices
- **Richard Stepp**
 - Guardrail and Single-Slope Concrete Barrier
 - Opaque Visual Barrier
 - Crash Cushions
- **Ed Cashman**
 - Temporary Traffic Control
 - Signing, Signal & Pavement Marking
 - Lighting
- **Cheryl Hudson**
 - Structures Related Indexes



Standard Plans – New Website

<http://www.fdot.gov/design/standardplans/>

The screenshot shows a web browser window displaying the FDOT Standard Plans website. The browser's address bar shows the URL <http://www.fdot.gov/design/standardplans/>. The website header features the FDOT logo and the text "Florida Department of TRANSPORTATION". To the right of the logo is a search bar labeled "Search FDOT..." and links for "E-Updates | FL511 | Mobile | Site Map". Below the header is a navigation menu with links: Home, About FDOT, Contact Us, Maps & Data, Offices, Performance, and Projects. The main content area is titled "Office of Design" and "Standard Plans for Road and Bridge Construction". It includes a sub-header "Office of Design / Standard Plans" and a small FDOT Standard Plans logo. The main content is organized into several sections: "Standard Plans" (with a "NEW" badge), "Design Standards", "Support", "Industry Review", and "Contact Information".

FDOT Florida Department of TRANSPORTATION

E-Updates | FL511 | Mobile | Site Map

Search FDOT...

Home About FDOT Contact Us Maps & Data Offices Performance Projects

Office of Design

Office of Design / Standard Plans

Standard Plans for Road and Bridge Construction

Standard Plans NEW

- Standard Plans for Road and Bridge Construction
- Developmental Standard Plans

Design Standards

- Design Standards (FY 2017-18 and earlier)
- Developmental Design Standards

Support

- Standard Plans CADD - DGN and Cell Libraries
- Standard Plans Training
- Standard Plans History

Industry Review

- Modification Request Origination Form - Form to Propose Revisions to a Standard Plans Index
- Industry Review - Review and Response Packages for Proposed Revisions to a Standard Plans Index

Contact Information

- Roadway Design
- Structures Design
- Drainage Design
- Landscape Architecture
- Traffic Engineering and Operations (Traffic Ops)
- Transportation Monitoring Program (TMP)



<http://www.fdot.gov/design/standardplans/>

The screenshot shows the FDOT website for Standard Plans. The header includes the FDOT logo, the text "Florida Department of TRANSPORTATION", and a search bar. A navigation menu contains links for Home, About FDOT, Contact Us, Maps & Data, Offices, Performance, and Projects. The main content area is titled "Office of Design" and "Standard Plans for Road and Bridge Construction". It features a table of standard plans with columns for Year, Standard Plans, Support, Interim Revisions, Implementation Bulletin, and Effective Date. The table lists two entries: FY 2019-20 and FY 2018-19. The footer includes social media icons, contact information, and the FDOT slogan "Innovative, Efficient and Exceptional".

STANDARD PLANS					
Year	Standard Plans	Support	Interim Revisions	Implementation Bulletin	Effective Date
FY 2019-20	Road Construction Bridge Construction	CADD/CEL	Interim	RDB18-10	07/01/19
FY 2018-19	Road Construction Bridge Construction	CADD/CEL	Interim	RDB17-13	07/01/18



Standard Plans – New Website

<http://www.fdot.gov/design/standardplans/>

Browser address bar: <http://www.fdot.gov/design/standardplans/Current/default.shtm>

Navigation: Home About FDOT Contact Us Maps & Data Offices Performance Projects

Office of Design

Office of Design / Standard Plans / Standard Plans FY 2019-20

Standard Plans - FY 2019-20

See the FDOT Design Manual (FDM), Chapter 115, for additional information on the use of **Standard Plans** within FDOT Contract Plans.

Skip to [Standard Plans for Bridge Construction](#) (Last updated: 11/02/2018)

Standard Plans for Road Construction

Standard Plans Index	Interim Revision or Errata	Index Title	Design Standards Index	Standard Plans Instructions	Design Tools	Contact
Support Detail						
eBook		Standard Plans for Road Construction - Complete eBook				Roadway
Cover		Cover Sheet				
Abbrev		Abbreviations Sheet				
TOC Road		Table of Contents - Road Construction				
Crosswalk		Crosswalk of Design Standards Index to Standard Plans				
Revisions		Revision History Log		SPI		
Miscellaneous						
000-510		Superelevation Transitions - High Speed Roadways	510			Roadway
000-511		Superelevation Transitions - Low Speed Roadways	511			
000-525		Ramp Terminals	525			



Revision Log:

STANDARD PLANS FY 2019-20 REVISIONS LOG

<i>Standard Plans Index</i>	<i>Description</i>
000-506	<i>Changed to Index 160-001.</i>
000-510	<i>All Sheets: Changed Title. Sheet 1: Deleted "DESIGN SPEED" table and "RADIUS OF CURVE" table; Deleted subtitle. Sheet 2: Added Concrete Pavement note to clarify shoulder slope transitions.</i>
000-511	<i>All Sheets: Changed Title, Subtitles, and Renumbered. Sheet 1: Deleted Superelevations Rates Tabulated and Charted Values (information can be found in FDM); combined General Notes with Old Sheet 2; Deleted all callouts for "CHARTED VALUES" on Old Sheet 2. Sheet 2: Updated Subtitle.</i>
000-515	<i>Deleted Index, Criteria information moved to New FDM Chapter 214. Construction details moved to New Indexes 522-003 or 330-001.</i>
000-516	<i>Deleted Index and moved information to Index 330-001.</i>
102-200	<i>Sheet 1: "STORAGE FACILITY" Note; Changed phone number to 407-278-2727.</i>
102-600	<i>Sheet 3: Updated "LENGTH OF LANE CLOSURES" Note. Sheet 9: Changed "DROP-OFF CONDITION NOTES" Note 5.</i>
102-655	<i>Sheet 1: Changed Notes to remove limitations to Limited Access Facilities and Overhead work. Clarified "TRAFFIC PACING GUIDE" notes for the requirements of site specific traffic control plans. Added Note 6 to the "TRAFFIC PACING GENERAL NOTES" for short duration operations.</i>

Individual Chapter Webinars

- Coming Soon!!
- Announcement will be sent out



FDM 115



www.fdot.gov/roadway/fdm

Florida Department of TRANSPORTATION

Home About FDOT Contact Us Maps & Data Offices Performance Projects

Roadway Design

Roadway Design / Roadway Criteria / FDOT Design Manual

FDOT Design Manual

Subscribe to our [FDOT Contact Management Subscription Service](#) to receive the most current notices, bulletins, memoranda, and other important information. Submit FDOT Design Manual (FDM) questions, comments, or suggestions by email to: [Mary Jane Hayden, P.E.](#)

2018 FDOT Design Manual
Plans Preparation Manual (PPM)

2019 FDOT Design Manual

To view the Implementation Bulletin for the current FDM, please see [RDB18-09](#)

Development and Processes - Complete FDM Part 1 (Available for download Jan 1, 2019)

Chapter	Bulletin	Webinar	Description
Introduction			
100			Introduction
Link			Context Classification
102			Glossary of Terms
103			Standard Forms
104			Public Involvement
105			Aesthetic Design
106			Exempt Public Documents
Plans Development Processes			
110			Initial Engineering Design Process
111			Final Engineering Design Process
112			Update Engineering Design Process
113			Right of Way Requirements
114			Resurfacing, Restoration, and Rehabilitation (RRR)
115			Standard Plans and Standard Specifications
116			Roundabout Evaluation (Evaluation Forms)
Plans Submittal, Review, and Processing			
120			Design Submittals
121			Bridge Project Development

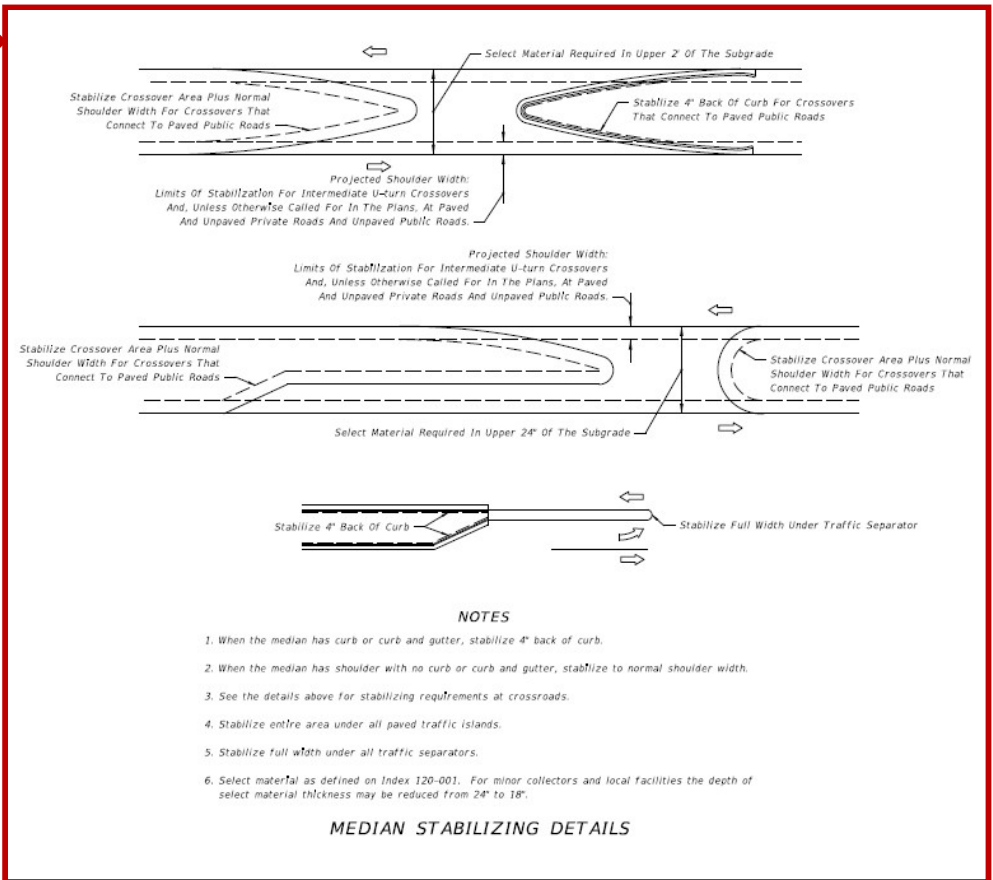
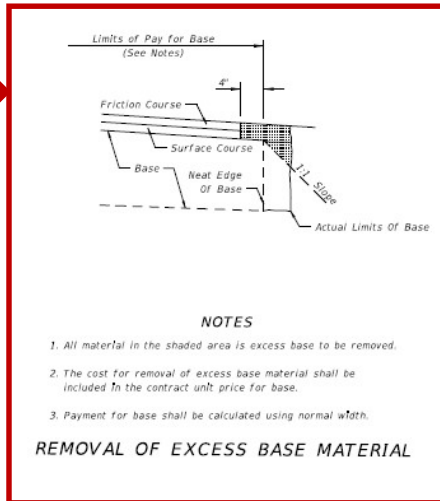
Standard Plans – Primary Updates:

- ✓ 1) *General Overview and Website*
- 2) *Misc. Indexes*
- ➔ a) *Index 000-506 - Miscellaneous Earthwork Details (Including: Indexes 160-001 & 120-001)*
- b) *Index 000-510 - Superelevation - High Speed Roadways*
- c) *Index 000-511 - Superelevation - Low Speed Roadways*
- d) *Index 000-515 - Turnouts and Driveways (Including: Indexes 522-003 & 330-001)*
 - *Index 000-516 - Turnouts - Resurfacing Projects*
- e) *Index 350-001 - Concrete Pavement Joints*
- f) *Index 522-001 - Concrete Sidewalk*
- g) *Index 522-002 - Detectable Warnings and Sidewalk Curb Ramps*
- h) *Misc. Traffic Control Signals and Devices (Including: Indexes 630-001, 634-002, 635-001, 659-010, 660-001, and 676-010)*

**Re-Indexed 160-001:
Stabilization Details**



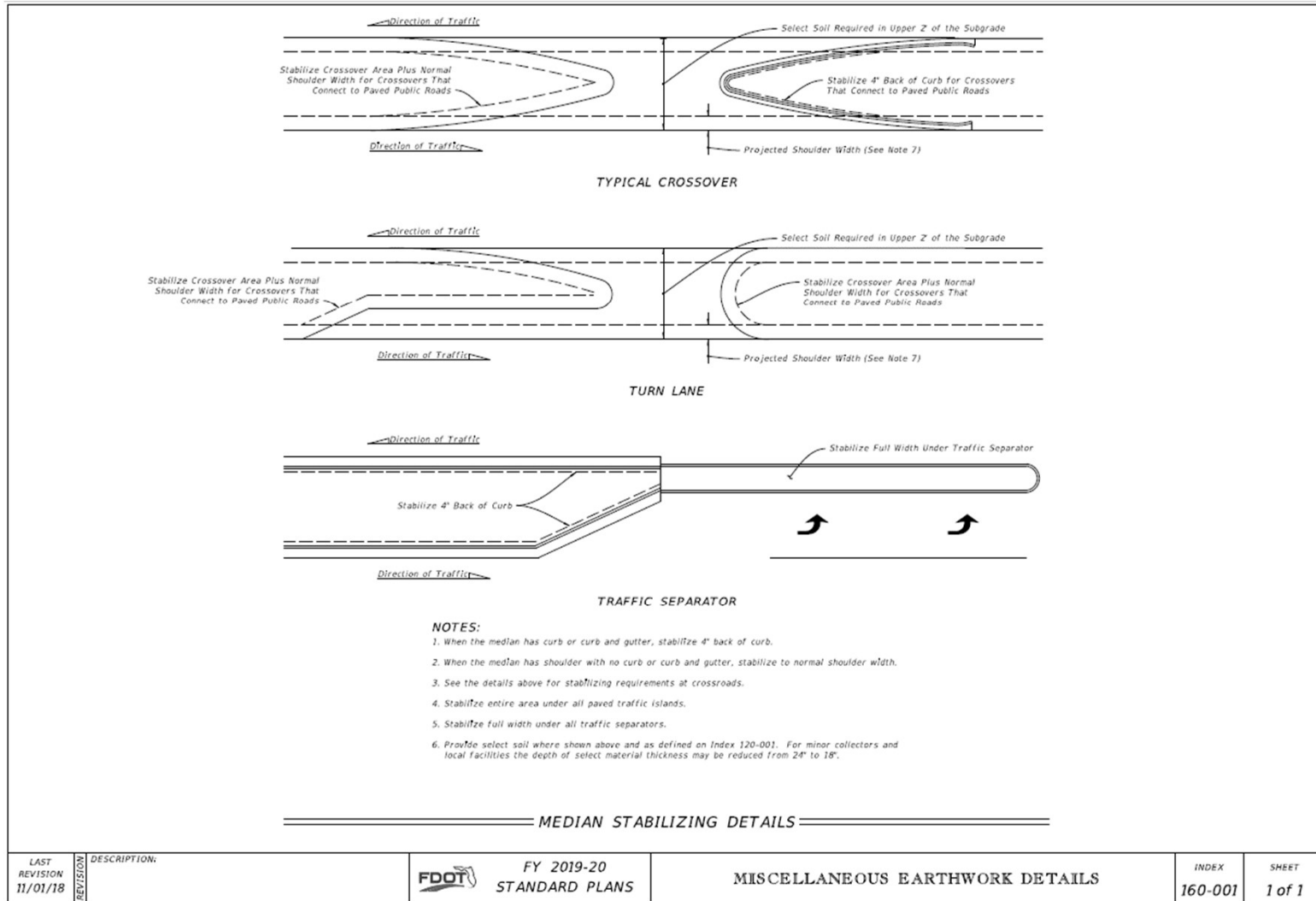
**Index 120-001:
Excess Base Materials
Information Relocated**



LAST REVISION 11/01/17	DESCRIPTION: REV 5/02	FY 2018-19 STANDARD PLANS	MISCELLANEOUS EARTHWORK DETAILS	INDEX 000-506	SHEET 1 of 1
---------------------------	--------------------------	------------------------------	---------------------------------	------------------	-----------------

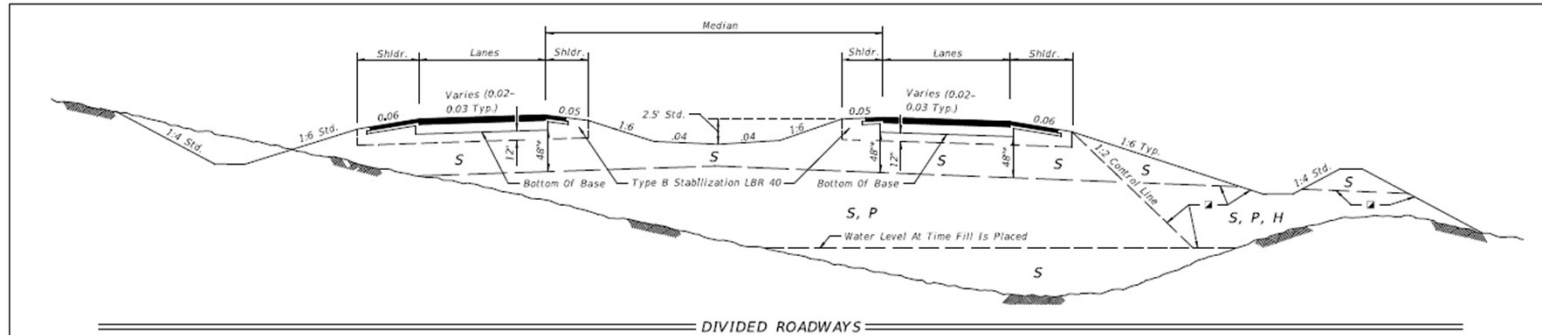
New Index 160-001: Median Stabilizing Details

Specification 160 (Stabilizing)



Updated:

- Layout Style
- General Notes

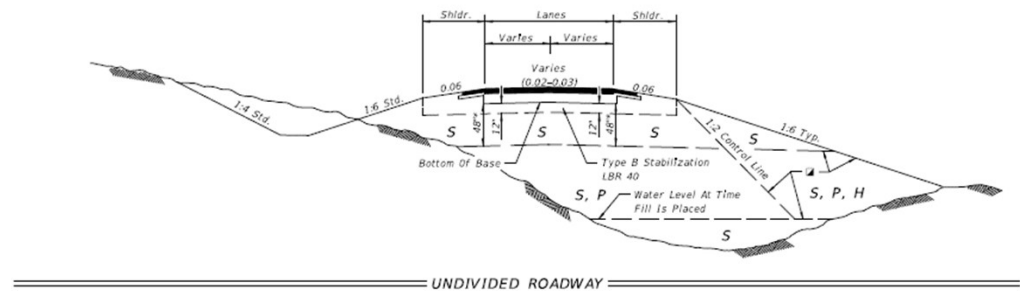


GENERAL NOTES:

- Roadway dimensions are representative. Subgrade dimensions and control lines are standard. The details shown on this Index do not supersede the details shown in the Plans or Indexes 120-002 and 160-001.
- Plastic (P) soils may be placed above the existing water level (at the time of construction) to within 4 feet of the proposed base. It should be placed uniformly in the lower portion of the embankment for some distance along the project rather than full depth for short distances.
- High Plastic (H) soils excavated within the project limits may be used in embankment construction as indicated on this Index. High Plastic soils are not to be used for embankment construction when obtained from outside the project limits.
- Select (S) soils having an average organic content of more than two and one-half (2.5) percent, or having an individual test value which exceeds four (4) percent, are not permitted in the subgrade portion of the roadbed. Select (S), Plastic (P), or High Plastic (H) soils having an average organic content of more than five (5) percent, or an organic content individual test result which exceeds seven (7) percent, are not permitted in the portion of embankment inside the control line, unless written authorization is provided by the District Geotechnical Engineer; these soils may be used for embankment construction outside the control line, unless restricted by the Plans or otherwise specified in the Plans, provided they can be compacted sufficiently to sustain a drivable surface for the duration of the project.

Three randomly selected samples from each stratum or stratum of a particular material. Perform tests in accordance with AASHTO T 267 on the portion of a sample passing the No. 4 sieve.

- Highly organic soils, composed primarily of partially decayed organic matter, often dark brown or black in color with an odor of decay, and sometimes fibrous, are designated as muck. Further, any stratum or stockpile of soil which contains pockets of highly organic material may be designated as Muck (M). Highly organic soils are not permitted within the subgrade or embankment portion of the roadbed.

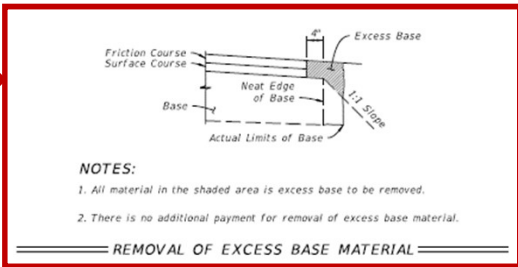


SYMBOL	SOIL	CLASSIFICATION (AASHTO M 145)
S	Select	A-1, A-3, A-2-4 **
P	Plastic	A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7 (ALL WITH LL < 50)
H	High Plastic	A-2-5, A-2-7, A-5 Or A-7 (ALL WITH LL > 50)
M	Muck	A-8

Classification listed left to right in order of preference.
 * See General Notes Nos. 4 & 5 for utilization of soils classified as organic material or muck.

** Certain types of A-2-4 material are likely to retain excess moisture and may be difficult to dry and compact. They should be used in the embankment above the water level existing at time of construction. They may be used in the subgrade portion of the roadbed when approved by the District Materials Engineer. A-2-4 material placed below the existing water level must be nonplastic and contain less than 15% passing the No. 200 U.S. Standard sieve.

* For cut sections this dimension may be reduced to 24"; see Index 120-002. For minor collectors and local facilities this dimension may be reduced to 18".



NOTES:

- All material in the shaded area is excess base to be removed.
- There is no additional payment for removal of excess base material.

REMOVAL OF EXCESS BASE MATERIAL

Removal of Excess Base Material

LAST REVISION	DESCRIPTION:
11/01/18	

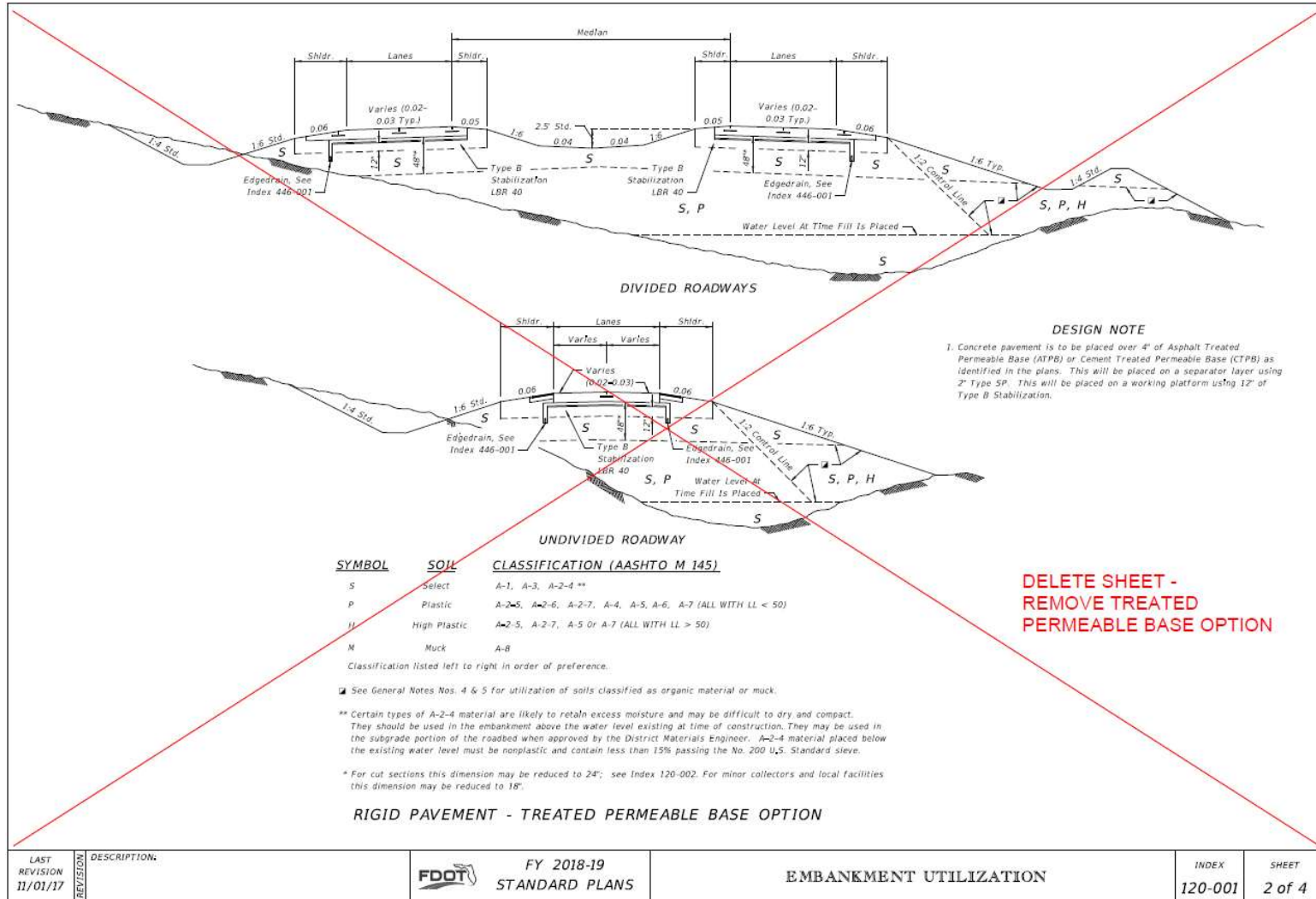
Removal of Treated Permeable Base Option

Departments Preference now:

- Asphalt Base
- Or
- Special Select Soils

Refer to:

Rigid Pavement Design Manual

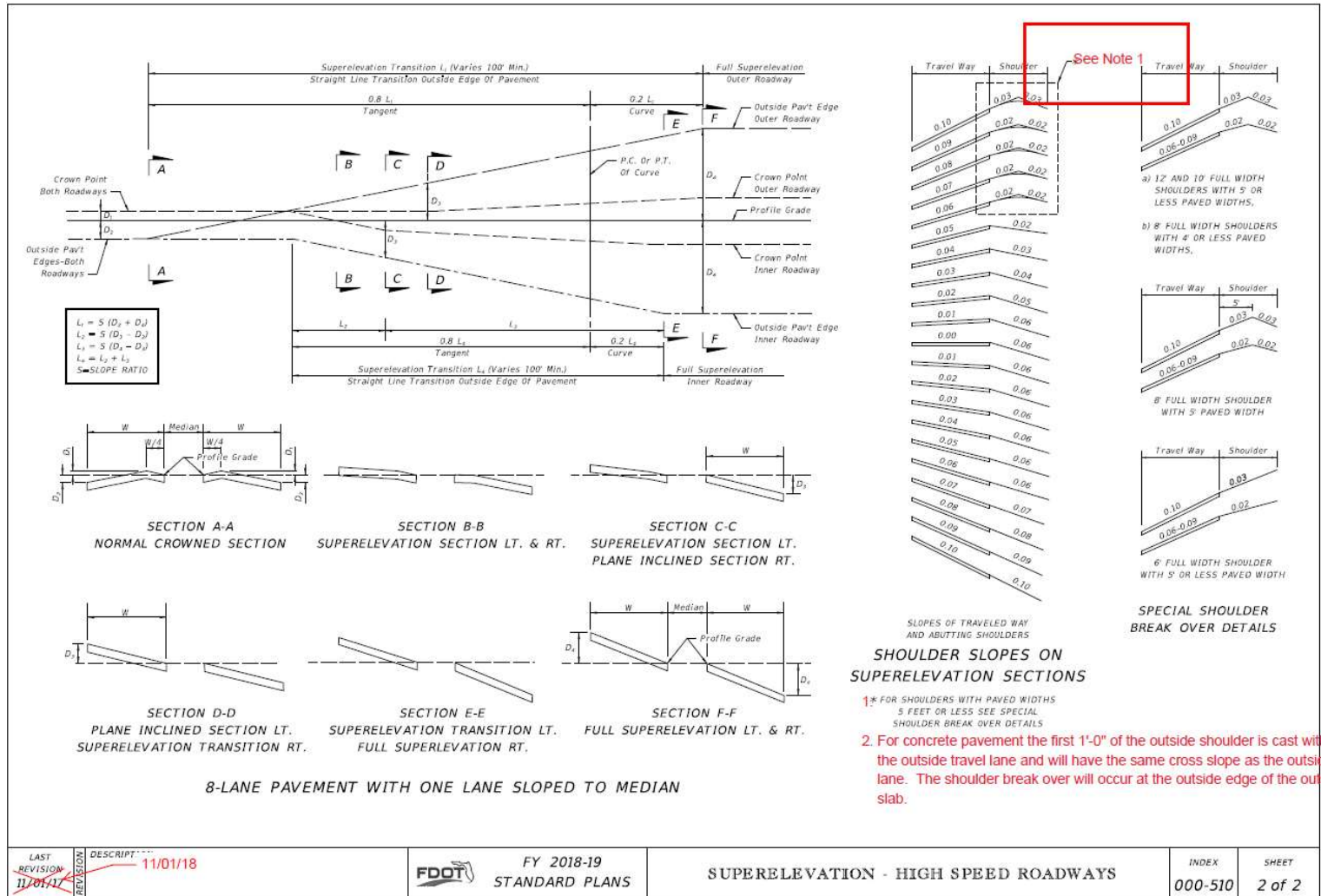


DELETE SHEET - REMOVE TREATED PERMEABLE BASE OPTION

Standard Plans – Primary Updates:

- ✓ 1) *General Overview and Website*
- 2) *Misc. Indexes*
 - ➡ a) *Index 000-506 - Miscellaneous Earthwork Details (Including: Indexes 160-001 & 120-001)*
 - b) *Index 000-510 - Superelevation - High Speed Roadways*
 - c) *Index 000-511 - Superelevation - Low Speed Roadways*
 - d) *Index 000-515 - Turnouts and Driveways (Including: Indexes 522-003 & 330-001)*
 - *Index 000-516 - Turnouts - Resurfacing Projects*
 - e) *Index 350-001 - Concrete Pavement Joints*
 - f) *Index 522-001 - Concrete Sidewalk*
 - g) *Index 522-002 - Detectable Warnings and Sidewalk Curb Ramps*
 - h) *Misc. Traffic Control Signals and Devices (Including: Indexes 630-001, 634-002, 635-001, 659-010, 660-001, and 676-010)*

Added Note for Location of Shoulder Break for Concrete Pavement



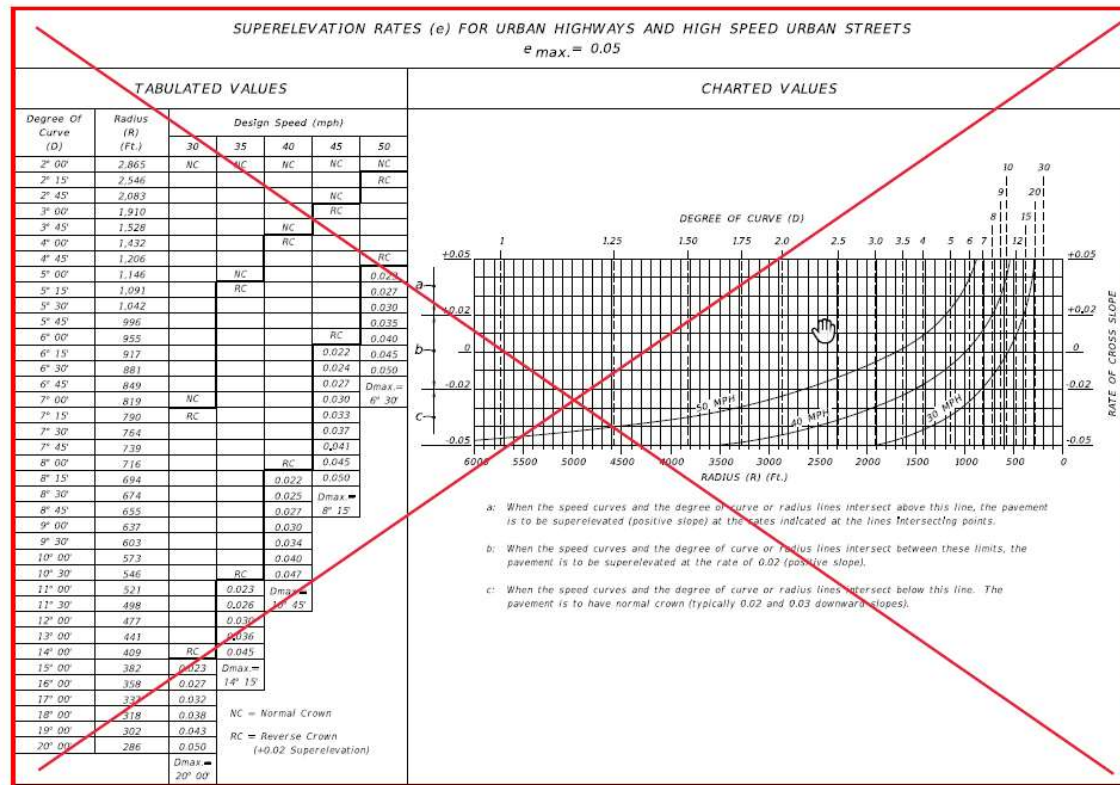
Standard Plans – Primary Updates:

- ✓ 1) *General Overview and Website*
- 2) *Misc. Indexes*
 - ✓ a) *Index 000-506 - Miscellaneous Earthwork Details (Including: Indexes 160-001 & 120-001)*
 - ➔ b) *Index 000-510 - Superelevation - High Speed Roadways*
 - c) *Index 000-511 - Superelevation - Low Speed Roadways*
 - d) *Index 000-515 - Turnouts and Driveways (Including: New Indexes 522-003 & 330-001)*
 - *Index 000-516 - Turnouts - Resurfacing Projects*
 - e) *Index 350-001 - Concrete Pavement Joints*
 - f) *Index 522-001 - Concrete Sidewalk*
 - g) *Index 522-002 - Detectable Warnings and Sidewalk Curb Ramps*
 - h) *Misc. Traffic Control Signals and Devices (Including: Indexes 630-001, 634-002, 635-001, 659-010, 660-001, and 676-010)*



Superelevations – Low Speed Roadways, Index 000-511

Removed Redundant Information Included in FDM 210.9



- GENERAL NOTES**
- Maximum rate of superelevation for urban highways and high speed urban streets shall be 0.05.
 - Superelevation shall be obtained by rotating the plane successively about the break points of the section until the plane has attained a slope equal to that required by the chart. Should the rotation traverse the entire section and further superelevation be required, the remaining rotation of the plane shall be about the low edge of the inside travel lane. Crown is to be removed in the adjoining travel lanes require positive superelevation. **Plans**
 - When positive superelevation is required, the slope of the gutter on the high side shall be a continuation of the slope of the superelevated pavement.
 - In construction, short vertical curves shall be placed at all angular profile breaks within the limits of the superelevation transition.
 - The variable superelevation transition length 'L' shall have a minimum value of 50 feet for design speeds under 40 MPH and 75 feet for design speeds of 40 MPH or greater.
 - Roadway sections having lane arrangements different from those shown, but composed of a series of planes, shall be superelevated in a similar manner.
 - For superelevation of lower speed urban streets, see the FDOT Manual of Uniform Minimum Standards For Design, Construction And Maintenance For Streets And Highways. For superelevation of curves on rural highways, urban freeways and high speed urban highways, see Index 000-510.

Moved to Sheet 2

DELETED SHEET

Standard Plans – Primary Updates:

- ✓ 1) *General Overview and Website*
- 2) *Misc. Indexes*
 - ✓ a) *Index 000-506 - Miscellaneous Earthwork Details (Including: Indexes 160-001 & 120-001)*
 - ✓ b) *Index 000-510 - Superelevation - High Speed Roadways*
 - ➔ c) *Index 000-511 - Superelevation - Low Speed Roadways*
 - d) *Index 000-515 - Turnouts and Driveways (Including: New Indexes 522-003 & 330-001)*
 - *Index 000-516 - Turnouts - Resurfacing Projects*
 - e) *Index 350-001 - Concrete Pavement Joints*
 - f) *Index 522-001 - Concrete Sidewalk*
 - g) *Index 522-002 - Detectable Warnings and Sidewalk Curb Ramps*
 - h) *Misc. Traffic Control Signals and Devices (Including: Indexes 630-001, 634-002, 635-001, 659-010, 660-001, and 676-010)*

Redevelopment Effort:

➤ Criteria vs Construction Information

- **e.g.: Geometric Requirements**
 - Connection Width
 - Flare Distance
 - Radial Return Radius
 - Setback
- **Definitions (i.e., Connection Categories)**
- **Florida Administrative Code (F.A.C.), R**
 - Maintenance vs. Permittee Responsibilities
 - Minimum Requirements

DESCRIPTION/PROJECTED AVERAGE VEHICLE TRIPS PER DAY OF SITE
Category A – Uses to 20 VTPD
Category B – Uses with 21 - 600 VTPD
Category C – Uses with 601 - 1,200 VTPD
Category D – Uses with 1,201 - 4,000 VTPD
Category E – Uses with 4,001 - 10,000 VTPD
Category F – Uses with 10,001 - 30,000 VTPD
Category G – Uses with 30,001 + VTPD

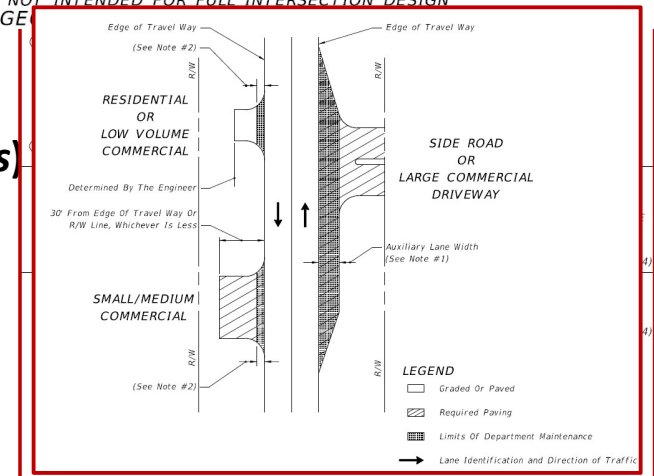
- **Index 522-003 (Concrete Driveways)**
- **Index 330-001 (Paved and Graded Driveways)**

ELEMENT DESCRIPTION	CURBED ROADWAYS			FLUSH SHOULDER ROADWAYS		
	1-20 Trips/Day or 1-5 Trips/Hour	21-600 Trips/Day or 6-60 Trips/Hour	601-4000 Trips/Day or 61-400 Trips/Hour	1-20 Trips/Day or 1-5 Trips/Hour	21-600 Trips/Day or 6-60 Trips/Hour	601-4000 Trips/Day or 61-400 Trips/Hour
		2-Way □	2-Way □		2-Way □	2-Way □
CONNECTION WIDTH W	12' Min. 24' Max.	24' Min. 36' Max. ☆	24' Min. 36' Max. ☆	12' Min. 24' Max.	24' Min. 36' Max. ☆	24' Min. 36' Max. ☆
FLARE (Drop Curb) F	10' Min.	10' Min.	N/A	N/A	N/A	N/A
RETURNS (Radius) R & U	N/A	△	25' Min. 50' Std. 75' Max.	15' Min. 25' Std. 50' Max.	25' Min. 50' Std. 75' Max.	25' Min. 50' Std. 75' Max. (Or 3-Centered Curves)
ANGLE OF DRIVE Y		60°-90°	60°-90°		60°-90°	60°-90°
DIVISIONAL ISLAND (Throat Median)		4'-22' Wide	4'-22' Wide		4'-22' Wide	4'-22' Wide
SETBACK G	12' Min., All categories. See General Note No. 5.					

■ Side road intersection design, with possible auxiliary lanes and channelization, may be necessary. Intersection design, with possible auxiliary lanes and channelization, should be considered for connections with more than 4000 trips/days.
 □ "2-Way" refers to one "in" movement and one "out" movement i.e., not exclusive left or right turn lanes on the connection.
 ☆ When more than 2 lanes in the turnout connection are required, the 36' max. width may be increased to relieve interference between entering and exiting traffic which adversely affects traffic flow. These cases require documented site specific study and design.
 △ Small radii may be used in lieu of flares as approved by the Department.
 DESIGN NOTE: 1-Way connections will be designed to effectively eliminate unpermitted movements.

NOT INTENDED FOR FULL INTERSECTION DESIGN
SUMMARY OF GEOMETRIC REQUIREMENTS

Driveways





Turnouts and Driveways, Old Indexes 000-515 & 000-516

Old SHEET 1 of 7:

Content Moved to
FDM 214

LEGEND

- Return Radius Point Or Flare Point
- Buffer Areas
- F.B. Line Frontage Boundary Line
- W Driveway Width
- Y Driveway Angle
- C Corner Clearance
- G Setback
- R Outside Radius
- U Inside Radius
- D Distance Between Connections
- F Flare

For Corner Clearance (C) Requirements see General Note 3.
For Additional Information Refer To FDOT Rules Chapters 14-96 And 14-97.

SKETCH ILLUSTRATING DEFINITIONS

ELEMENT DESCRIPTION	CURBED ROADWAYS			FLUSH SHOULDER ROADWAYS		
	1-20 Trips/Day or 1-5 Trips/Hour	21-600 Trips/Day or 6-60 Trips/Hour	601-4000 Trips/Day or 61-400 Trips/Hour	1-20 Trips/Day or 1-5 Trips/Hour	21-600 Trips/Day or 6-60 Trips/Hour	601-4000 Trips/Day or 61-400 Trips/Hour
CONNECTION WIDTH W	12' Min. 24' Max.	24' Min. 36' Max. Δ	24' Min. 36' Max. Δ	12' Min. 24' Max.	24' Min. 36' Max. Δ	24' Min. 36' Max. Δ
FLARE (Drop Curb) F	10' Min.	10' Min.	N/A	N/A	N/A	N/A
RETURNS (Radius) R & U	N/A	Δ	25' Min. 50' Std. 75' Max.	15' Min. 25' Std. 50' Max.	25' Min. 50' Std. 75' Max.	25' Min. 50' Std. (Or 3-Centered Curves)
ANGLE OF DRIVE Y		60°-90°	60°-90°		60°-90°	60°-90°
DIVISIONAL ISLAND (Throat Median)		4'-22' Wide	4'-22' Wide		4'-22' Wide	4'-22' Wide
SETBACK G	12' Min., All categories. See General Note No. 5.					

Δ Side road intersection design, with possible auxiliary lanes and channelization, may be necessary. Intersection design, with possible auxiliary lanes and channelization, should be considered for connections with more than 4000 trips/days.
 \square "2-Way" refers to one "in" movement and one "out" movement i.e., not exclusive left or right turn lanes on the connection.
 \star When more than 2 lanes in the turnout connection are required, the 36' max. width may be increased to relieve interference between entering and exiting traffic which adversely affects traffic flow. These cases require documented site specific study and design.
 Δ Small radii may be used in lieu of flares as approved by the Department.
 DESIGN NOTE: 1-Way connections will be designed to effectively eliminate unpermitted movements.

**NOT INTENDED FOR FULL INTERSECTION DESIGN
SUMMARY OF GEOMETRIC REQUIREMENTS FOR DRIVEWAY TURNOUTS**

GENERAL NOTES

- For definitions and descriptions of access connection categories and access classifications of highway segments and for other detailed information on access to the State Highway System refer to FDOT Rule Chapter 14-96, State Highway Connecting Permits Administration Rules Chapter 14-97, State Highway System Access Management Classification System And Standards.
- For this index the term turnout applies to that portion of driveways on side roads adjoining the outer roadway. For this index the term connection encompasses an driveway or side road and their appurtenant islands, separators, transition tapers, auxiliary lanes, travelway flares, drainage pipes and structures, crosswalks, sidewalks, curb cut ramps, signing, pavement markings, required signalization, maintenance of traffic, other means of access to or from controlled access facilities (the turnout requirements set forth in this index do not provide complete intersection design, construction or maintenance requirements).
- The location, positioning, orientation, spacing and number of connections and median openings shall be in conformance with FDOT Rule Chapter 14-97.
- On Department construction projects all driveways not shown on the plans shall be reconstructed at their existing location in conformance to these standards or in conformance to permits issued during the construction project.
- Driveways that have sufficient length and size for motor vehicle queuing, stacking, maneuvering, standing and parking to be carried out completely beyond the right-of-way line (except for vehicles stopping to enter the highway) the turnout areas and drives within the right-of-way shall be used only for motor vehicles entering and leaving the highway.
- Connections with expected daily traffic over 4000 ypd shall be constructed as intersecting side roads. The design requirements of this index and that of the local government will be used to select appropriate connection width, radii and intersection design, subject to the approval of the Department. For connections with expected daily traffic less than 4000 ypd the Department will determine the drop curb or radius return as required in accordance with existing plans.
- Connections with expected daily traffic over 4000 ypd shall be designed and constructed in accordance with the standards of this index and that of the local government, subject to the approval of the Department.
- For connections that are intended to safely accommodate either multi-unit vehicles or single-unit vehicles exceeding 30' in length, returns with 50' radii shall be used unless otherwise called for in the plans or otherwise stipulated by permits. Where large numbers of multi-unit vehicles will use the connection, the connection width and flare shall be increased and auxiliary lanes, separators and islands may be necessary to facilitate turning movements.
- An connection requiring or having a specified median opening with left turn storage and served directly by that opening shall have radii of returns.
- Where a connection is intended to align with a connection across the highway, the through lanes shall align directly with the corresponding through lanes.
- For new connections and for connections on all new construction and reconstruction projects, pavement materials and thicknesses shall meet the requirements applicable to either that detailed for "Curbed Roadway-Flared Turnouts", or that described in "Table 515-1" for connections with radial returns and/or auxiliary lanes.
- The responsibility for the cost of construction or alteration to an access connection shall be in accordance with FDOT Rule Chapter 14-96.

DESIGN NOTES

- Prior to the adoption of FDOT Rules Chapters 14-96 and 14-97, connections to the State Highway System were defined and permitted by Classes. Connections have been redefined by Categories under Rule 14-96, and the term "Class" has been applied to highway segments of the State Highway System as defined under Rule 14-97.

Old SHEET 6 of 7:

Content Covered in
F.A.C., Rule 14-96

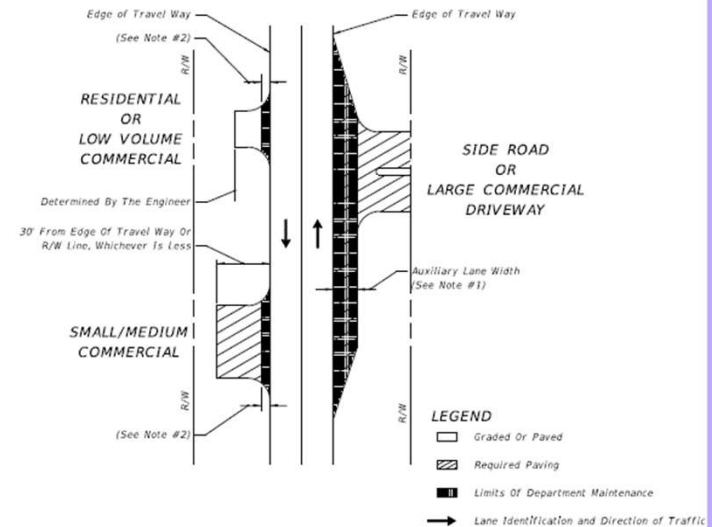
MATERIAL TYPES AND THICKNESSES IN DRIVING AREAS FOR ALL CONNECTIONS			
Course	Materials ①	Thickness (in.) ②	
		Connections ③	Roadway ④
Structural	Asphaltic Concrete	1'	1½'
Bases	Optional Base (See Spec. Section 285)	O.B.G. 1	O.B.G. 3

① Minimum thickness.
 ② All materials shall be approved by the Department prior to being placed.
 ③ Connection structure other than traffic lanes. See Notes 1 and 2 below.
 ④ Travel way flares (bypass lanes), auxiliary lanes serving more than a single connection, and all median crossovers including their auxiliary lanes and/or transition tapers. See Notes 1 and 2 below.

NOTES

- The pavement should be structurally adequate to meet the expected traffic loads and should not be less than that shown above, except as approved by the Department for graded connections. Other Department-approved equivalent pavements may be used at the discretion of the Engineer.
- Auxiliary lanes and their transition tapers shall be the same structure as the abutting travel way pavement thickness or any of the roadway structures tabulated above, whichever is thicker.
- If an asphalt base course is used for a turnout, its thickness may be increased to match the edge of travel way pavement thickness in lieu of a separate structural course. 6" of Portland cement concrete will be acceptable in lieu of the asphalt base and structural courses. See Notes 4 and 5 below.
- A structural course is required for flexible pavements when they are used for auxiliary lanes serving more than a single connection.
- Connections paved with Portland cement concrete shall be Class NS concrete at least 6" thick. The Department may require greater thickness when called for in the plans or stipulated by permit. Materials and construction shall conform with FDOT Standard Specifications Sections 347, 350 and 522.
- The Department may require other pavement criteria where local conditions warrant.

PAVEMENT STRUCTURE FOR TURNOUTS AND AUXILIARY LANES
TABLE 515-1



- NOTES**
- Auxiliary lane pavements and crossover pavements shall be maintained by the Department.
 - Department maintenance of turnout pavement extends 5' from edge of the travel way or to the edge of paved shoulder, whichever is greater. The remainder of any turnout paved area on the right of way shall be maintained by the owner or his authorized agent. As a function of routinely reworking shoulders, the Department may grade and shape existing material on nonpaved areas beyond the maintained pavement.
 - Control and maintenance of drainage facilities within the right of way shall be solely the responsibility of the Department, unless specified differently by Department permit.
 - The maintenance and operation of highway lighting, traffic signals, associated equipment and other necessary devices shall be the responsibility of a public agency.
 - All pavement markings on the State highways, including acceleration and deceleration lane markings, and signing installed for the operation of the State highway shall be maintained by the Department.
 - All signing and marking installed for the operation of the connection (such as stop bars and stop signs for the connection) shall be the responsibility of the permittee.

LIMITS OF CONSTRUCTION AND MAINTENANCE FOR FLUSH SHOULDER ROADWAY CONNECTIONS



Turnouts and Driveways, Old Indexes 000-515 & 000-516

Old SHEET 7 of 7:

Content Moved to
FDM 214

FLUSH SHOULDER ROADWAY - TURNOUT PROFILES

Definitions
 G-Grade (%)
 A- Algebraic Difference In Grades (%)
 L- Transition (See Tabulated Lengths)
 A \leq 14%- Transition Not Required
 A > 14%- Straight Or Rounded Transition Required

Maximum Grades
 Commercial=10%
 Residential=28%

CURBED ROADWAY - TURNOUT PROFILES

Definitions
 G-Grade (%)
 A- Algebraic Difference In Grades (%)
 L- Transition (See Tabulated Lengths)
 A \leq 14%- Transition Not Required
 A > 14%- Straight Or Rounded Transition Required

Maximum Grades
 Commercial=10%
 Residential=28%

STORMWATER RUNOFF AND PROFILE OPTION NOTES

1. Turnouts shall neither cause water to flow on or across the roadway pavement, nor cause water ponding or erosion within the State right of way. In all Flush Shoulder Roadway turnouts the transition (L) nearest the roadway shall be sloped or crowned to direct stormwater runoff to the roadside ditch. Inlets, flumes or other appropriate runoff control devices shall be constructed when runoff volumes are sufficient to cause erosion of the shoulder. Similar runoff control devices shall be constructed as necessary to properly direct and control the stormwater runoff on Curbed Roadway turnouts.
2. The Option 1 profile is intended for locations where roadway, turnout taper and auxiliary lane stormwater runoff volumes are relatively large. The Option 2 profile is intended for locations where runoff volumes are relatively small and/or where there is no roadside ditch.

RECOMMENDED TURNOUT PROFILE TRANSITION LENGTHS (L) (FT.)

A	LENGTHS (L) (FT.)							
	CRESTS				SAGS			
	STRAIGHT		ROUNDED		STRAIGHT		ROUNDED	
	Desirable	Minimum	Desirable	Minimum	Desirable	Minimum	Desirable	Minimum
6-13%	3	0	5	0	3	0	5	0
14%	3	0	10	0	3	0	10	0
15%	3	2.5	10	3	5	3	10	5
16%	5	3	10	4	6	4	10	6
17%	6	3.5	10	5	8	5	10	7
18%	6	4	10	6	9	6	10	8
19%	7	4.5	10	7	11	7	12	9
20%	8	5	11	8	12	8	13	10
21%	9	5.5	12	9	13	8.5	14	11
22%	10	6	13	10	14	9	16	12
23%	10	6.5	14	10.5	14	9.5	16	12.5
24%	11	7	15	11	15	10	17	13
25%	12	7.5	15	11.5	16	10.5	18	13.5
26%	12	8	16	12	17	11	18	14
27%	13	8.5	17	12.5	17	11.5	19	14.5
28%	14	9	17	13	18	12	20	15
29%	NA	NA	22	14	NA	NA	21	17
30-31%	NA	NA	23	15	NA	NA	22	18
32-33%	NA	NA	24	16	NA	NA	23	20
34-36%	NA	NA	26	17	NA	NA	25	21
37-38%	NA	NA	27	18	NA	NA	26	22
39-41%	NA	NA	29	19	NA	NA	28	24
42-43%	NA	NA	30	20	NA	NA	29	25
44-46%	NA	NA	32	21	NA	NA	31	26
47-48%	NA	NA	33	22	NA	NA	32	27
49-51%	NA	NA	34	23	NA	NA	34	28
52-54%	NA	NA	36	24	NA	NA	35	30
55-56%	NA	NA	37	25	NA	NA	36	31

Rounded: Either circular, parabolic, or spline curvature. The plans or the Engineer may specify a particular type of curvature.
 Desirable: Desirable minimum lengths (Greater lengths than minimum and desirable are recommended where practical for flatter and smoother profile.)
 Minimum: Absolute minimum lengths

ROADWAY PAVEMENT SLOPES AND SLOPES OF ABUTTING FLUSH SHOULDER ROADWAY TURNOUT SURFACES (G₂) SUPERELEVATION SECTIONS

(Already included on Index 000-510)

LAST REVISION 11/01/17	DESCRIPTION:		FY 2018-19 STANDARD PLANS
TURNOUTS AND DRIVEWAYS			INDEX 000-515
			SHEET 7 of 7

SHEET 1 of 4:

Formatted to Resemble
Index 522-002 for Curb
Ramps

Construction
Information from
Sheet 2 of
Old Index 000-515

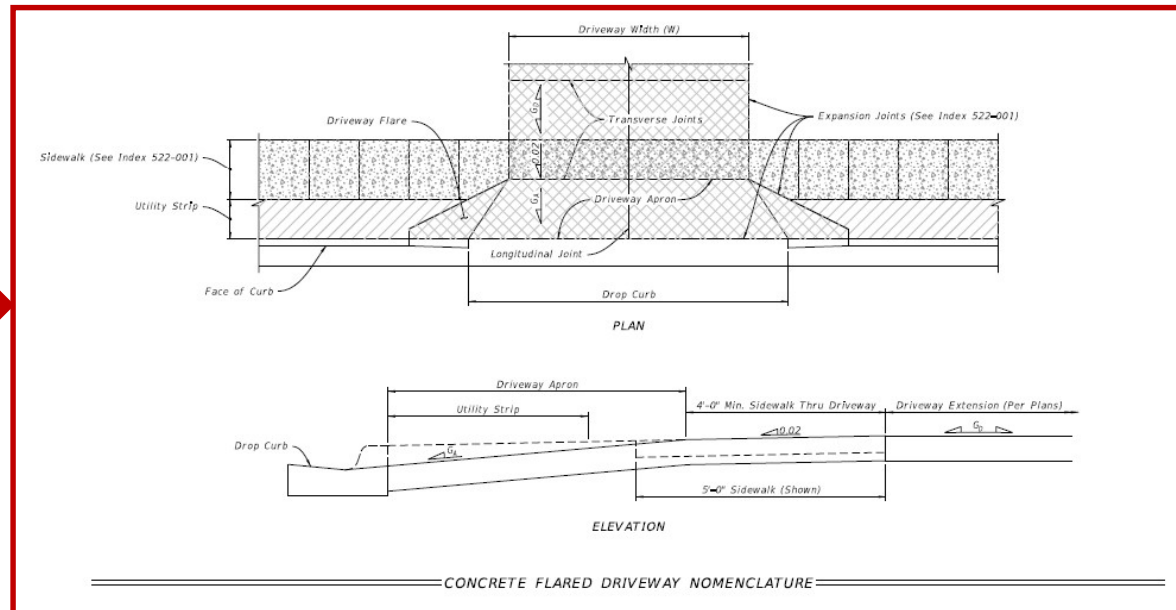
Added Nomenclature
Drawings to Define
Components

GENERAL NOTES:

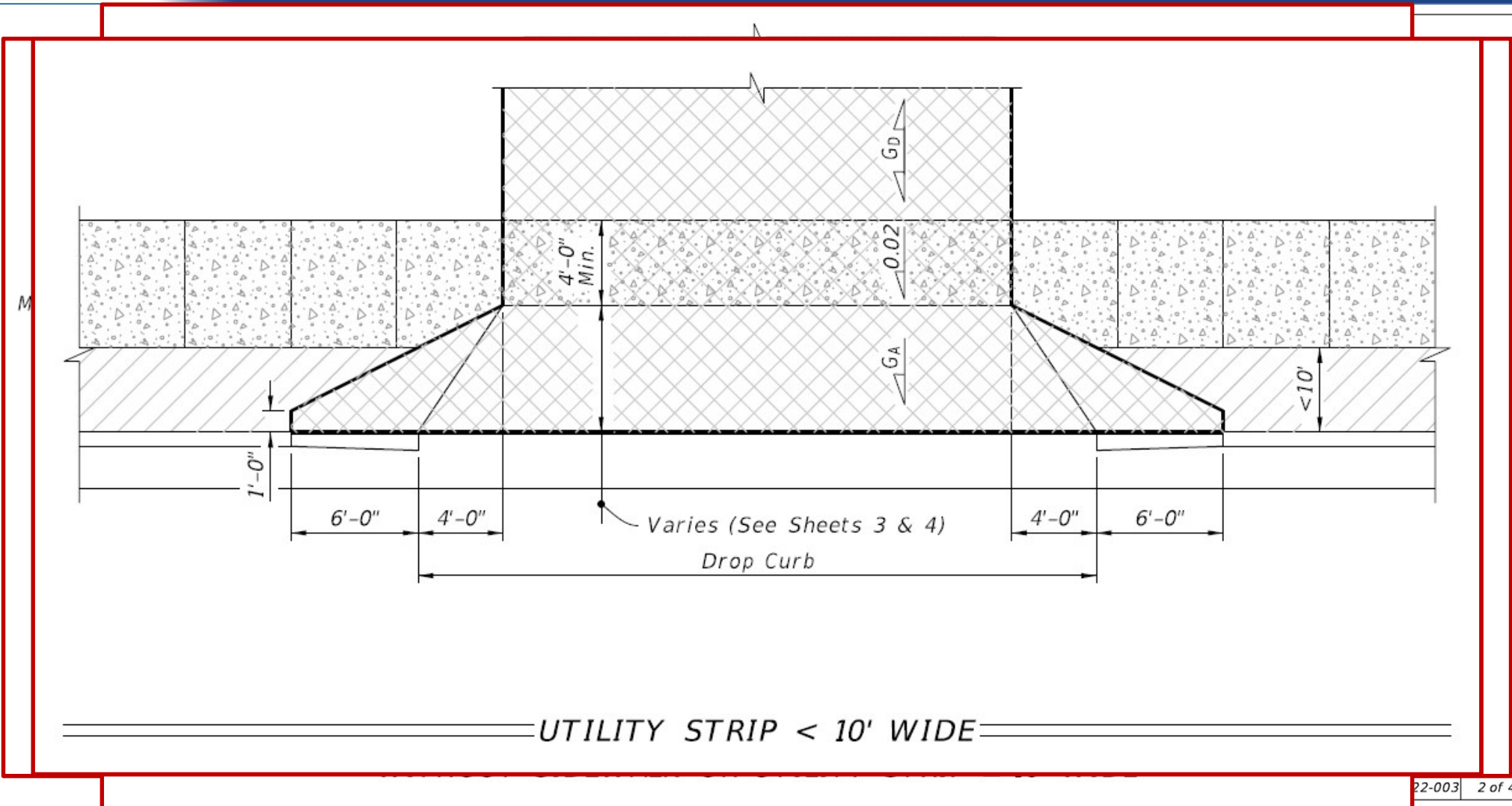
1. Work this Index with Specification 522.
2. Refer to Index 520-001 for drop curb details and Index 522-001 for joints between driveway, sidewalks, and curb.
3. Existing Curb and Gutter:
Remove existing curb and gutter to either the nearest joint beyond the flared point or to where no remaining section is less than 5 feet long.
4. Grades and cross slopes shown are maximums.
5. Longitudinal Joints:
Construct $\frac{1}{8}$ " open joints placed at equal (20' max.) intervals for driveways over 20' wide. Match joints in curb and gutter to match joints in driveways.
6. Transverse Joints:
Construct $\frac{1}{8}$ " open joints @ 10' Centers and $\frac{1}{2}$ " expansion joints with preformed joint filler every 5th joint.
7. Construct driveways (6" thick concrete) to a uniform width (W) to the R/W line or the extent shown in the Plans.
8. Width of Sidewalk Thru Driveway is 4'-0" minimum. Match sidewalk width when shown in Plans or when utility strip width is equal to or greater than the depth of the Driveway Apron.
9. Alpha-Numeric Identification:
Concrete Flared Driveway Alpha-Numeric Identifications (e.g. G4) are provided for reference purposes in the Plans.

LEGEND:

- Sidewalk
- Flared Driveway (6" Thick Concrete)
- Sidewalk Thru Driveway (6" Thick Concrete)
- Utility Strip
- G_A Grade of Apron
- G_D Grade of Driveway (Per Plans)



LAST REVISION 11/01/18	REVISION	DESCRIPTION:		FY 2019-20 STANDARD PLANS	CONCRETE FLARED DRIVEWAYS	INDEX 522-003	SHEET 1 of 4
---------------------------	----------	--------------	--	------------------------------	---------------------------	------------------	-----------------





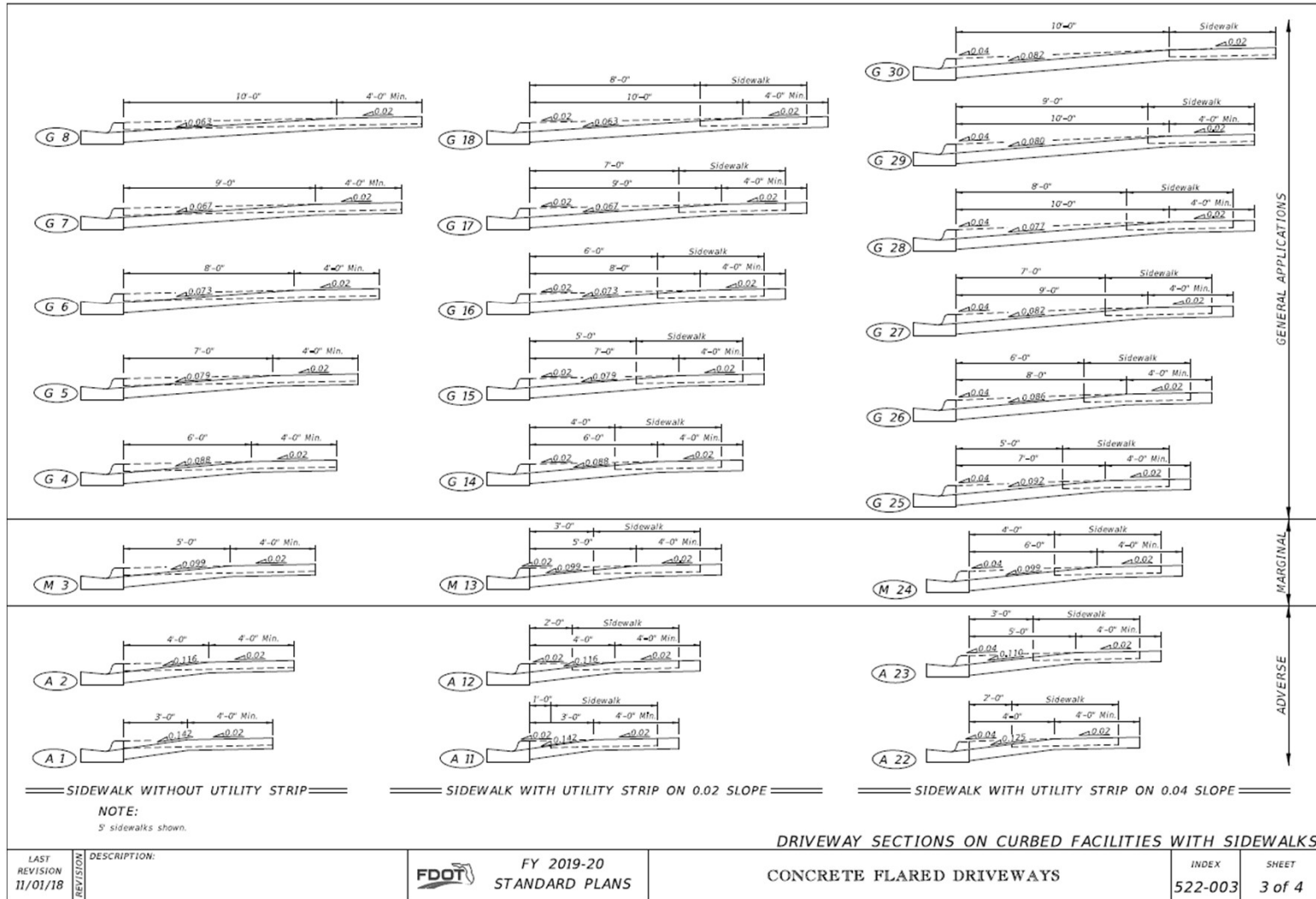
NEW - Concrete Flared Driveways, Index 522-003

SHEET 3 of 4:

Typical Driveway Profiles: Alpha-Numeric Identifications

Details from Old Index 000-515

Sheet 4 of 4 Similar



LAST REVISION	DESCRIPTION:
11/01/18	

FDOT	FY 2019-20
	STANDARD PLANS

INDEX	SHEET
522-003	3 of 4

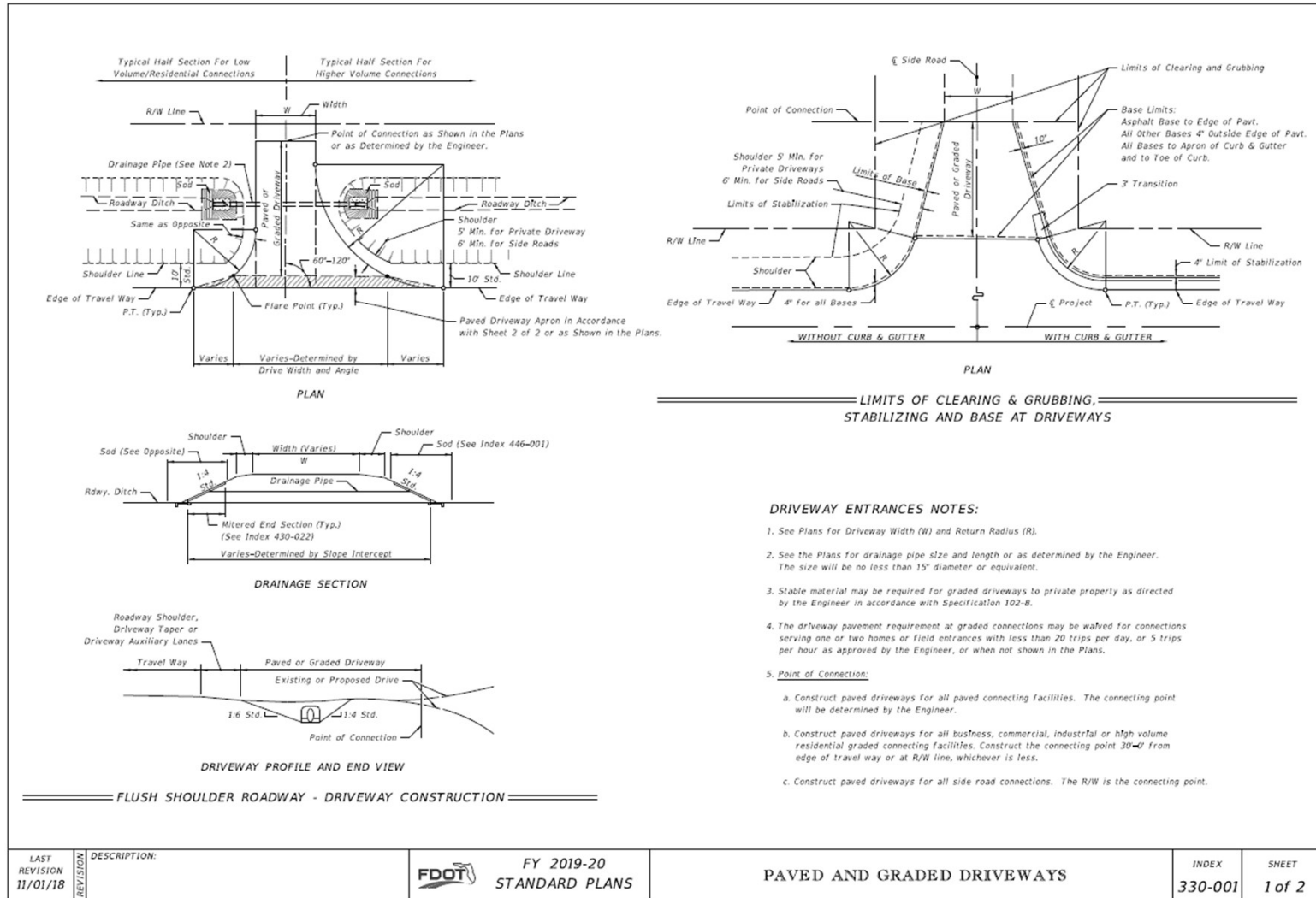
DRIVEWAY SECTIONS ON CURBED FACILITIES WITH SIDEWALKS	
CONCRETE FLARED DRIVEWAYS	

SHEET 1 of 2:

**Relocated Information
Relating to Paved and
Graded Driveways
From Indexes 000-515
and 000-516**

**Construction
Information from
Sheet 5 of
Old Index 000-515**

**Updated Notes to
Remove Construction
Phase Discussion
Making**



LAST REVISION 11/01/18	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	PAVED AND GRADED DRIVEWAYS	INDEX 330-001	SHEET 1 of 2
---------------------------	--------------	------	------------------------------	----------------------------	------------------	-----------------

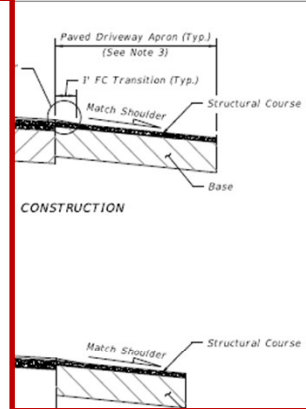
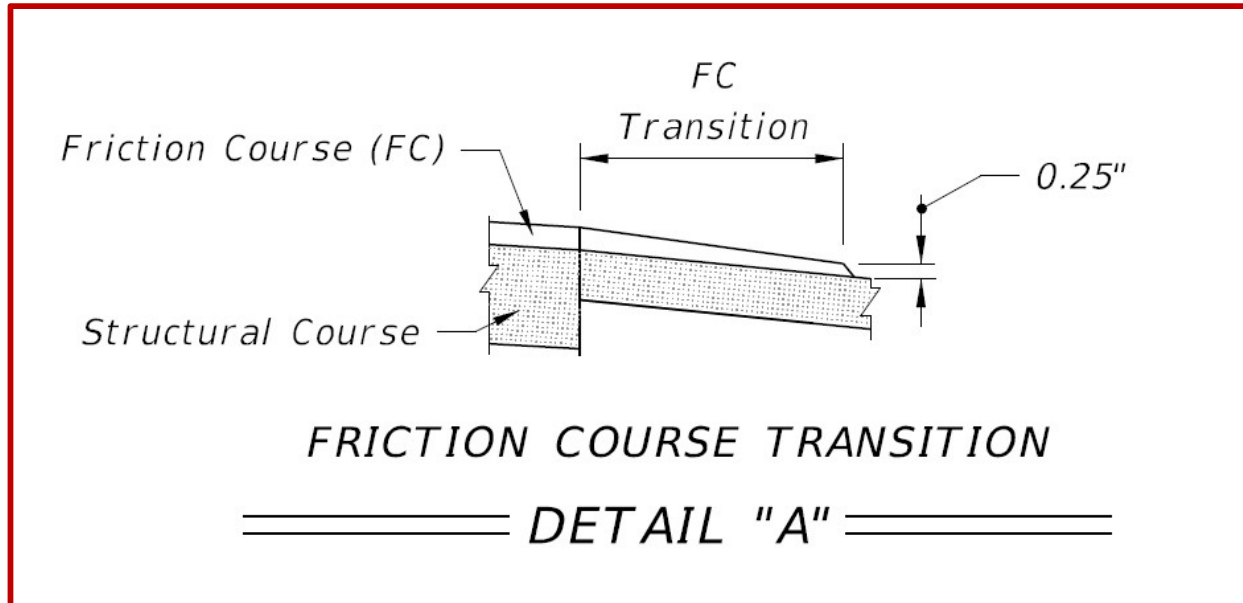
SHEET 2 of 2:

Construction Information from Old Index 000-516

Updated Material Requirements to Work for New Construction and Resurfacing Projects

Updated Cross-Sections

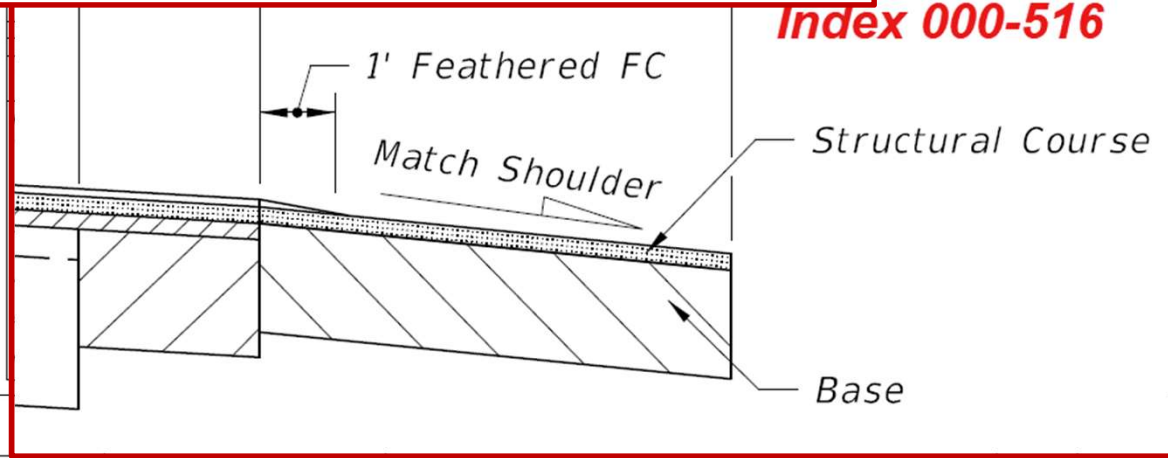
Added NEW Friction Course Transition Detail (DETAIL 'A')



Old Index 000-516

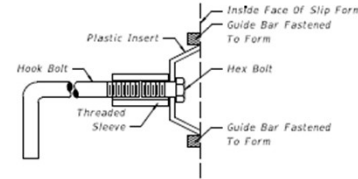
(ft.)	Type I	Type II	Type I	Type II
12	26	51	31	60
14	27	52	33	61
16	28	53	34	62
18	29	54	35	64
20	31	55	37	65
22	32	56	38	67
24	33	57	39	68
26	34	58	40	69
28	35	59	42	70
30	36	61	43	72
32	37	62	44	73
34	38	63	46	74
36	39	64	47	76
38	41	65	48	77
40	42	66	49	78
42	43	67	51	79
44	44	68	52	81
46	45	69	53	82
48	46	71	55	83
50	47	72	56	85
52	48	73	57	86
54	49	74	58	87
56	51	75	60	88
58	52	76	61	90
60	53	77	62	91

REVISION	DESCRIPTION
LAST REVISION 11/01/18	



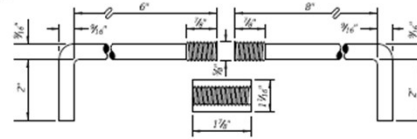
Standard Plans – Primary Updates:

- ✓ 1) *General Overview and Website*
- 2) *Misc. Indexes*
 - ✓ a) *Index 000-506 - Miscellaneous Earthwork Details (Including: Indexes 160-001 & 120-001)*
 - ✓ b) *Index 000-510 - Superelevation - High Speed Roadways*
 - ✓ c) *Index 000-511 - Superelevation - Low Speed Roadways*
 - ➔ d) *Index 000-515 - Turnouts and Driveways (Including: New Indexes 522-003 & 330-001)*
 - *Index 000-516 - Turnouts - Resurfacing Projects*
 - e) *Index 350-001 - Concrete Pavement Joints*
 - f) *Index 522-001 - Concrete Sidewalk*
 - g) *Index 522-002 - Detectable Warnings and Sidewalk Curb Ramps*
 - h) *Misc. Traffic Control Signals and Devices (Including: Indexes 630-001, 634-002, 635-001, 659-010, 660-001, and 676-010)*

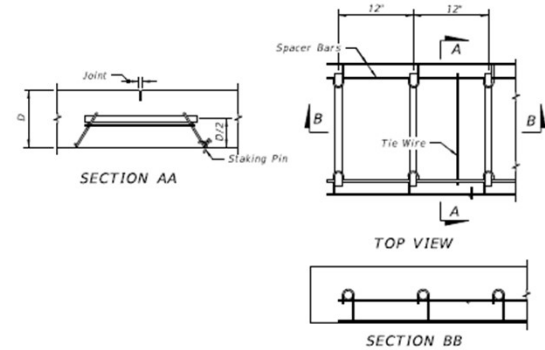


Note: After the concrete has set to the extent that the Keyway will retain its shape, the hex bolt and plastic insert shall be removed. The remaining portion of the hook bolt assembly shall be installed immediately prior to placing of concrete in the adjacent lane.

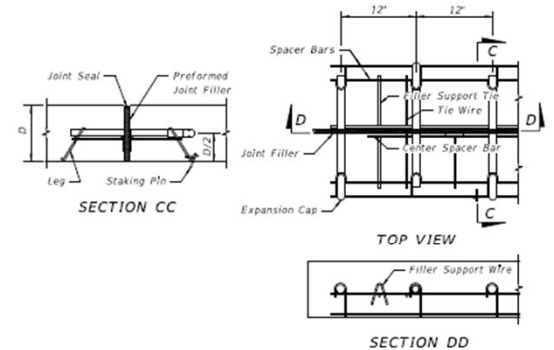
ALTERNATE KEYWAY AND HOOK BOLT
STEEL HOOK BOLT ASSEMBLY



Anchor bolts shall be Grade C in accordance with ASTM A 307.
Threaded sleeves shall develop the full strength of the bolt and meet the material and thread requirements of ASTM A 563.



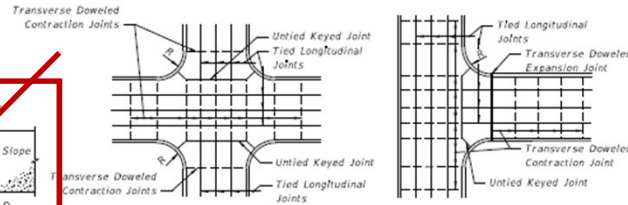
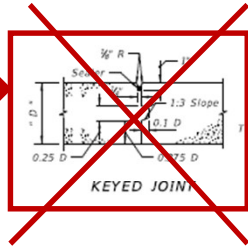
CONTRACTION ASSEMBLY



EXPANSION ASSEMBLY

Note: Proprietary contraction and expansion assemblies may be used. Products shall be introduced to the State Construction Office in accordance with section (C) of the Product Evaluation Procedure.

Deleted Keyed Joint



JOINT LAYOUT AT THRU INTERSECTION
JOINT LAYOUT AT 'T' INTERSECTIONS

JOINT ARRANGEMENT

NOTES

1. Longitudinal joints will not be required for single lane pavement 14' or less in width. For entrance and exit ramp joint details, see Sheet 4.
2. Arrangement of longitudinal joints are to be as directed by the Engineer.
3. All manholes, meter boxes and other projections into the pavement shall be boxed-in with 1/2" preformed expansion joint material.

LAST REVISION 11/01/17	DESCRIPTION:	FDOT	FY 2018-19 STANDARD PLANS	CONCRETE PAVEMENT JOINTS	INDEX 350-001	SHEET 3 of 4
---------------------------	--------------	------	------------------------------	--------------------------	------------------	-----------------

Standard Plans – Primary Updates:

- ✓ 1) *General Overview and Website*
- 2) *Misc. Indexes*
 - ✓ a) *Index 000-506 - Miscellaneous Earthwork Details (Including: Indexes 160-001 & 120-001)*
 - ✓ b) *Index 000-510 - Superelevation - High Speed Roadways*
 - ✓ c) *Index 000-511 - Superelevation - Low Speed Roadways*
 - ✓ d) *Index 000-515 - Turnouts and Driveways (Including: New Indexes 522-003 & 330-001)*
 - *Index 000-516 - Turnouts - Resurfacing Projects*
 - ➡ e) *Index 350-001 - Concrete Pavement Joints*
 - f) *Index 522-001 - Concrete Sidewalk*
 - g) *Index 522-002 - Detectable Warnings and Sidewalk Curb Ramps*
 - h) *Misc. Traffic Control Signals and Devices (Including: Indexes 630-001, 634-002, 635-001, 659-010, 660-001, and 676-010)*

SHEET 1 of 2:

Added Curb Inlets to Examples

Clarified Intent of Expansion Joint Locations

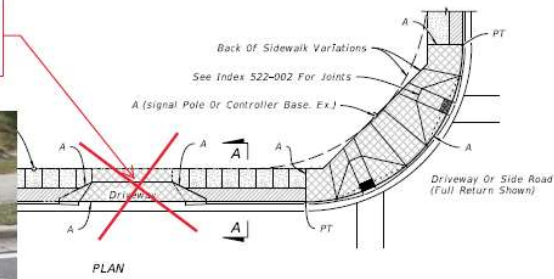
Revised: Specification 522

GENERAL NOTES:

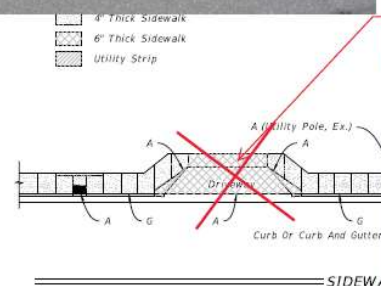
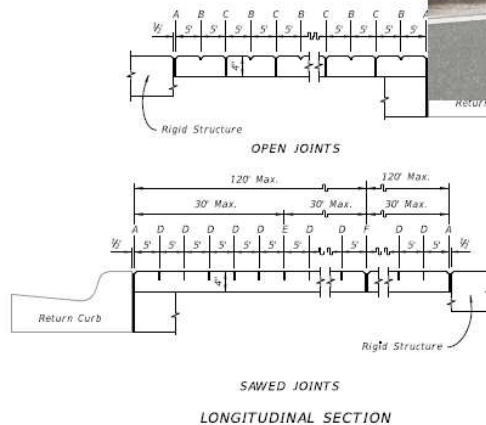
- Construct sidewalks in accordance with Specification 522. Use 6" concrete for Sidewalks and Curb Ramps Located within Curb Returns (See Plan View). Install all other concrete with thickness as shown, unless otherwise detailed in the Plans.
- Include detectable warnings on sidewalk curb ramps in accordance with Index 522-002.
- For TURNOUTS see Index 000-515.
- Bond breaker material can be any impermeable coated or sheet membrane having a thickness of not less than 6 mils not more than 1/2".
- Construct sidewalks with Edge Beam through the limits of any surface Railing or Pipe GuideRail shown in the plans. (See RAILING DETAILS)
- When roadways or driveways are built constructed concurrently:
 - Max. 0.05 cross slope for roadways or driveways controlled by traffic.
 - Max. 0.05 cross slope for roadways or driveways controlled by traffic.



Remove Driveway & add Curb Inlet Type 2 w/ 'A' Joint between sidewalk

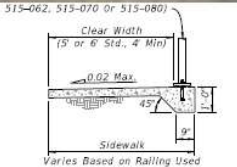
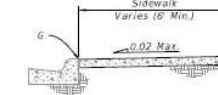
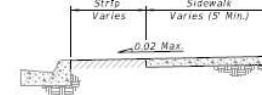


Remove Driveway & add Curb Inlet Type 6 w/ 'A' Joint between sidewalk



LEGEND:

- A- 1/2" Expansion Joints (Preformed Joint Filler) between the sidewalk and driveways, sidewalk-intersections, and all other fixed objects (e.g. drainage inlets and utility poles).
- B- 1/2" Dummy Joints, Tooled
- C- 1/2" Formed Open Joints
- D- 3/4" Saw Cut Joints, 1 1/2" Deep (within 96 hours) Max. 5' Centers
- E- 3/8" Saw Cut Joints, 1 1/2" Deep (within 12 hours) Max. 30' Centers Joint(s) Required When Length Exceeds 30'
- F- 1/2" Expansion Joint When Run Of Sidewalk Exceeds 120'. Intermediate locations when called for in the plans or at locations as directed by the Engineer.
- G- Cold Joint With Bond Breaker, Toolled



GENERAL NOTES AND CONCRETE SIDEWALK ON CURBED ROADWAYS

LAST REVISION 11/01/17	DESCRIPTION:	FDOT	FY 2018-19 STANDARD PLANS	CONCRETE SIDEWALK	INDEX 522-001	SHEET 1 of 2
---------------------------	--------------	------	------------------------------	-------------------	------------------	-----------------

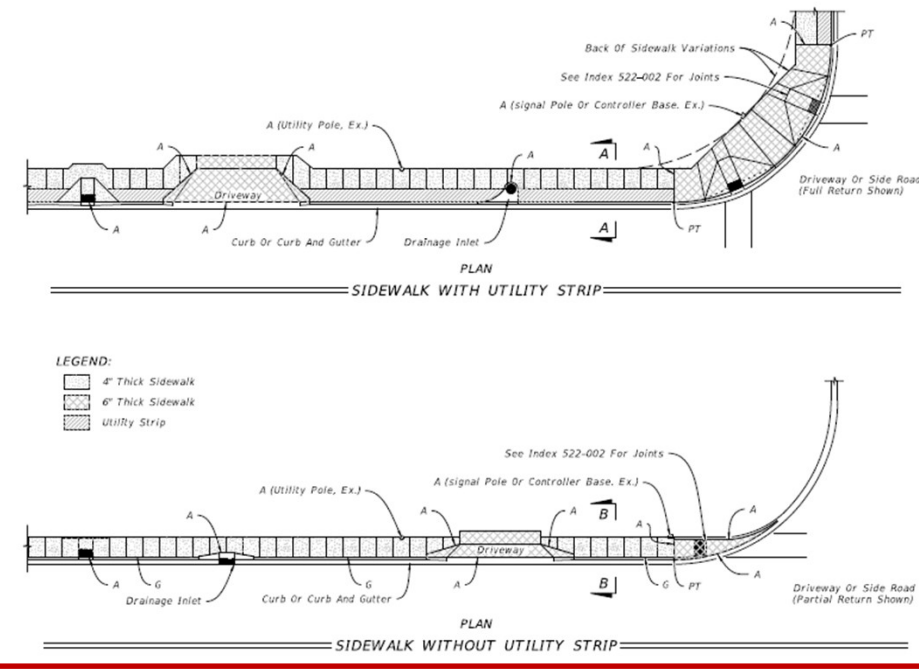
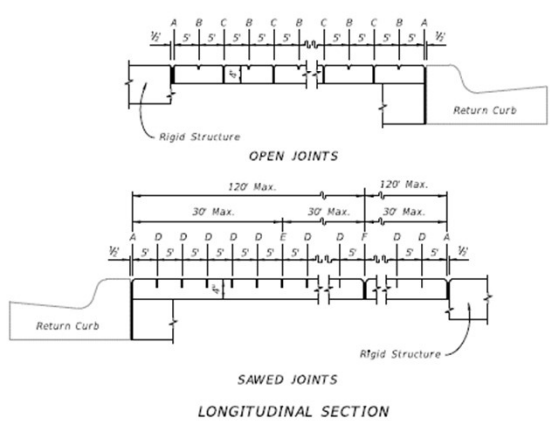
SHEET 1 of 2:

Added Curb Inlets to Examples

Clarified Intent of Expansion Joint Locations

GENERAL NOTES:

1. Construct sidewalks in accordance with Specification 522. Use 6" concrete for Sidewalks and Curb Ramps located within Curb Returns (See Plan View). Install all other concrete with thickness as shown, unless otherwise detailed in the Plans.
2. Include detectable warnings on sidewalk curb ramps in accordance with Index 522-002.
3. For Driveways see Index 522-003.
4. Bond breaker material can be any impermeable coated or sheet membrane or preformed material having a thickness of not less than 6 mils not more than 1/8".



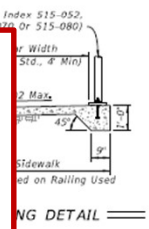
LEGEND:

A- 1/2" Expansion Joints (Preformed Joint Filler) between the sidewalk and; driveways, sidewalk-intersections, and all other fixed objects (e.g. drainage inlets and utility poles).

G- Cold Joint With Bond Breaker, Tooled

GENERAL NOTES AND CONCRETE SIDEWALK ON CURBED ROADWAYS

LAST REVISION 11/01/18	DESCRIPTION:	FDOT FY 2019-20 STANDARD PLANS	CONCRETE SIDEWALK	INDEX 522-001	SHEET 1 of 2
---------------------------	--------------	--------------------------------------	-------------------	------------------	-----------------



Standard Plans – Primary Updates:

- ✓ 1) *General Overview and Website*
- 2) *Misc. Indexes*
 - ✓ a) *Index 000-506 - Miscellaneous Earthwork Details (Including: Indexes 160-001 & 120-001)*
 - ✓ b) *Index 000-510 - Superelevation - High Speed Roadways*
 - ✓ c) *Index 000-511 - Superelevation - Low Speed Roadways*
 - ✓ d) *Index 000-515 - Turnouts and Driveways (Including: New Indexes 522-003 & 330-001)*
 - *Index 000-516 - Turnouts - Resurfacing Projects*
 - ✓ e) *Index 350-001 - Concrete Pavement Joints*
 - ➔ ✓ f) *Index 522-001 - Concrete Sidewalk*
 - g) *Index 522-002 - Detectable Warnings and Sidewalk Curb Ramps*
 - h) *Misc. Traffic Control Signals and Devices (Including: Indexes 630-001, 634-002, 635-001, 659-010, 660-001, and 676-010)*

SHEET 1 of 8:

Updated Note 'C'

New Language

GENERAL NOTES:

1. Cross Slopes and Grades:

A. Sidewalk, ramp, and landing slopes (i.e. 0.02, 0.05, and 1:12) shown in this Index are maximums. With approval of the Engineer, provide the minimum feasible slope where the requirements cannot be met.

B. Landings must have cross-slopes less than or equal to 0.02 in any direction.

C. Maintain a single longitudinal slope along each side of the curb ramp. Ramp slopes are not required to exceed 15 feet in length.

D. Joints permitted at the location of Slope Breaks. Otherwise locate joints in accordance with Index 522-001. No joints are permitted within the ramp portion of the Curb Ramp.

GENERAL NOTES

FY 2018-19 Standard Plans, Index 522-001

1. Cross Slopes and Grades:

A. Sidewalk, ramp, and landing slopes (i.e. 0.02, 0.05, and 1:12) shown in this Index are maximums. With approval of the Engineer, provide the minimum feasible slope where the requirements cannot be met.

B. Landings must have cross-slopes less than or equal to 0.02 in any direction.

C. Install ramp slopes along a single linear plane (i.e. no warps or varying slope). Ramp slopes are not required to exceed 15 feet in length.

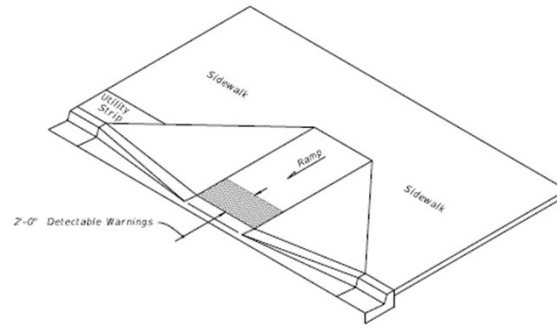
D. Joints permitted at the location of Slope Breaks. Otherwise locate joints in accordance with Index 522-001. No joints are permitted within the ramp portion of the Curb Ramp.

Old Language

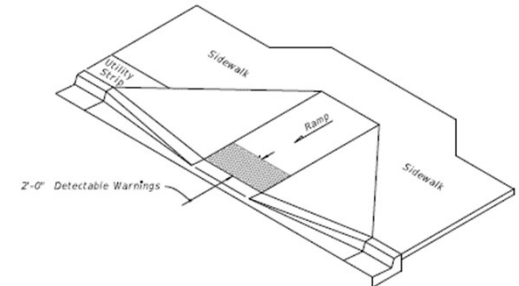
LAST REVISION 11/01/18	DESCRIPTION:		FY 2019-20 STANDARD PLANS	DETECTABLE WARNINGS AND SIDEWALK CURB RAMPS	INDEX 522-002	SHEET 1 of 8
---------------------------	--------------	--	------------------------------	---	------------------	-----------------

SHEET 2 of 8:

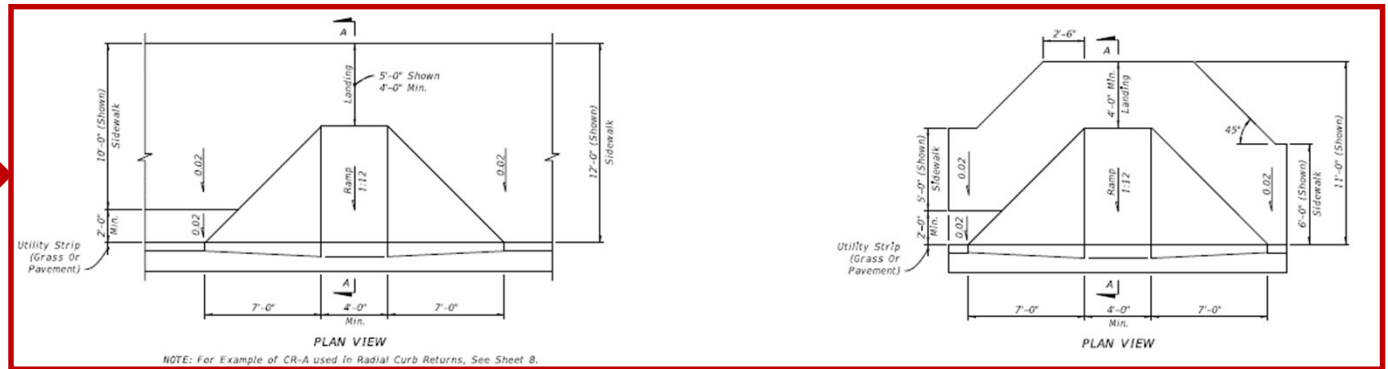
Updated CR-A and CR-B Plan View to Work With Current Sidewalk Width Requirements See FDM 222



ISOMETRIC VIEW



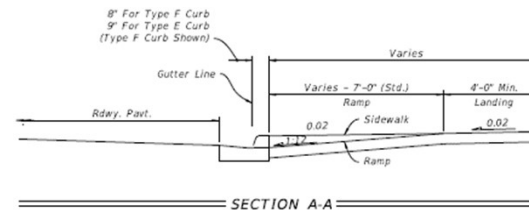
ISOMETRIC VIEW



NOTE: For Example of CR-A used in Radial Curb Returns, See Sheet 8.

CR-A

CR-B



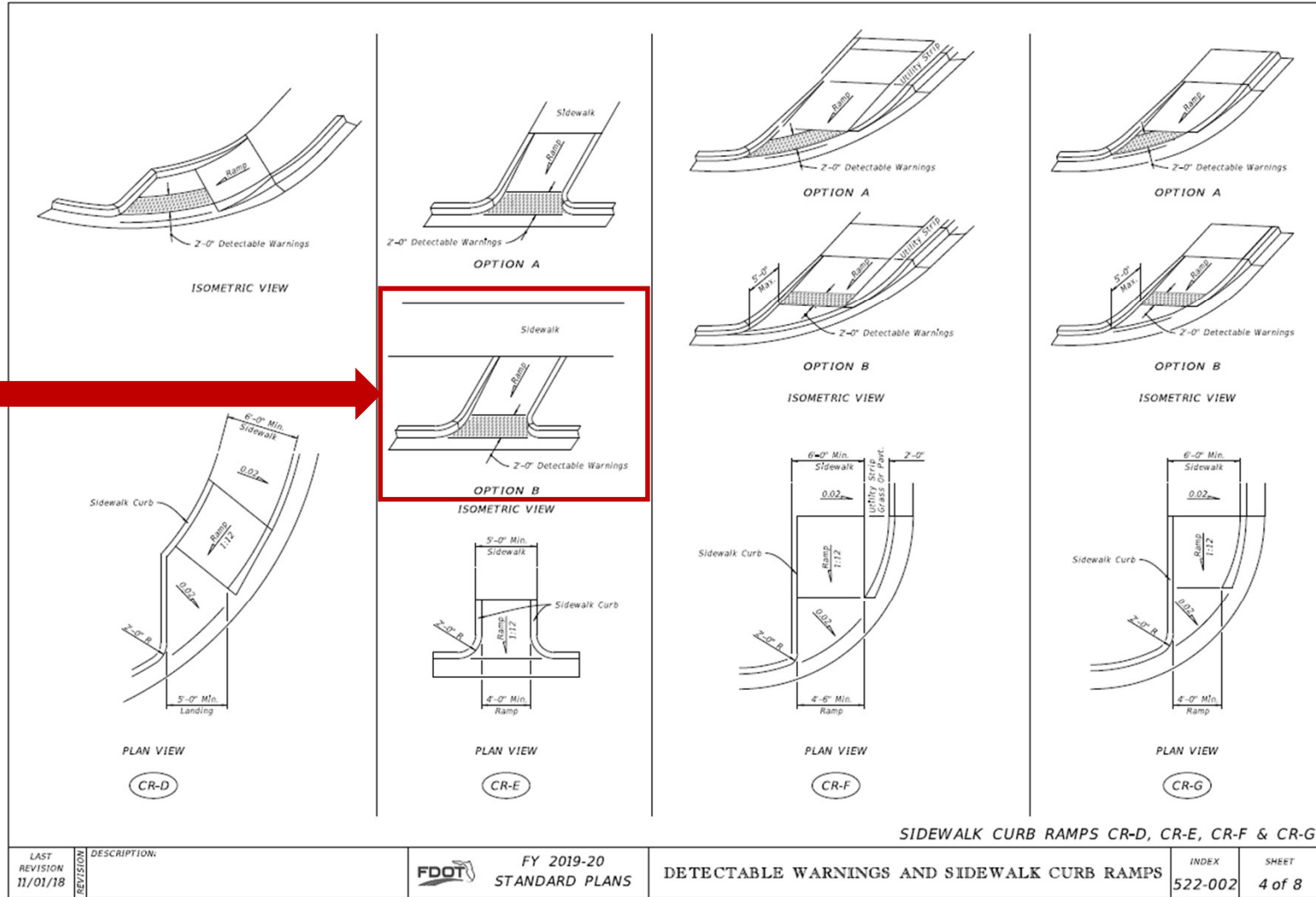
8' For Type F Curb
9' For Type E Curb
(Type F Curb Shown)

SIDEWALK CURB RAMPS CR-A AND CR-B

LAST REVISION	DESCRIPTION	FY 2019-20	INDEX	SHEET
11/01/18		STANDARD PLANS	DETECTABLE WARNINGS AND SIDEWALK CURB RAMPS	522-002 2 of 8

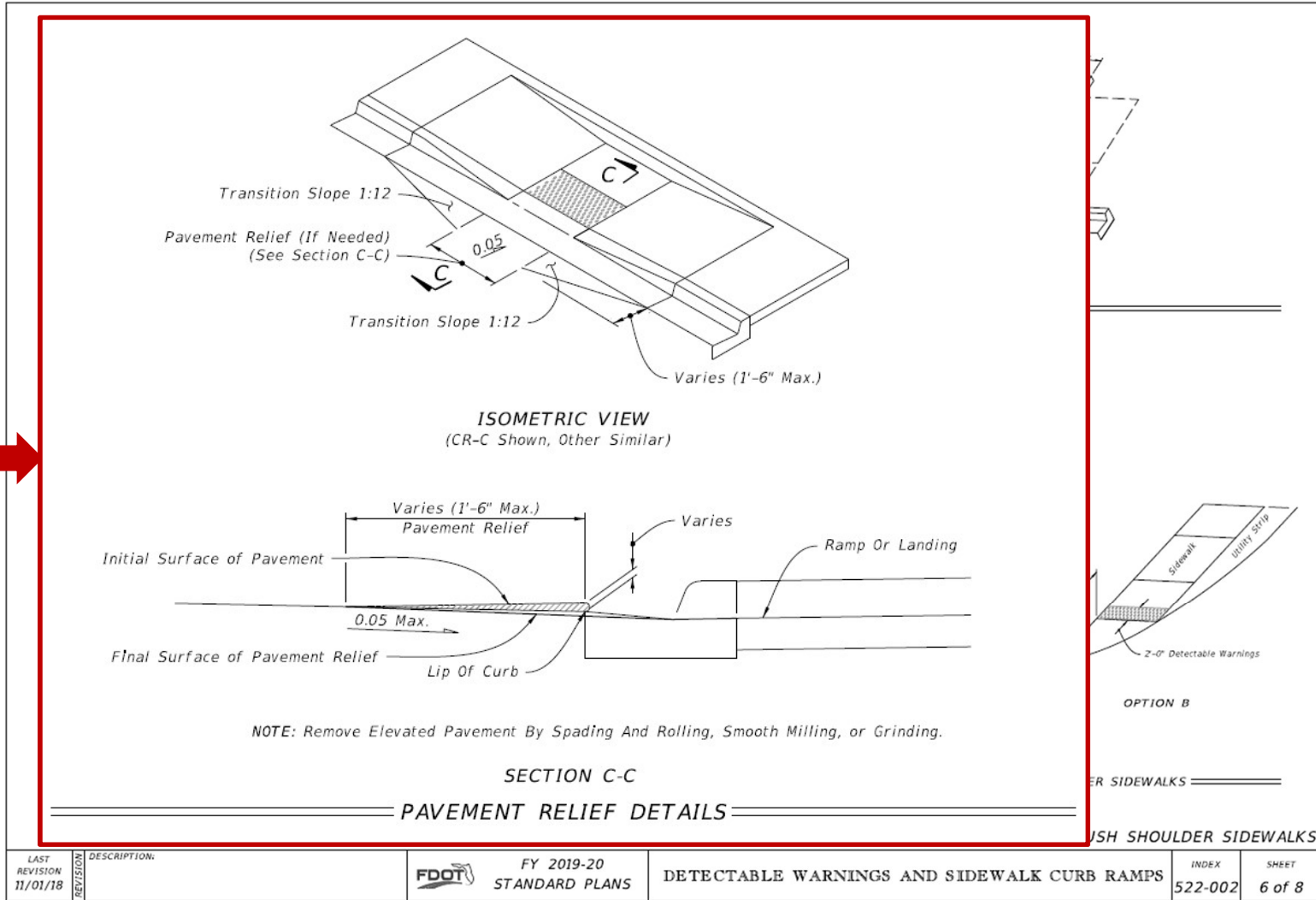
SHEET 4 of 8:

Added Option B for Parallel Sidewalk



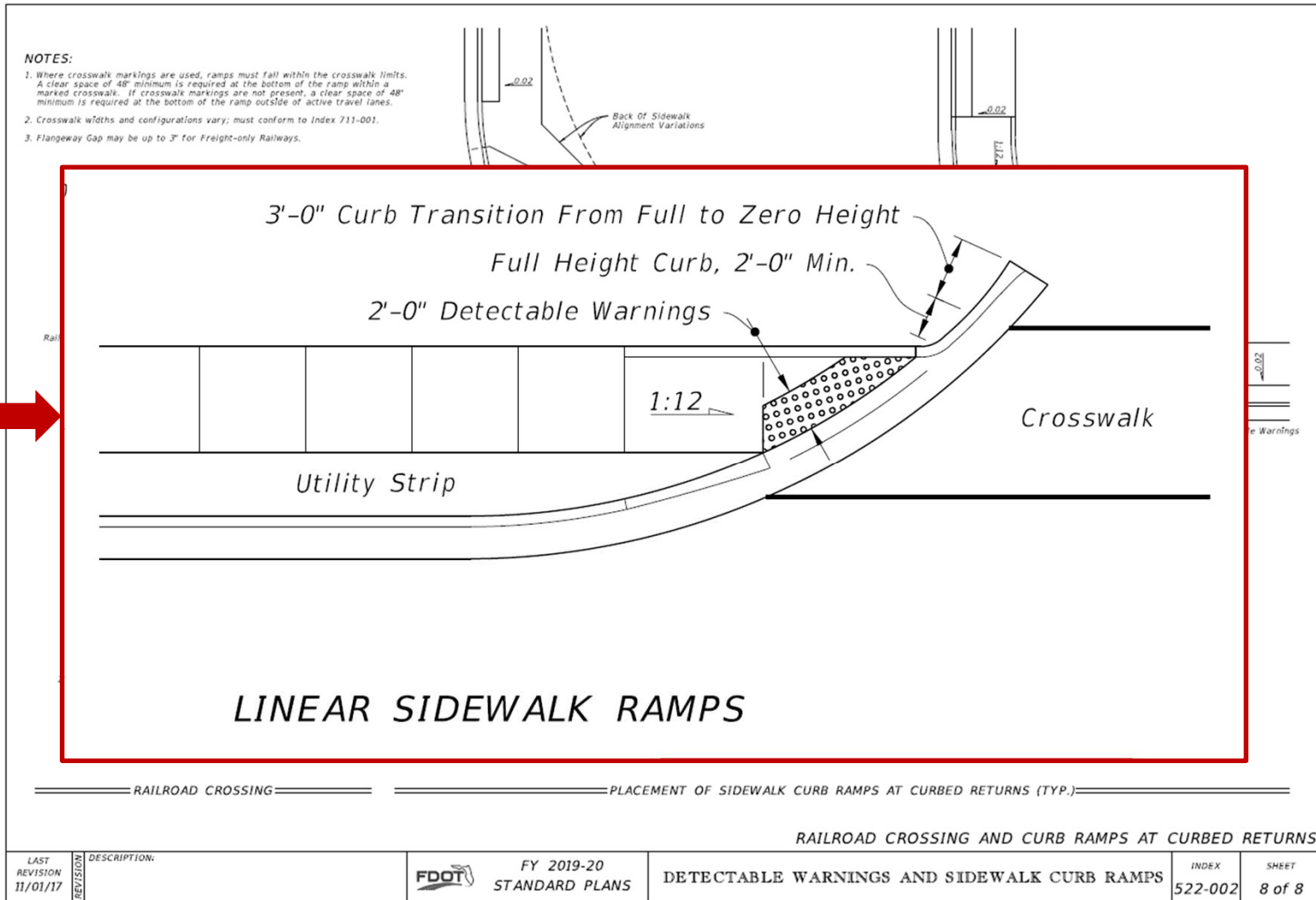
SHEET 6 of 8:

**Re-Indexed 160-001:
Stabilization Details**



SHEET 8 of 8:

Added Curb
Transition Details
from Old Index
000-515

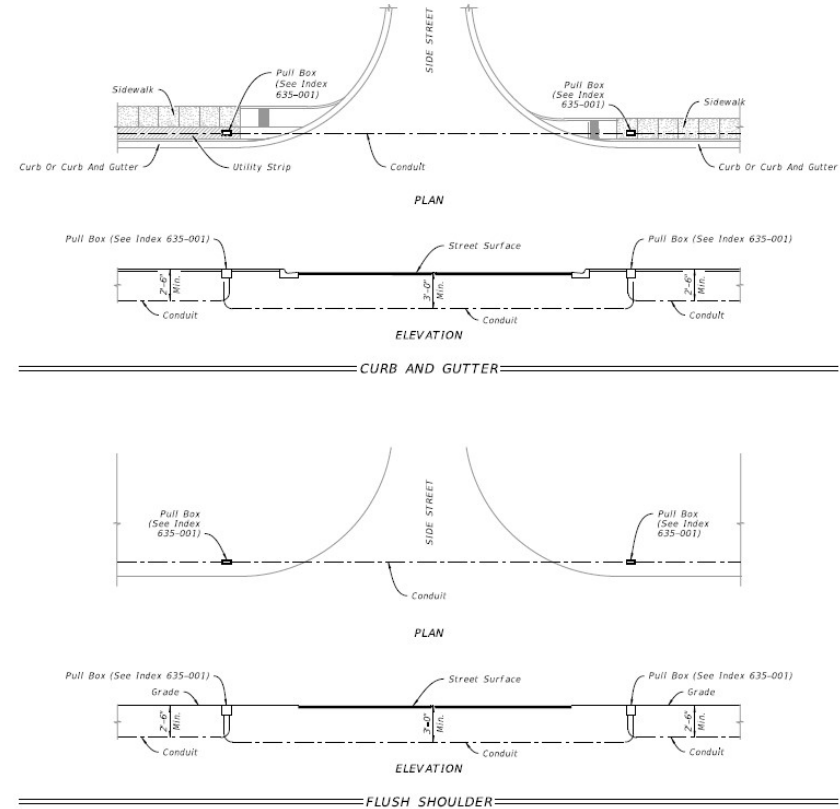


Standard Plans – Primary Updates:

- ✓ 1) *General Overview and Website*
- 2) *Misc. Indexes*
 - ✓ a) *Index 000-506 - Miscellaneous Earthwork Details (Including: Indexes 160-001 & 120-001)*
 - ✓ b) *Index 000-510 - Superelevation - High Speed Roadways*
 - ✓ c) *Index 000-511 - Superelevation - Low Speed Roadways*
 - ✓ d) *Index 000-515 - Turnouts and Driveways (Including: New Indexes 522-003 & 330-001)*
 - *Index 000-516 - Turnouts - Resurfacing Projects*
 - ✓ e) *Index 350-001 - Concrete Pavement Joints*
 - ✓ f) *Index 522-001 - Concrete Sidewalk*
 - ➔ g) *Index 522-002 - Detectable Warnings and Sidewalk Curb Ramps*
 - h) *Misc. Traffic Control Signals and Devices (Including: Indexes 630-001, 634-002, 635-001, 659-010, 660-001, and 676-010)*

Miscellaneous 600 Series Indexes:

- Updated Layout
- Consolidated Notes
- Detailed to Current CADD Standards
- Included:
 - **Index 630-001 (Conduit Installation Details)**
 - **Index 634-002 (Aerial Interconnect)**
 - **Index 635-001 (Pull and Splice Boxes)**
 - **Index 659-010 (Span Wire Mounted Sign Details)**
 - **Index 660-001 (Vehicle Loop Installation Details)**
 - **Index 676-010 (Cabinet Installation Details)**



CONDUIT INSTALLATION DETAILS

Questions?



Derwood Sheppard, P.E., M.Eng.
Standard Plans Publication Engineer
Central Office, Roadway Design
(850) 414-4334
derwood.sheppard@dot.state.fl.us

FY 2019-20 Standard Plans Update Training

Richard Stepp, P.E.
Standard Plans Engineer
Central Office, Roadway Design
(850) 414-4313
richard.stepp@dot.state.fl.us

Standard Plans – Primary Index Updates:

- 1) **Index 536-001 – Guardrail**
 - **New** “Trailing Anchorage”
 - Updated Downstream Placement Policy
- 2) **Index 521-001 – Concrete Barrier**
 - **New** Barrier-Mounted Sign Support Option – Dual Supports
 - **New** Callouts for “Variable Section Width” Start/Stop Points
 - **New** “Wall Shielding Barrier” & General “Max. Taper Rates”
- 3) **Index 521-010 – Opaque Visual Barrier (OVB)**
 - **Redeveloped** Index Sheets for Clarity
 - Durability Improvements
 - Varying Barrier Heights
 - **New** SPI and FDM Section
- 4) **Index 544-001 – Crash Cushion Details**
 - **Redeveloped** Index Sheets and SPI for Clarity
 - **Redeveloped** Summary of Permanent Crash Cushion Table
 - **New** Pay Items

Standard Plans – Primary Index Updates:

- ➔ 1) *Index 536-001 – Guardrail*
 - *New “Trailing Anchorage”*
 - *Updated Downstream Placement Policy*

Sheet 9: No More "Type II"!

INSTALLED ELEVATION

SINGLE TRAILING ANCHORAGE INSTALLED PLAN

DOUBLE FACE TRAILING ANCHORAGE INSTALLED PLAN

END TREATMENT - TRAILING ANCHORAGE, TYPE II

NOTES:

- COMPONENT DETAILS:** For additional Type II component details, See Sheet 10. For Rectangular Washer details, See Sheet 22.
- END UNITS:** Use materials for end units as defined in Specifications Section 967. End Units are referred to as "End or Buffer Sections" in AASHTO M190.
 - a. Excavate, backfill, and compact material to provide full passive soil resistance to all surfaces of the Tube and Soil Plate.
 - b. Drive the Tube and Soil Plate as a single unit using a dummy timber post to prevent damage to the Breakaway Post.
- FOUNDATIONS:** Install Steel Tubes with attached Soil Plates by either of the following methods:
- GENERAL GUARDRAIL:** General Guardrail typically includes Panels and Post Spacing as shown on Sheet 2, including parallel and tapered segments. Transitions, Low-Speed Guardrail, or Reduced Post Spacing Guardrail segments may be substituted for the General Guardrail shown herein if indicated in the plans.
- SIDEWALK REQUIREMENTS:** When sidewalks are located adjacent to the End Treatment, install a Rounded End Unit (Flared End Unit not permitted for this case).

When sidewalks or shared use paths are within 4'-0" from the backs of posts, use the Timber Post option shown (including the First post in the General Guardrail segment). Install the Pipe Rail for adjacent Steel Posts, if used, as shown on Sheet 20.
- END DELINEATOR:** Mount retroreflective sheeting to the approach face of the End Unit in accordance with Specification Sections 536 and 967.

FLARED END UNIT

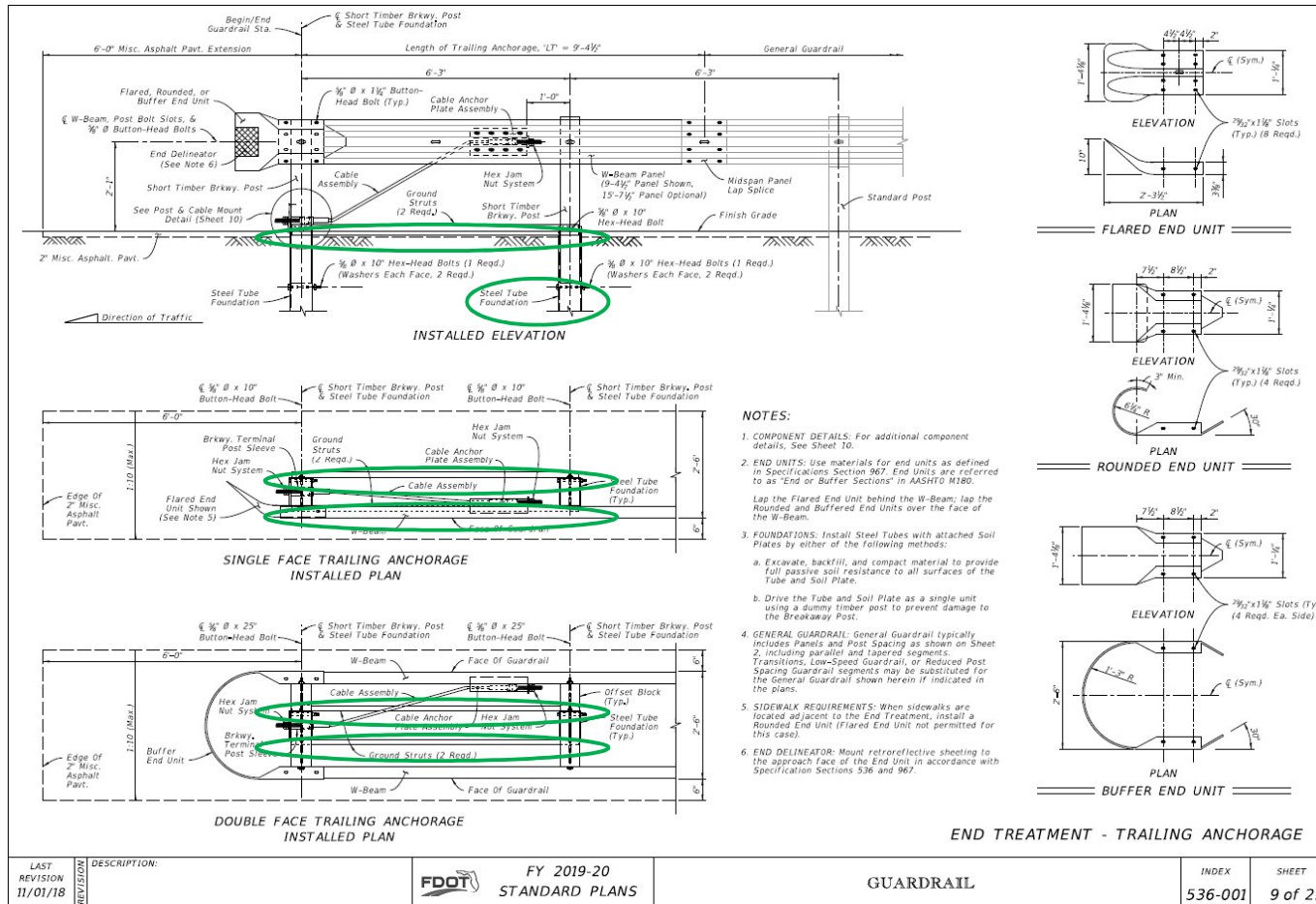
ROUNDED END UNIT

BUFFER END UNIT

LAST REVISION	DESCRIPTION:	FDOT	FY 2018-19	GUARDRAIL	INDEX	SHEET
11/01/17			STANDARD PLANS		536-001	9 of 22

- Soil Plate System Removed
- Rectangular Washers Removed

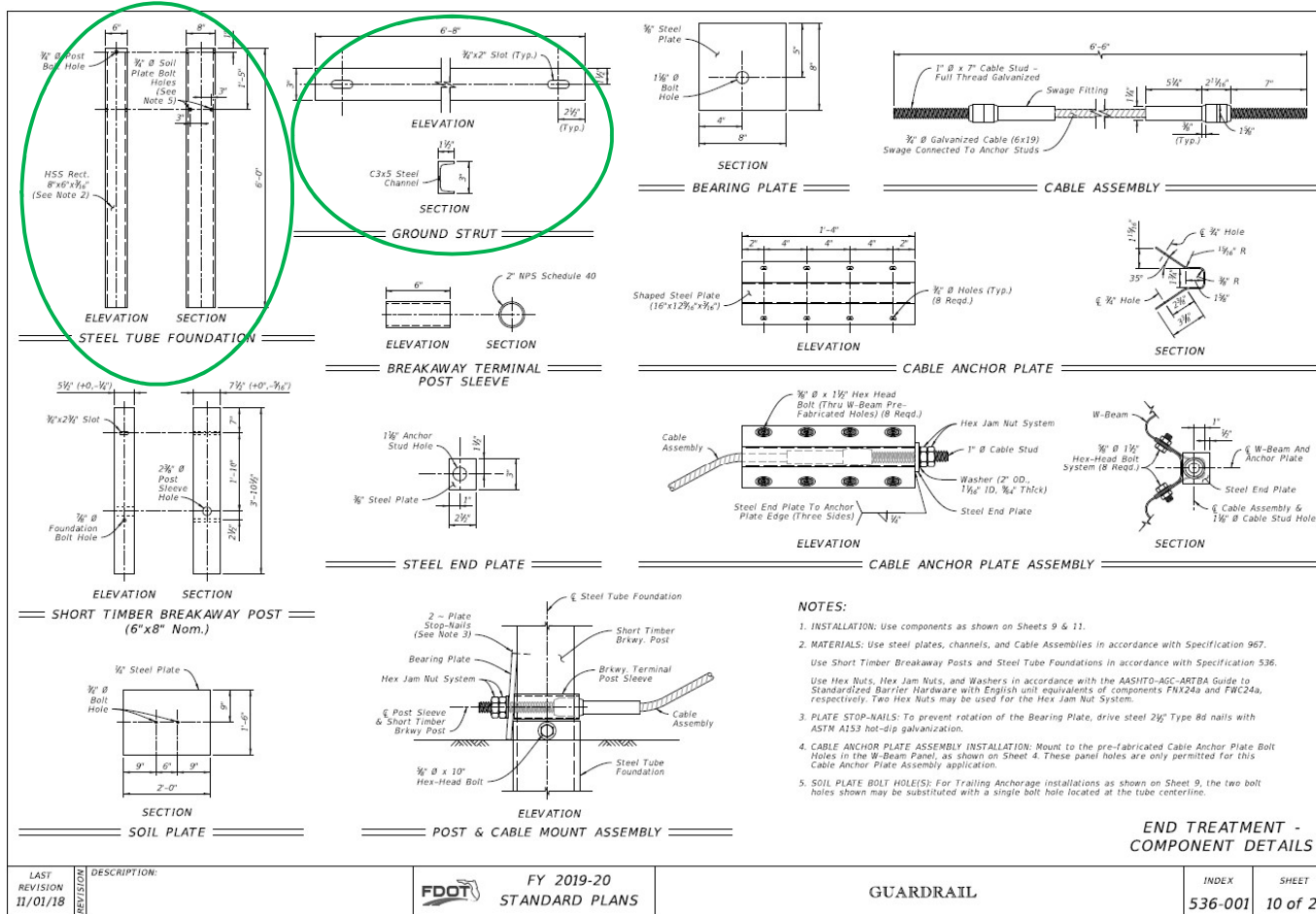
Sheet 9: **New Trailing Anchorage!**



- New Strut System Added
 - 2 Struts Total (1 Each Side)
- New Short Timber Breakaway Post & Steel Tube Foundation at Post 2
- Changes follow latest designs for MASH, following discussions with MwRSF

LAST REVISION 11/01/18	DESCRIPTION:	FDOT FY 2019-20 STANDARD PLANS	GUARDRAIL	INDEX 536-001	SHEET 9 of 22
---------------------------	--------------	--------------------------------------	-----------	------------------	------------------

Sheet 10: **New Trailing Anchorage!**



- New Strut System Added
- Steel Tube Foundations lengthened by 1 foot

LAST REVISION 11/01/18	DESCRIPTION:	FDOT FY 2019-20 STANDARD PLANS	GUARDRAIL	INDEX 536-001	SHEET 10 of 22
---------------------------	--------------	--------------------------------------	-----------	------------------	-------------------

BOE - DQE: *New Trailing Anchorage!*

536- 85- AA Guardrail End Treatment, EA

AA = Type

Single Face

20 (Trailing Anchorage) effective July 2019 lettings

22 (Flared Approach Terminal) valid through June 2019 lettings

24 (Parallel Approach Terminal)

~~25 (Type II Trailing Anchorage) valid through June 2019 lettings; see AA=20 for replacement~~

26 (CRT End Treatment)

PENDING: ?? (Flared Approach Terminal- NCHRP 350 TL-3) For Maintenance Use ONLY

Double Face

27 (Double Face Approach Terminal)

~~28 (Double Face Type II Trailing Anchorage) valid through June 2019 lettings; see AA=20 for replacement~~

29 (Double Face Trailing Anchorage) effective July 2019 lettings

- New Pay Items in Basis of Estimates (BOE – DQE):
 - 536-85-20
 - 536-85-29

SPI, Part C: **New Trailing Anchorage!**

Standard Plans Instructions
Index 536-001 Guardrail

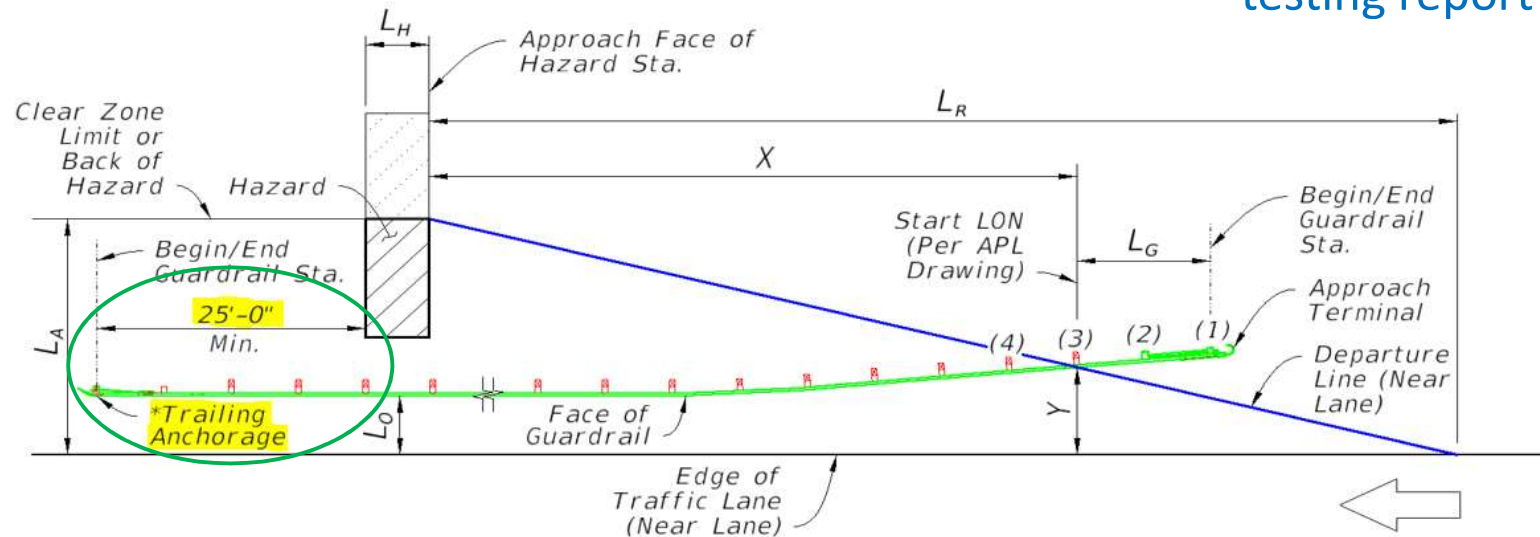
Topic No. 625-010-003
FY 2019-20

C. End Treatments:

An End Treatment segment is required for all guardrail ends where the guardrail does not transition into another barrier type (e.g. Approach or Trailing End Transition Connections to Rigid Barrier). End Treatments are divided into three types.

1. **Trailing Anchorages:** Place a Trailing Anchorage on the downstream ends of all guardrail runs with respect to the nearest traffic lane, except where the location is within the Clear Zone of an opposing traffic lane. **Locate the end post of the Trailing Anchorage at least 25 feet downstream of any hazards being shielded.**

- Extend Trailing Anchorage to **25 feet** downstream of hazard being shielded
- Based on latest MASH crash testing report

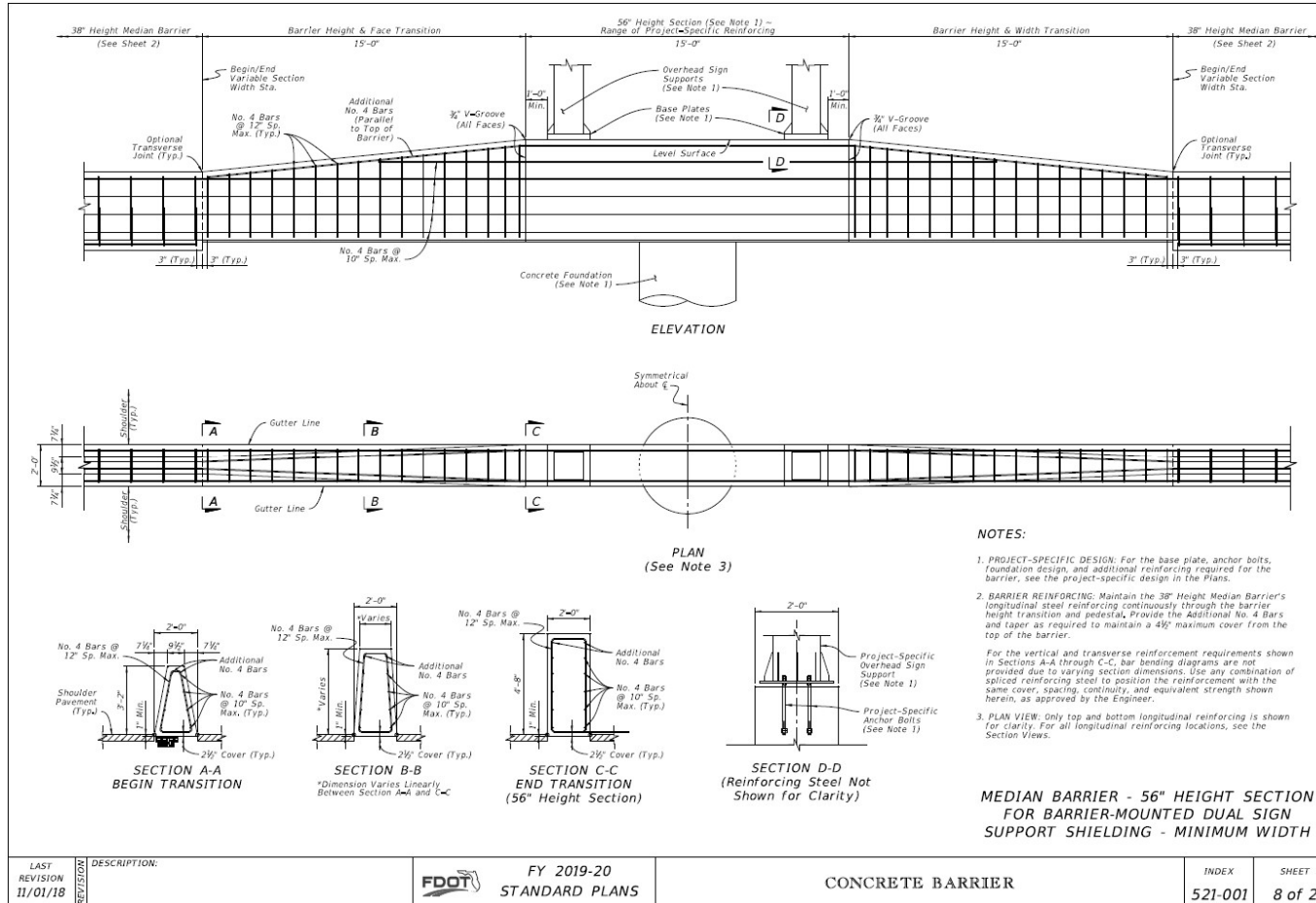


Standard Plans – Primary Index Updates:

- ✓ 1) **Index 536-001 – Guardrail**
 - **New** “Trailing Anchorage”
 - Updated Downstream Placement Policy

- ➔ 2) **Index 521-001 – Concrete Barrier**
 - **New** Barrier-Mounted Sign Support Option – Dual Supports
 - **New** Callouts for “Variable Section Width” Start/Stop Points
 - **New** “Wall Shielding Barrier” & General “Max. Taper Rates”

Sheet 8: New Barrier-Mounted Dual Sign Supports



- This is an alternative to larger sign supports with barrier widening
- Design is for least use of space
- No shoulder reduction: Barrier Gutter Lines remain at 2 foot barrier width

BOE - DQE: Variable Section Width Callouts

521- 1- A Median Concrete Barrier, LF

A= Type, Single Slope, effective July 2018

11 (38" Height) Symmetrical

12 (Short Grade-Separated)

13 (Tall Grade-Separated)

14 (Variable Section Width for Sign or Pier Shielding)

Segments included under -14 pay item:

Median Barrier – 56" Height Section" (with transitions)

Median Barrier – 38" Height Split Section" (with transitions)

Median Barrier – 44" Height Split Section" (with transitions)

- Existing Pay Item – Descriptions now added
- Median Concrete Barrier 521-1-14 is for *double-faced* application

BOE - DQE: Variable Section Width Callouts

521- 72- AA Shoulder Concrete Barrier, LF

40 (38" or 44" Height) Index 521-001

41 (38" Retaining Section) Index 521-001, sheet 14 of 22

42 (38" Trench Footing Section) Index 521-001

43 (38" Curb & Gutter Barrier) Index 521-001

44 (44" Pier Protection Barrier/Crash Wall) Index 521-002

56 (56" Pier Protection Barrier/Crash Wall) Index 521-002

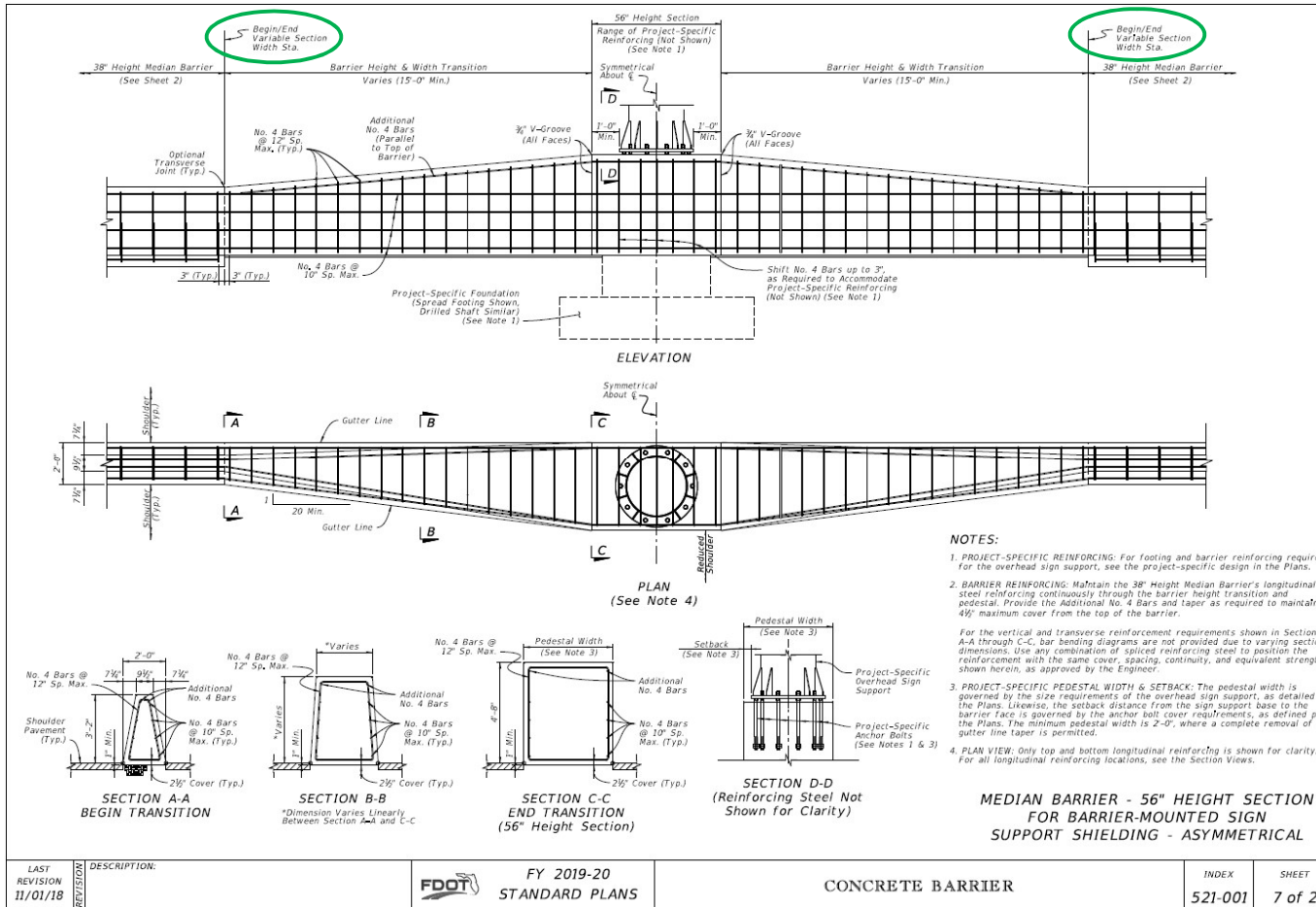
60 (38" Wall Shielding Barrier) Index 521-001, effective July 2019

61 (Variable section width for wall or sign shielding) Index 521-001, effective July 2019

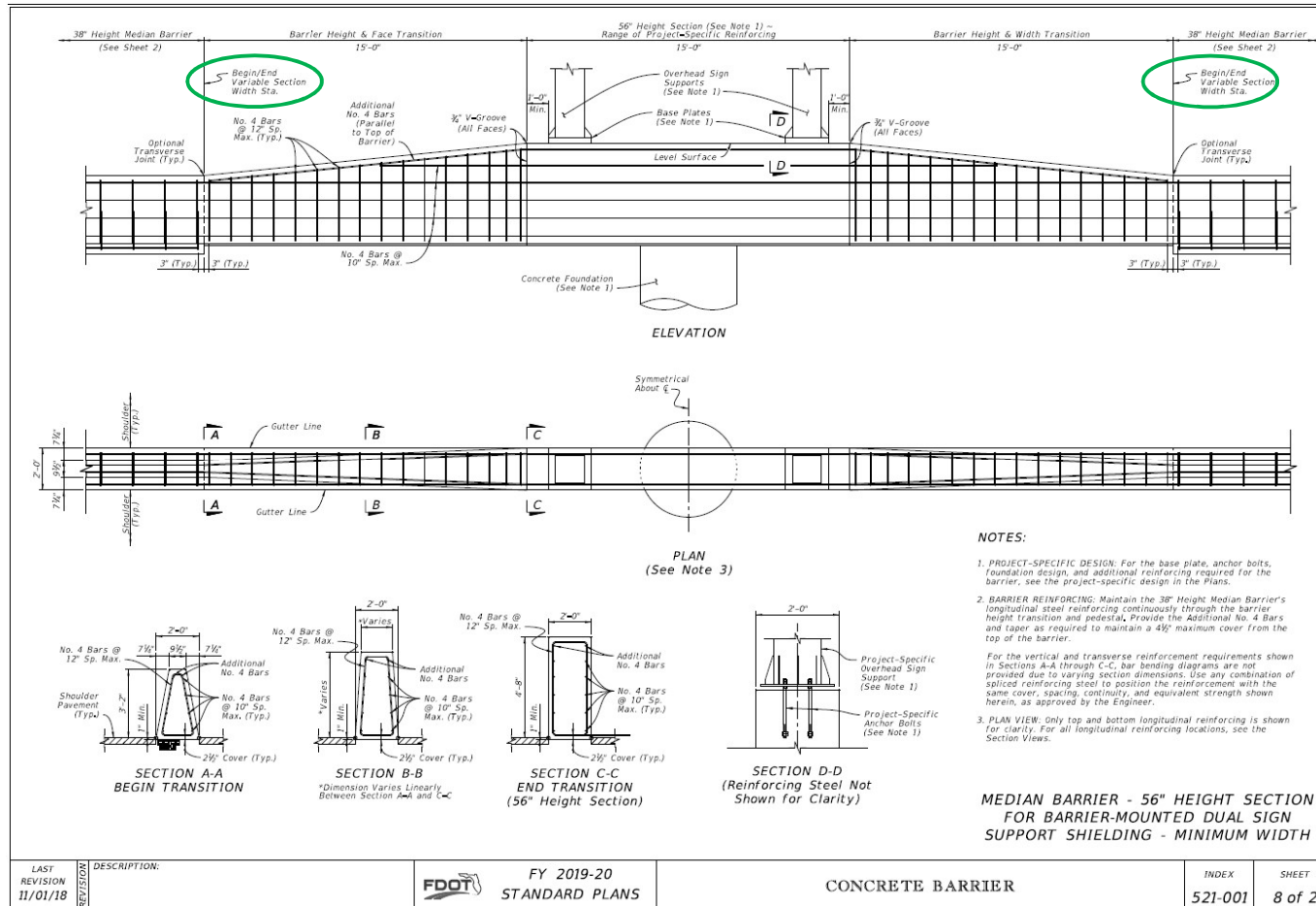
- **New Pay Item** for single-faced Wall Shielding Barrier
- Shoulder Concrete Barrier 521-72-61 is for *single-faced* application

Sheet 7: Variable Section Width Callouts

- Example of... Variable Section Width Pay Item (Double-Faced)



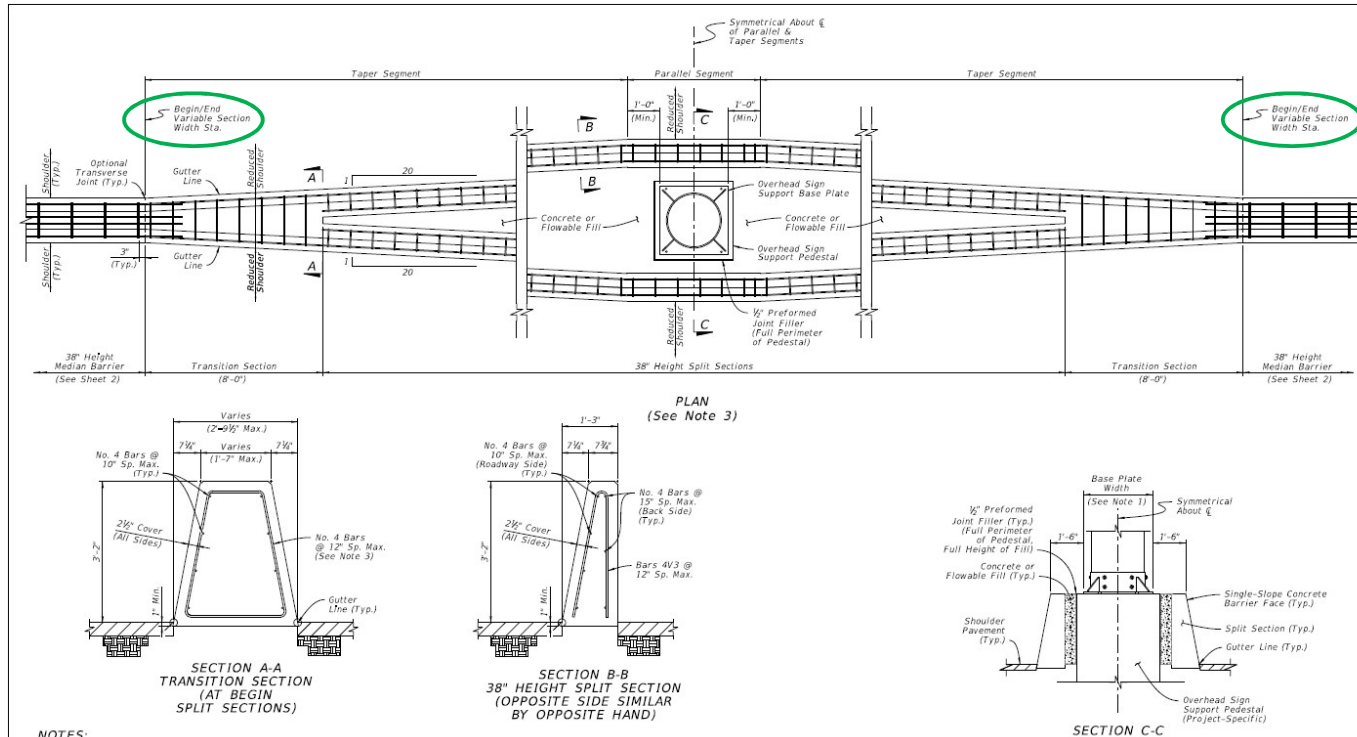
Sheet 8: Variable Section Width Callouts



- Example of... Variable Section Width Pay Item (Double-Faced)

NOTE:
Even though gutter line width doesn't change, the barrier face width changes, so the concept still applies.

Sheet 9: Variable Section Width Callouts



- Example of... Variable Section Width Pay Item (Double-Faced)

NOTE: Measurement is along centerline of entire Variable Section Width system per the SPI and Specifications.

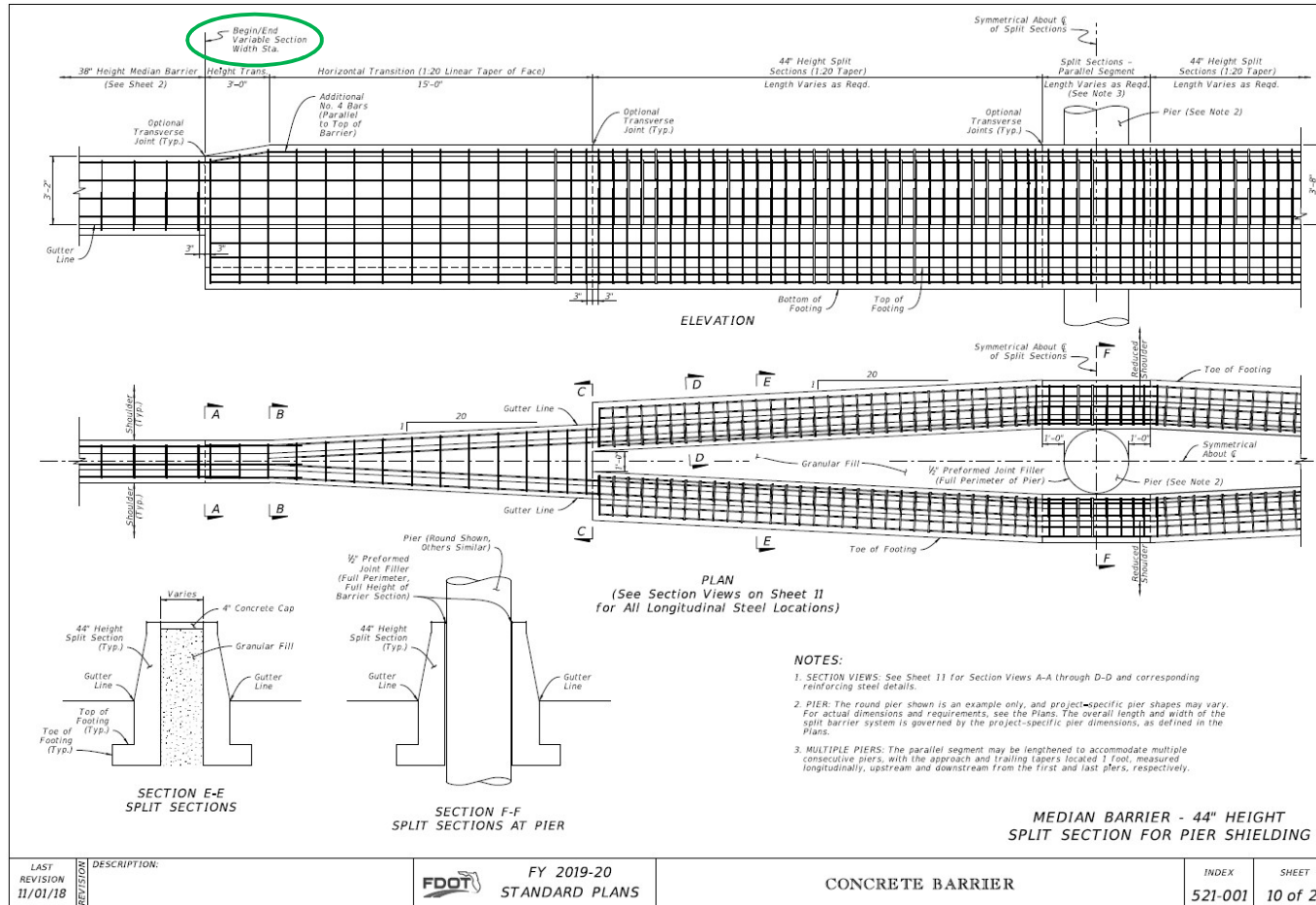
NOTES:

1. OVERHEAD SIGN SUPPORT: The overhead sign support shown is an example only; see the Plans for the project-specific dimensions and requirements. The overall length and width of the barrier's taper and parallel segments is governed by the overhead sign support dimensions as defined in the Plans.
2. MULTIPLE SIGN SUPPORTS: The parallel segment may be lengthened to accommodate multiple sign supports, with the approach and trailing tapers located 1 foot, measured longitudinally, upstream and downstream from the first and last sign support bases, respectively.
3. PLAN VIEW: Only outermost longitudinal reinforcing is shown for clarity. For all longitudinal reinforcing locations, see the Section Views.
4. STIRRUP BARS: For the vertical and transverse reinforcement requirements shown in Sections A-A, bar bending diagrams are not provided due to varying section dimensions. Use any combination of spliced reinforcing steel to position the reinforcement with the same cover, spacing, continuity, and equivalent strength shown herein, as approved by the Engineer.
5. CONCRETE OR FLOWABLE FILL: Use Class NS Concrete in accordance with Specification 347 or Non-Excavatable Flowable Fill in accordance with Specification 121.

MEDIAN BARRIER - 38" HEIGHT SPLIT SECTION FOR STAND-ALONE SIGN SUPPORT SHIELDING

LAST REVISION 11/01/18	DESCRIPTION:	FDOT FY 2019-20 STANDARD PLANS	CONCRETE BARRIER	INDEX 521-001	SHEET 9 of 26
---------------------------	--------------	--------------------------------------	------------------	------------------	------------------

Sheet 10: Variable Section Width Callouts

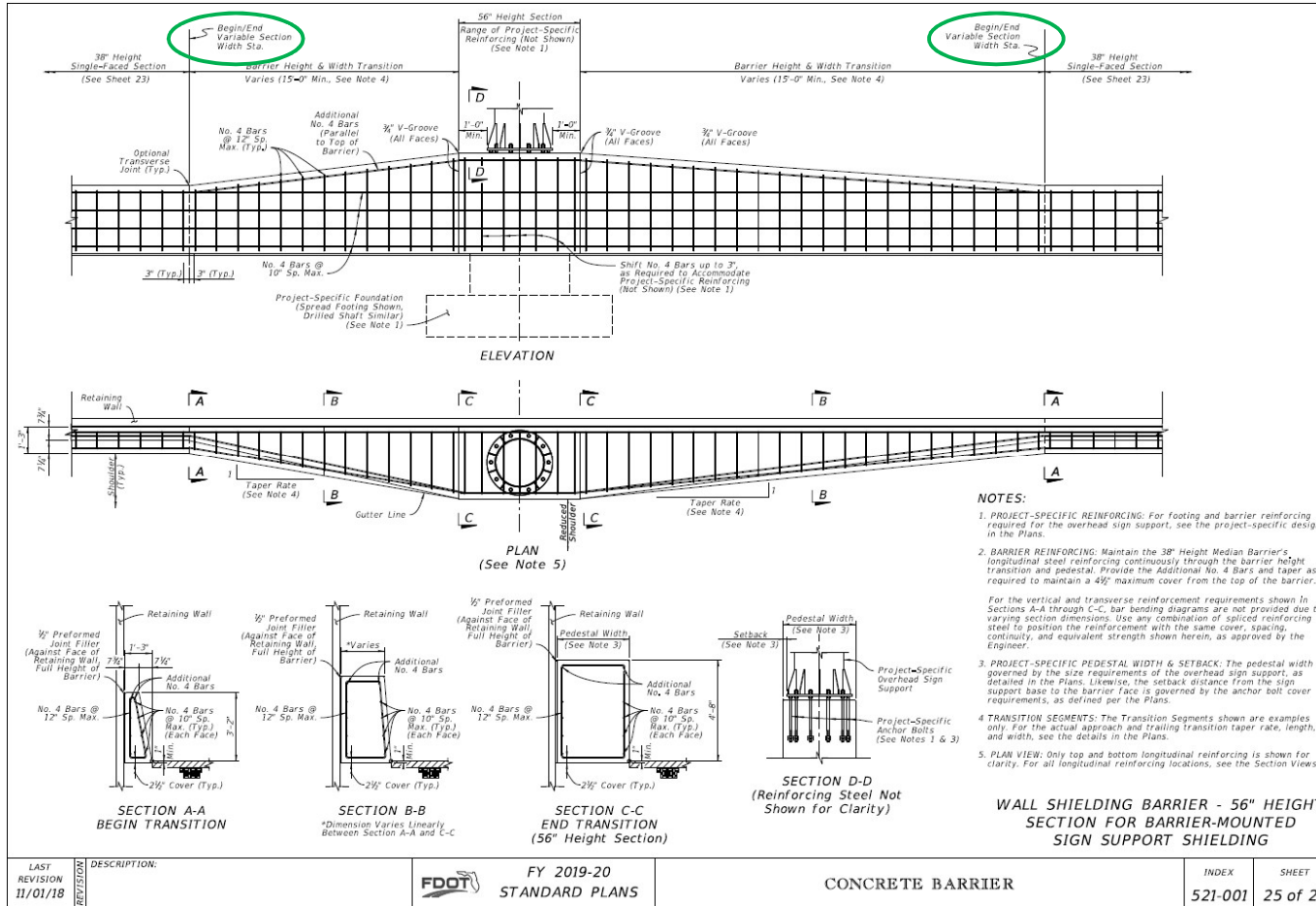


- Example of... Variable Section Width Pay Item (Double-Faced)

NOTE: Measurement is along centerline of entire Variable Section Width system per the SPI and Specifications.

LAST REVISION 11/01/18	DESCRIPTION:	FDOT FY 2019-20 STANDARD PLANS	CONCRETE BARRIER	INDEX 521-001	SHEET 10 of 26
---------------------------	--------------	--------------------------------------	------------------	------------------	-------------------

Sheet 25: Variable Section Width Callouts

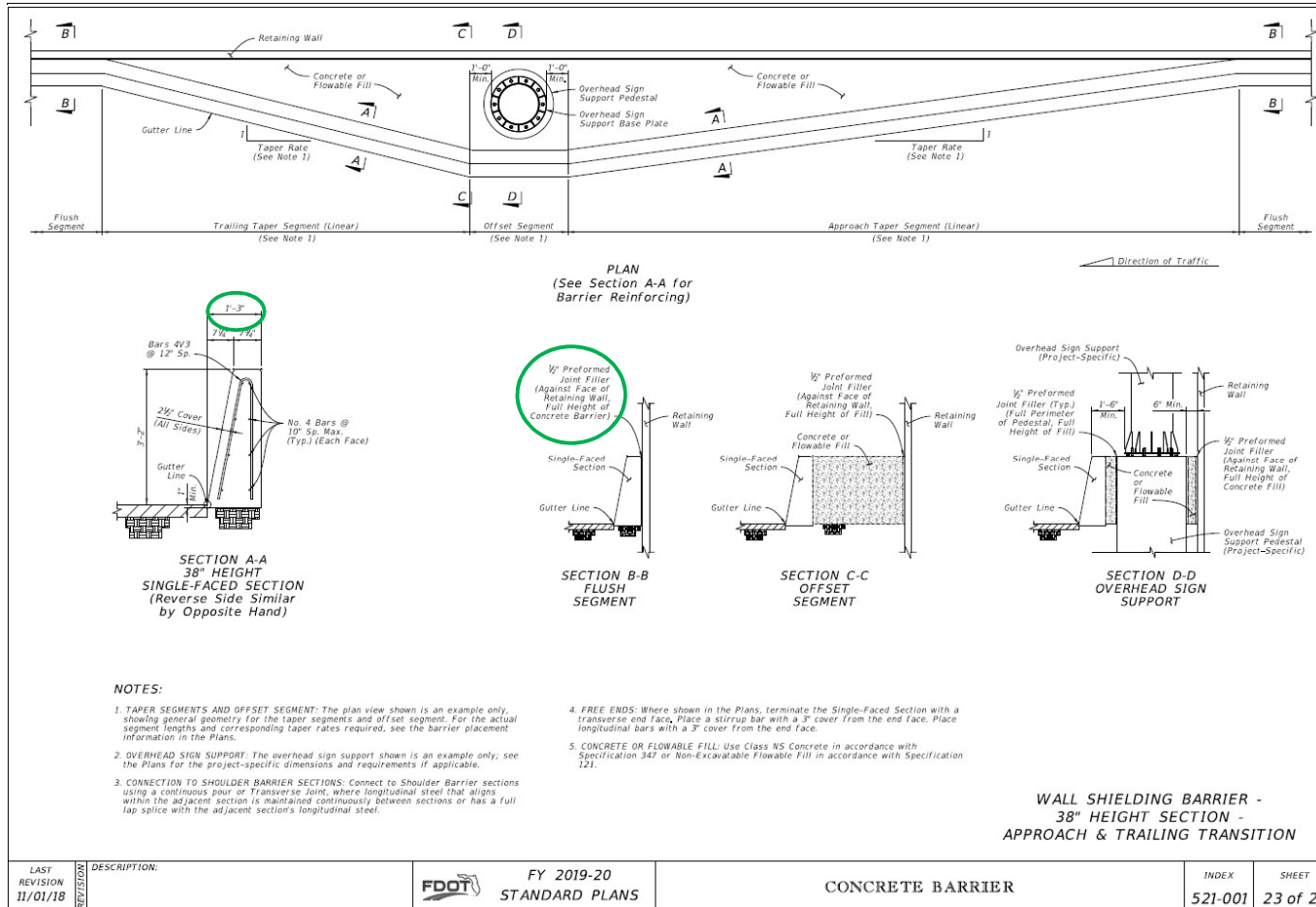


- Example of... Variable Section Width Pay Item (Single-Faced)
- Sneak Peak of *Wall Shielding Barrier*

Wall Shielding Barrier – Past Examples (Non-Standard)



Sheet 23: Wall Shielding Barrier – Approach & Trailing Taper



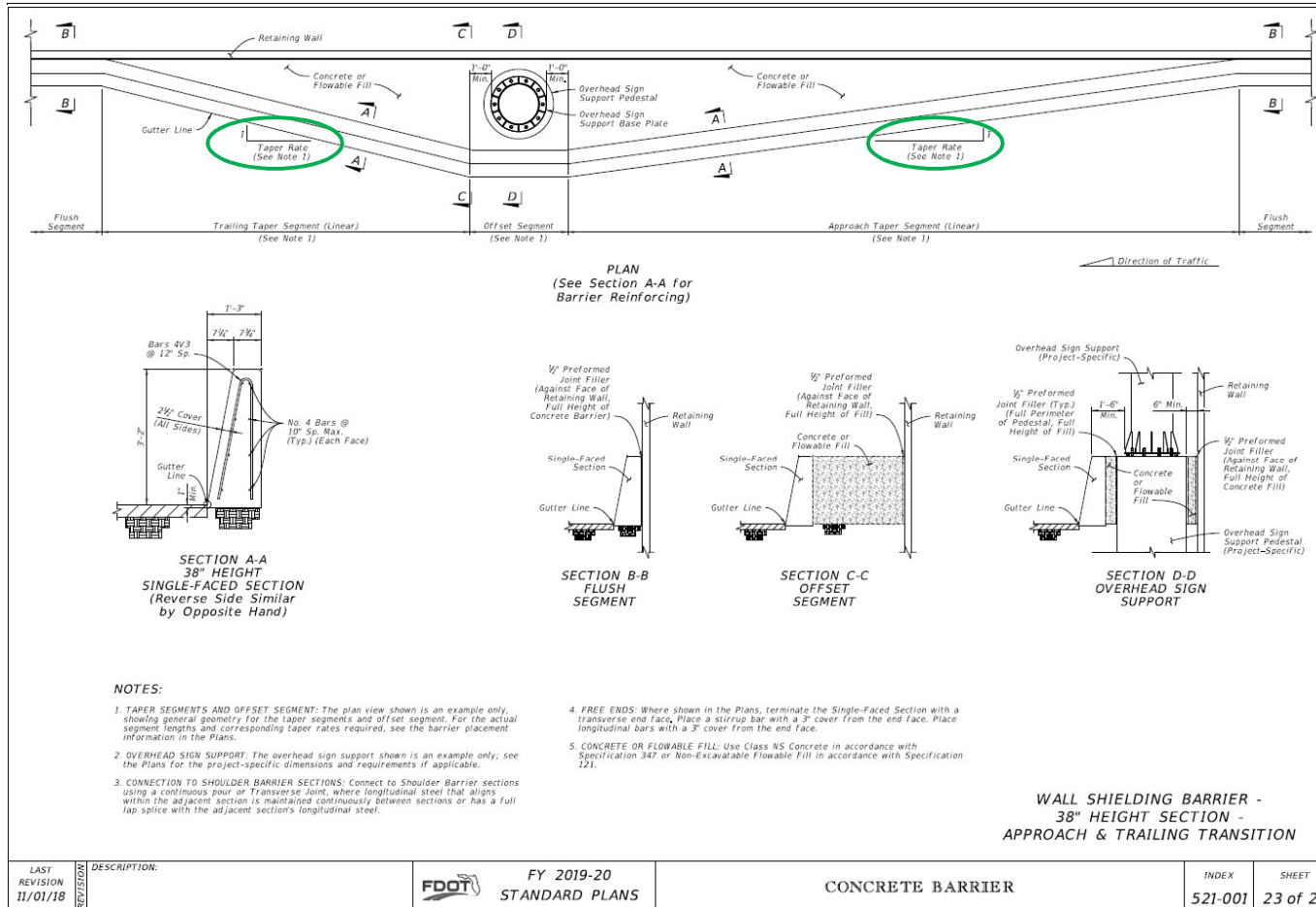
- Usage:** Decision is project-specific per the SPI, Part B (District-level decision)

- Space Needed:** Requires 1'-3½" from retaining wall to gutter line (Barrier Section plus half-inch joint filler)

Wall Shielding Barrier – Past Examples (Non-Standard) Approach and Trailing Taper (For Overhead Sign Support)



Sheet 23: Wall Shielding Barrier – Approach & Trailing Taper

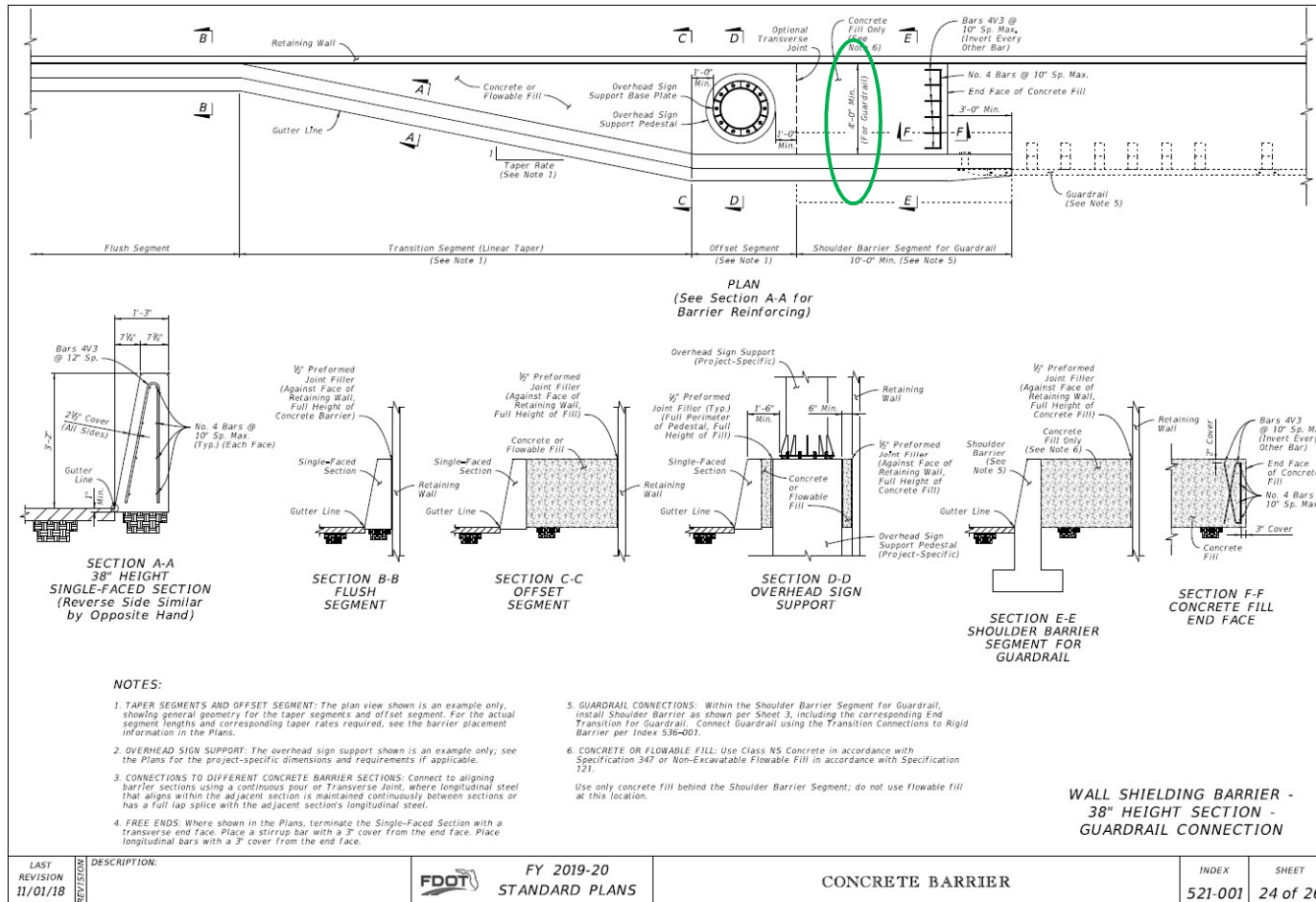


- **Tapers:** Requires project-specific approach and trailing taper rates based on Design Speed (upcoming slides)
- **Overhead Sign Support:** Project-specific Design, similar to Median Version, (Sheets 9-10)

Wall Shielding Barrier – Past Examples (Non-Standard) Guardrail Connection

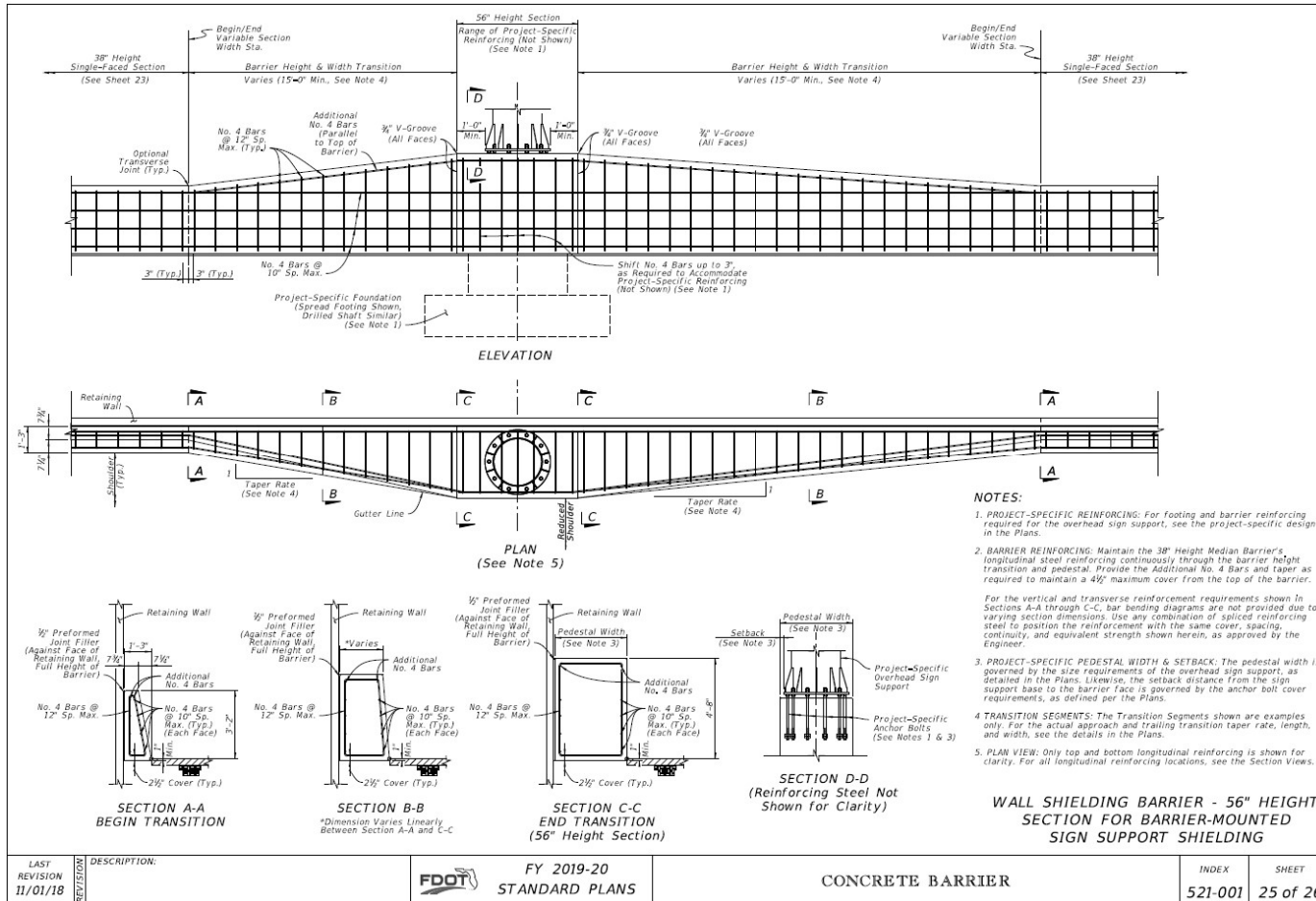


Sheet 24: Wall Shielding Barrier – Guardrail Connection



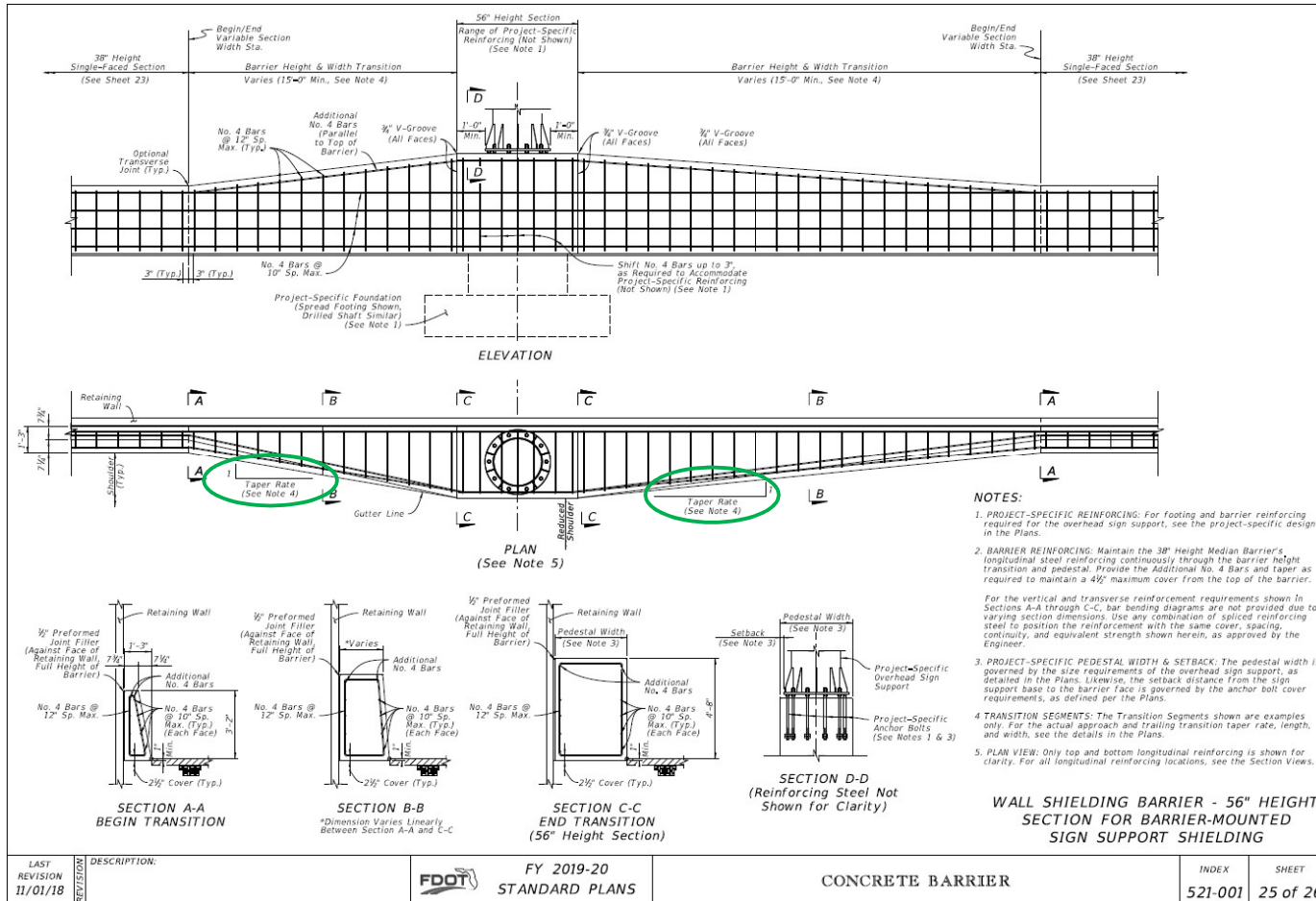
- **Space Needed:** Requires 5'-3½" from retaining wall to gutter line (for proper Guardrail setback)
- **Overhead Sign Support:** Project-specific design, similar to median version, (Sheets 9-10)

Sheet 25: Wall Shielding Barrier – Barrier-mounted Sign Support



- **Space Needed:** Requires minimal space for a sign support that is governed by project-specific width of Overhead Sign Support
- **Overhead Sign Support:** Project-specific design, similar to median version, (Sheets 6-8)

Sheet 25: Wall Shielding Barrier – Barrier-mounted Sign Support



- Tapers: Requires project-specific approach and trailing taper rates based on Design Speed (upcoming slides)

SPI: *New General Barrier Taper Rates*

G. Barrier Taper Rates:

Where conditions require the face of barrier to deviate from running parallel to the roadway, the shift in lateral offset must not exceed the taper rates provided below.

Table 2: Maximum Barrier Taper Rates

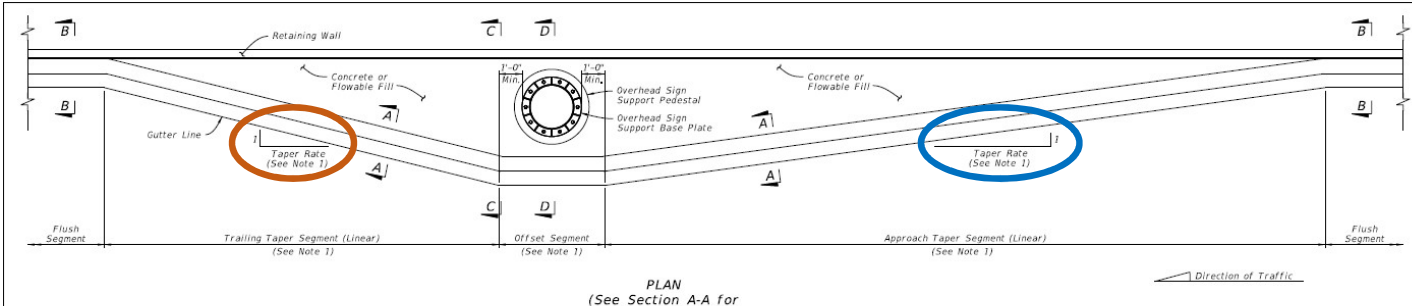
Barrier Type:	Design Speed (mph):	Approach End *Maximum Taper Rate:	Trailing End *Maximum Taper Rate
Median Barrier	All	1:20	1:20
	70	1:20	1:5
Shoulder Barrier, Curb & Gutter Barrier, and Wall Shielding Barrier	60	1:18	1:5
	55	1:16	1:5
	50	1:14	1:5
	45	1:12	1:5
	40	1:10	1:5
	30	1:8	1:5

*Taper Rate is measured relative to the roadway centerline (lateral offset : length)

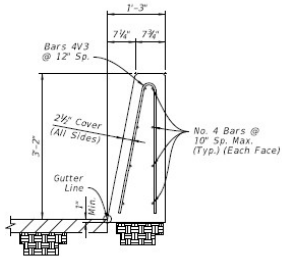
- **Median Barrier:** (double faced) is a consistent 1:20
- **Shoulder Barrier** (single-faced) varies by Design Speed and approach direction to assist with minimizing space requirements

SPI: **New General Barrier Taper Rates**

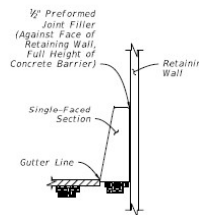
- Taper Example – Wall Shielding Barrier**



PLAN
(See Section A-A for
Barrier Reinforcing)



SECTION A-A
38" HEIGHT
SINGLE-FACED SECTION
(Reverse Side Similar
by Opposite Hand)



SECTION B-B
FLUSH
SEGMENT

NOTES:

- TAPER SEGMENTS AND OFFSET SEGMENT:** The plan view shown is an example only, showing general geometry for the taper segments and offset segment. For the actual segment lengths and corresponding taper rates required, see the barrier placement information in the Plans.
- OVERHEAD SIGN SUPPORT:** The overhead sign support shown is an example only; see the Plans for the project-specific dimensions and requirements if applicable.
- CONNECTION TO SHOULDER BARRIER SECTIONS:** Connect to Shoulder Barrier sections using a continuous pair of Transverse Joint, where longitudinal steel that aligns within the adjacent section is maintained continuously between sections or has a full lap splice with the adjacent section's longitudinal steel.

- FREE ENDS:** Where shown in transverse end face, Place 1 longitudinal bars with a 3" c.
- CONCRETE OR FLOWABLE FI:** Specification 347 or Non-Ex. 121.

Table 2: Maximum Barrier Taper Rates

Barrier Type:	Design Speed (mph):	Approach End *Maximum Taper Rate:	Trailing End *Maximum Taper Rate
Median Barrier	All	1:20	1:20
	70	1:20	1:5
Shoulder Barrier, Curb & Gutter Barrier, and Wall Shielding Barrier	60	1:18	1:5
	55	1:16	1:5
	50	1:14	1:5
	45	1:12	1:5
	40	1:10	1:5
	30	1:8	1:5

WALL SHIELDING BARRIER -
38" HEIGHT SECTION -
APPROACH & TRAILING TRANSITION

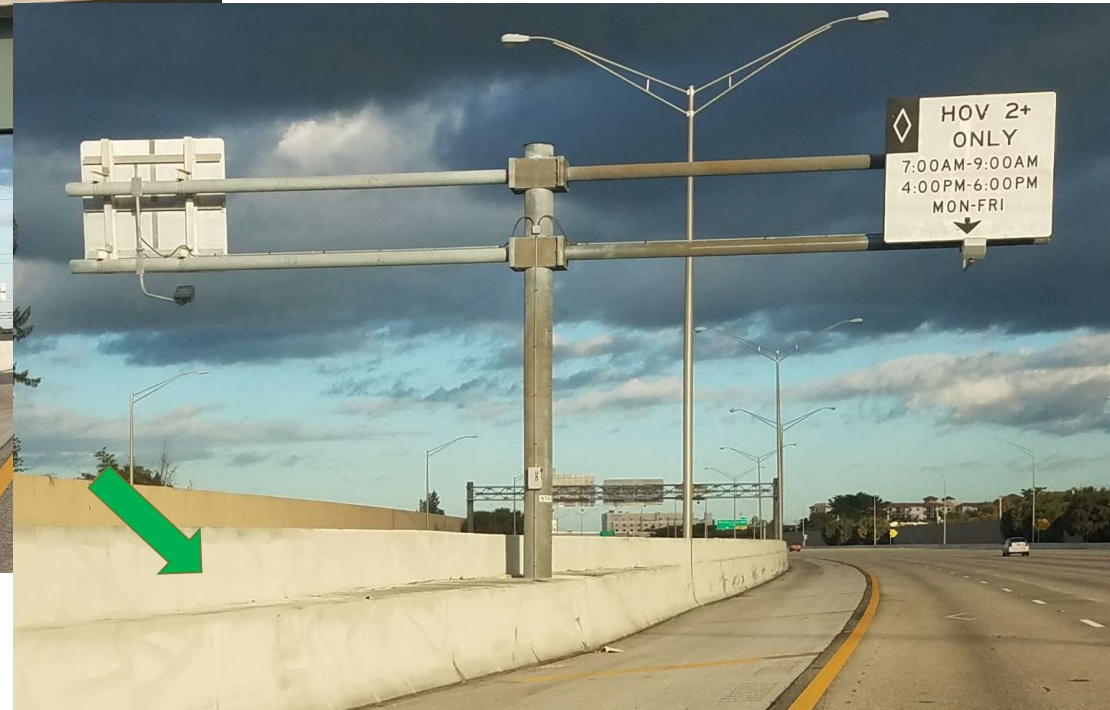
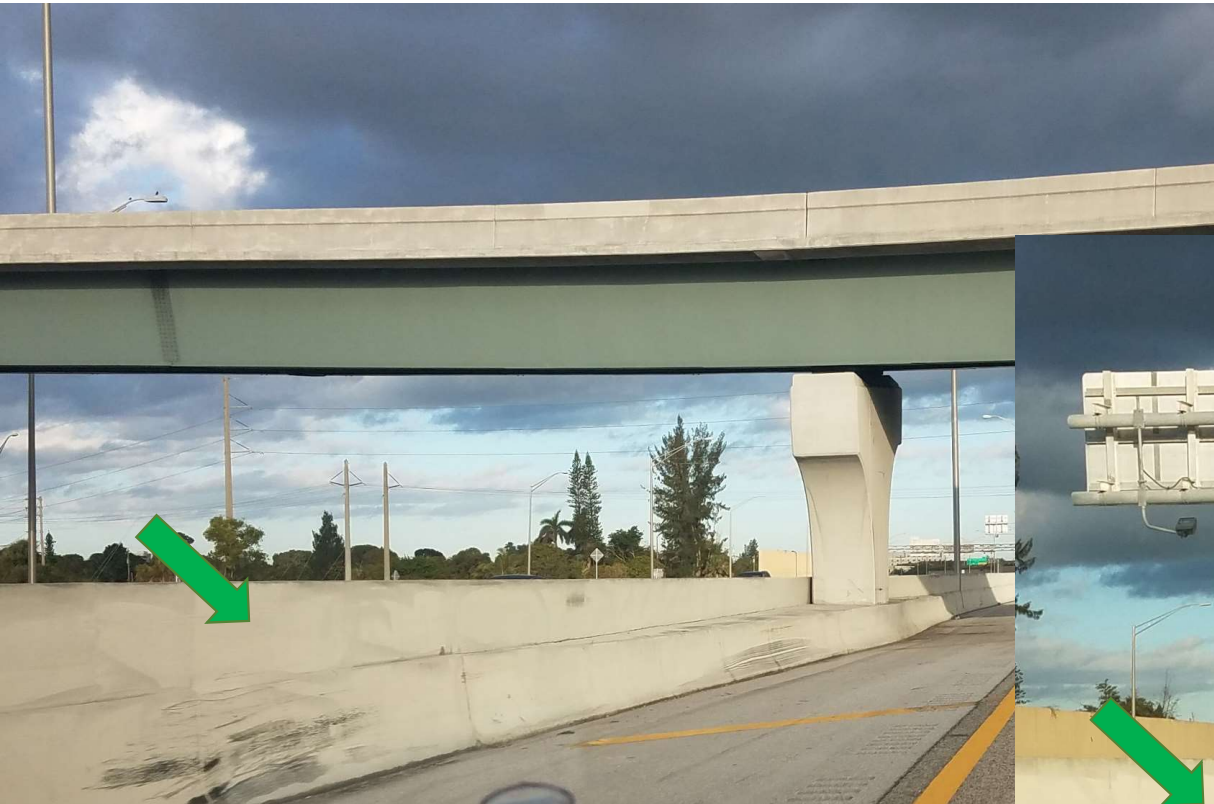
Standard Plans – Primary Index Updates:

- ✓ **1) Index 536-001 – Guardrail**
 - New “Trailing Anchorage”
 - Updated Downstream Placement Policy

- ✓ **2) Index 521-001 – Concrete Barrier**
 - New Barrier-Mounted Sign Support Option – Dual Supports
 - New Callouts for “Variable Section Width” Start/Stop Points
 - New “Wall Shielding Barrier” & General “Max. Taper Rates”

- ➔ **3) Index 521-010 – Opaque Visual Barrier (OVB)**
 - Redeveloped Index Sheets for Clarity
 - Durability Improvements
 - Varying Barrier Heights
 - New SPI and FDM Section

Opaque Visual Barrier – Past Examples (Previous-Standard)



FDM: **New FDOT Design Manual Section****215.5.1.2 Opaque Visual Barrier**

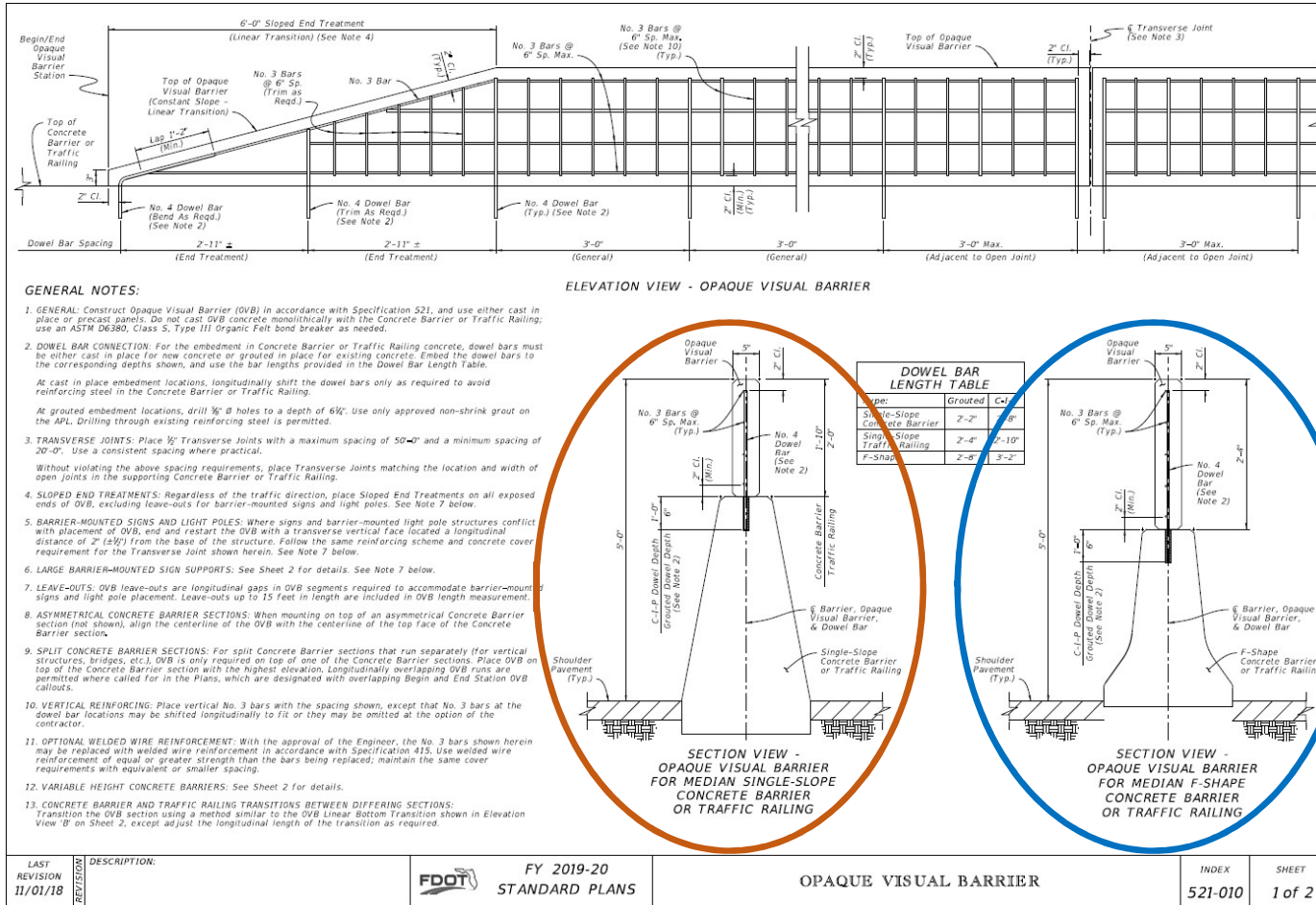
Opaque Visual Barrier is used on top of median concrete barrier and traffic railing to reduce headlight glare from opposing traffic lanes. Opaque Visual Barrier may be considered on LA Facilities that have glare issues when the facility has high-traffic volumes and a separation between opposing traffic lanes of 26 feet or less.

When Opaque Visual Barrier is used, a minimum shoulder width of 4 feet is required on both sides of the median concrete barrier or traffic railing.

[Standard Plans](#), *Index 521-010* and the associated *Standard Plans Instructions* provide additional information.

- **Usage Considerations:**
 - Remains a project-specific, District level decision
 - Guideline for LA Facilities... (see highlighted)
- **Usage Limitations:**
 - Median Barrier use only with min. 4 feet shoulder either side (Further explanation in SPI)

Sheet 1: Redeveloped OVB – New Heights and Features



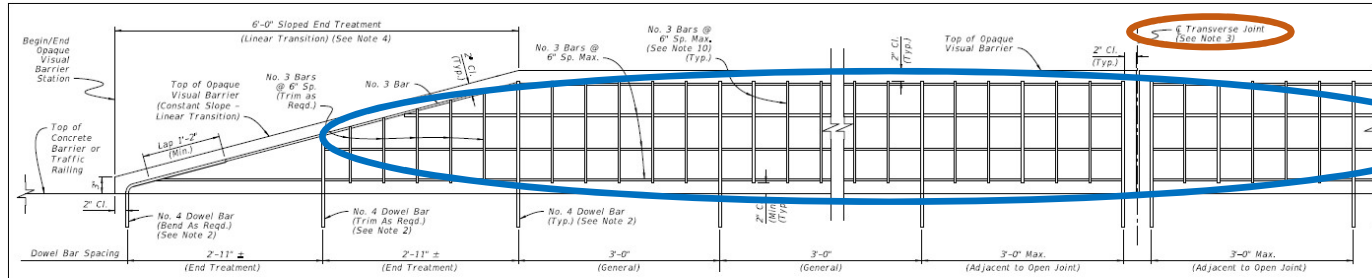
- Notes rewritten for clarity with new headings

- New OVB Heights: Now accommodates multiple cases:

- New Single-Slope Concrete Barrier & Bridge Traffic Railing
- Old F-Shape Barrier (Existing)

LAST REVISION 11/01/18	DESCRIPTION:	FDOT FY 2019-20 STANDARD PLANS	OPAQUE VISUAL BARRIER	INDEX 521-010	SHEET 1 of 2
---------------------------	--------------	--------------------------------------	-----------------------	------------------	-----------------

Sheet 1: Redeveloped OVB – New Heights and Features

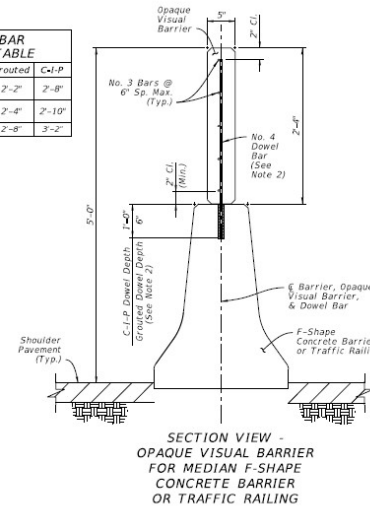
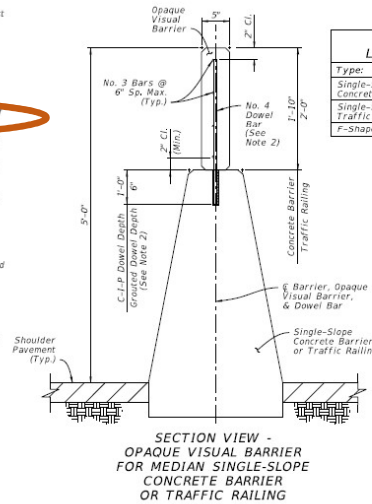


GENERAL NOTES:

1. GENERAL: Construct Opaque Visual Barrier (OVB) in accordance with Specification 521, and use either cast in place or precast panels. Do not cast OVB concrete monolithically with the Concrete Barrier or Traffic Railing; use an ASTM D6380, Class S, Type III Organic Felt bond breaker as needed.
2. DOWEL BAR CONNECTION: For the embedment in Concrete Barrier or Traffic Railing concrete, dowel bars must be either cast in place for new concrete or grouted in place for existing concrete. Embed the dowel bars to the corresponding depths shown, and use the bar lengths provided in the Dowel Bar Length Table.
3. TRANSVERSE JOINTS: Place 1/2" Transverse Joints with a maximum spacing of 50'-0" and a minimum spacing of 20'-0". Use a consistent spacing where practical.
4. SLOPED END TREATMENTS: Regardless of the traffic direction, place Sloped End Treatments on all exposed ends of OVB, excluding leave-outs for barrier-mounted signs and light poles. See Note 7 below.
5. BARRIER-MOUNTED SIGNS AND LIGHT POLES: Where signs and barrier-mounted light pole structures conflict with placement of OVB, end and restart the OVB with a transverse vertical face located a longitudinal distance of 2' (±6") from the base of the structure. Follow the same reinforcing scheme and concrete cover requirement for the Transverse Joint shown herein. See Note 7 below.
6. LARGE BARRIER-MOUNTED SIGN SUPPORTS: See Sheet 2 for details. See Note 7 below.
7. LEAVE-OUTS: OVB leave-outs are longitudinal gaps in OVB segments required to accommodate barrier-mounted signs and light pole placement. Leave-outs up to 15 feet in length are included in OVB length measurement.
8. ASYMMETRICAL CONCRETE BARRIER SECTIONS: When mounting on top of an asymmetrical Concrete Barrier section (not shown), align the centerline of the OVB with the centerline of the top face of the Concrete Barrier section.
9. SPLIT CONCRETE BARRIER SECTIONS: For split Concrete Barrier sections that run separately (for vertical structures, bridges, etc.), OVB is only required on top of one of the Concrete Barrier sections. Place OVB on top of the Concrete Barrier section with the highest elevation. Longitudinally overlapping OVB runs are permitted where called for in the Plans, which are designated with overlapping Begin and End Station OVB callouts.
10. VERTICAL REINFORCING: Place vertical No. 3 bars with the spacing shown, except that No. 3 bars at the dowel bar locations may be shifted longitudinally to fit or they may be omitted at the option of the contractor.
11. OPTIONAL WELDED WIRE REINFORCEMENT: With the approval of the Engineer, the No. 3 bars shown herein may be replaced with welded wire reinforcement in accordance with Specification 415. Use welded wire reinforcement of equal or greater strength than the bars being replaced; maintain the same cover requirements with equivalent or smaller spacing.
12. VARIABLE HEIGHT CONCRETE BARRIERS: See Sheet 2 for details.
13. CONCRETE BARRIER AND TRAFFIC RAILING TRANSITIONS BETWEEN DIFFERING SECTIONS: Transition the OVB section using a method similar to the OVB Linear Bottom Transition shown in Elevation View 'B' on Sheet 2, except adjust the longitudinal length of the transition as required.

ELEVATION VIEW - OPAQUE VISUAL BARRIER

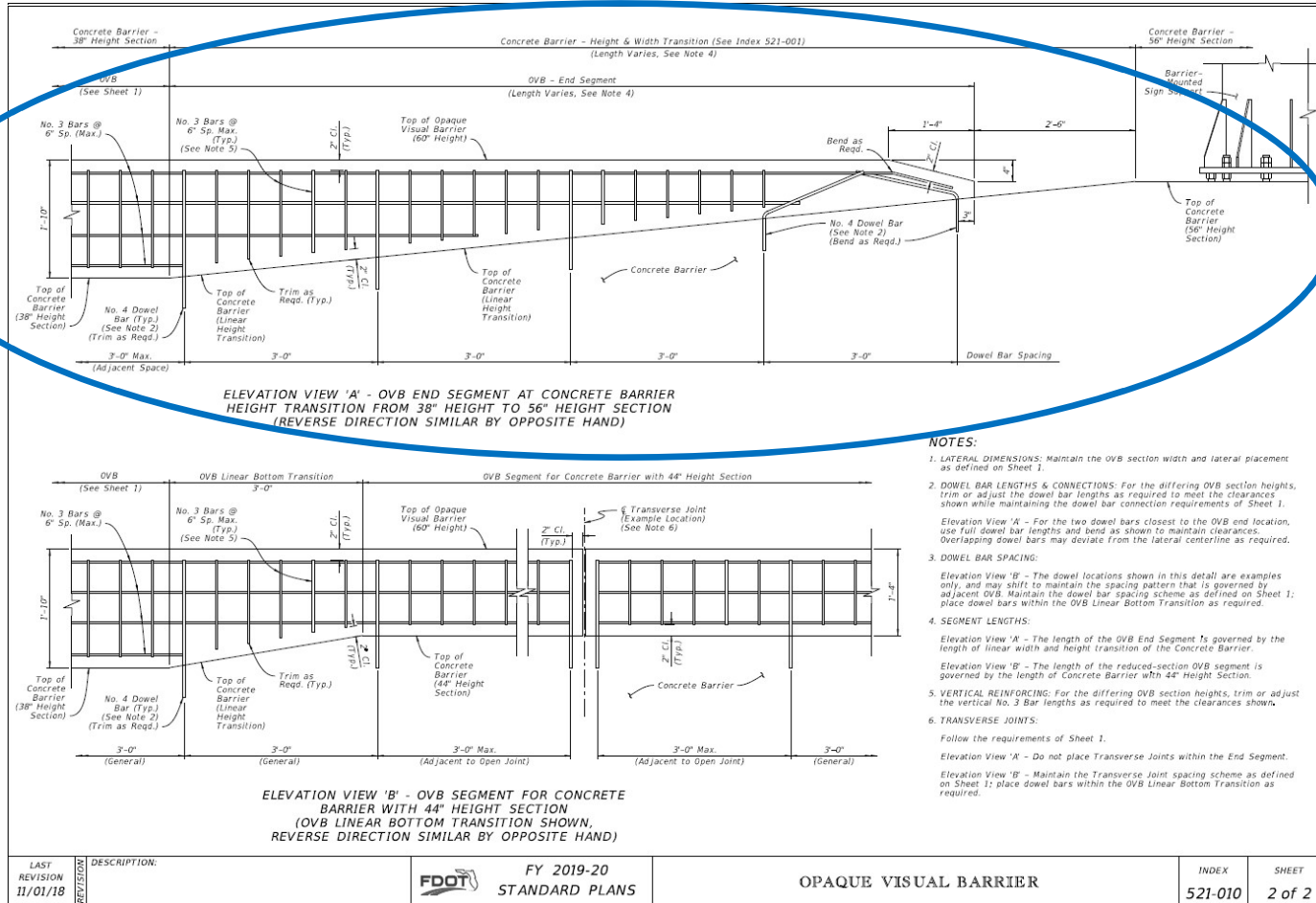
DOWEL BAR LENGTH TABLE		
Type:	Grouted	C&P
Single-Slope Concrete Barrier	2'-2"	2'-8"
Single-Slope Traffic Railing	2'-4"	2'-10"
F-Shape	2'-8"	3'-2"



- **Tighter Reinforcing:** web now 6" spacing
- **Longer Panel Lengths:** minimum joint spacing of 20 feet

LAST REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	OPAQUE VISUAL BARRIER	INDEX	SHEET
11/01/18					521-010	1 of 2

Sheet 2: **New Sheet – “Leave-Out” & Variable Height Details**



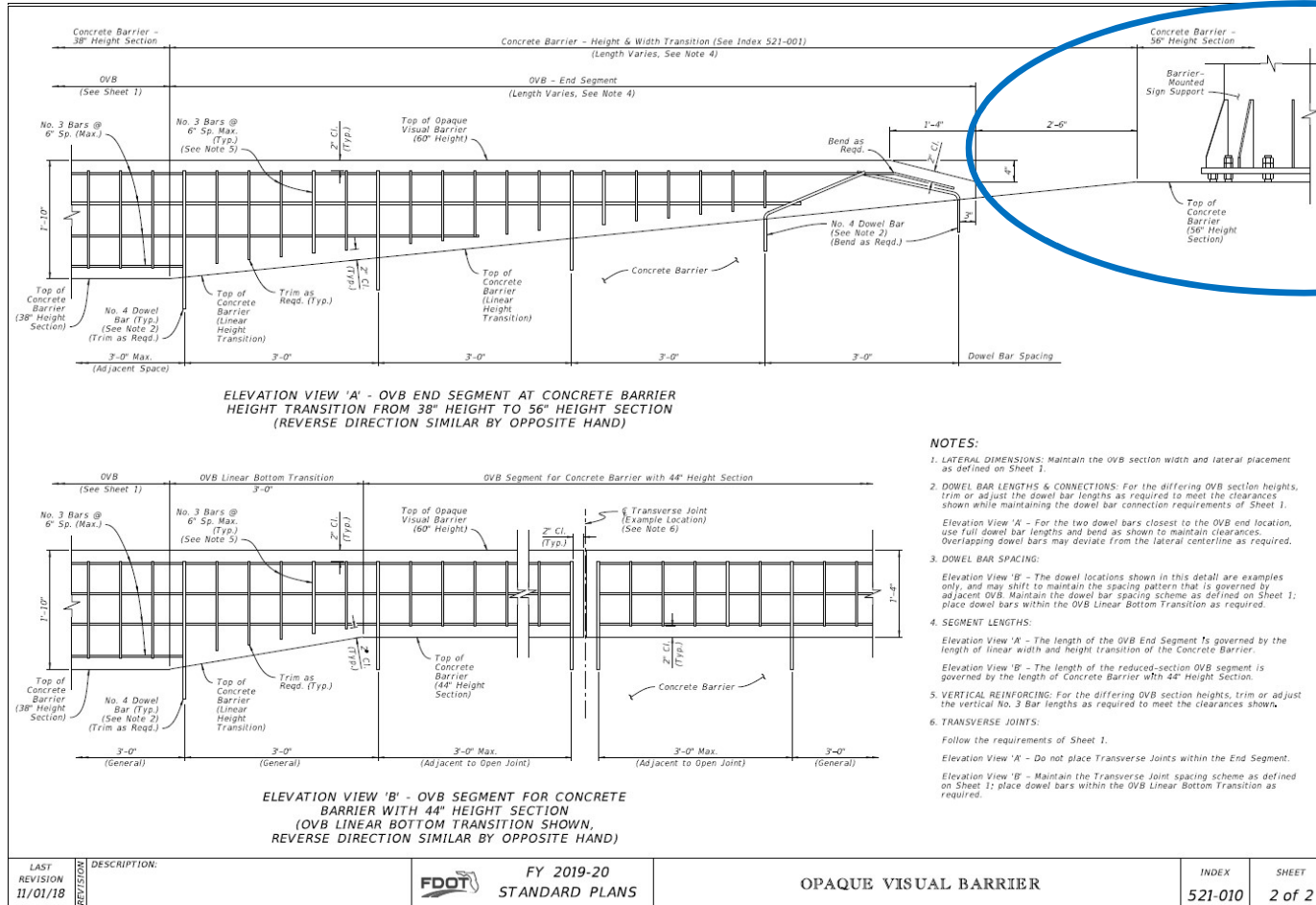
- Large Sign Support with 56" Height Barrier (per Index 521-001)

NOTES:

- LATERAL DIMENSIONS:** Maintain the OVB section width and lateral placement as defined on Sheet 1.
- DOWEL BAR LENGTHS & CONNECTIONS:** For the differing OVB section heights, trim or adjust the dowel bar lengths as required to meet the clearances shown while maintaining the dowel bar connection requirements of Sheet 1.
Elevation View 'A' - For the two dowel bars closest to the OVB end location, use full dowel bar lengths and bend as shown to maintain clearances. Overlapping dowel bars may deviate from the lateral centerline as required.
- DOWEL BAR SPACING:**
Elevation View 'B' - The dowel locations shown in this detail are examples only, and may shift to maintain the spacing pattern that is governed by adjacent OVB. Maintain the dowel bar spacing scheme as defined on Sheet 1; place dowel bars within the OVB Linear Bottom Transition as required.
- SEGMENT LENGTHS:**
Elevation View 'A' - The length of the OVB End Segment is governed by the length of linear width and height transition of the Concrete Barrier.
Elevation View 'B' - The length of the reduced-section OVB segment is governed by the length of Concrete Barrier with 44" Height Section.
- VERTICAL REINFORCING:** For the differing OVB section heights, trim or adjust the vertical No. 3 Bar lengths as required to meet the clearances shown.
- TRANSVERSE JOINTS:**
Follow the requirements of Sheet 1.
Elevation View 'A' - Do not place Transverse Joints within the End Segment.
Elevation View 'B' - Maintain the Transverse Joint spacing scheme as defined on Sheet 1; place dowel bars within the OVB Linear Bottom Transition as required.

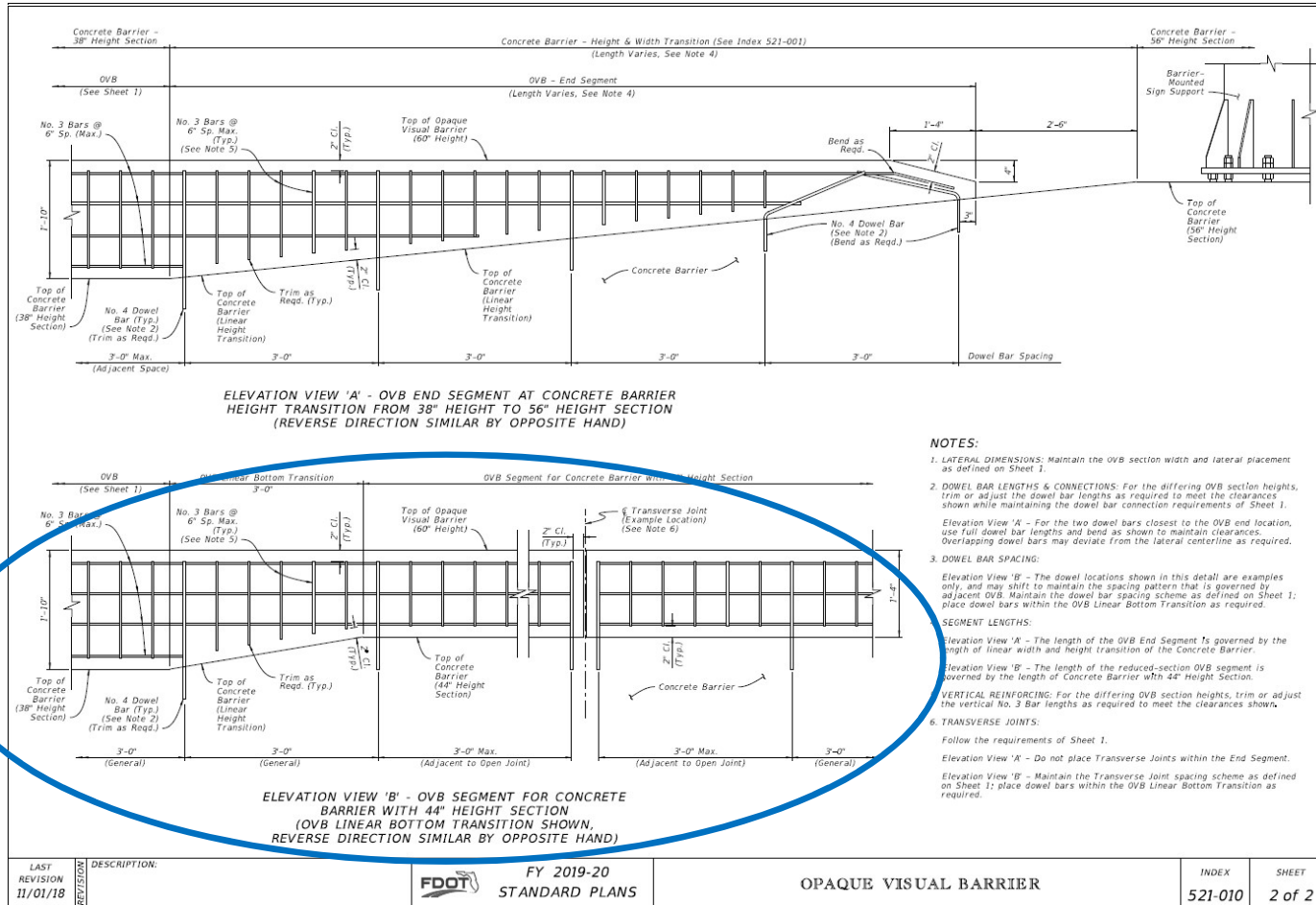
LAST REVISION 11/01/18	DESCRIPTION:		FY 2019-20 STANDARD PLANS	OPAQUE VISUAL BARRIER	INDEX 521-010	SHEET 2 of 2
---------------------------	--------------	--	------------------------------	-----------------------	------------------	-----------------

Sheet 2: **New Sheet – “Leave-Out” & Variable Height Details**



- **“Leave-Out” Example:** Per General Note 7, “Leave-Outs” of up to 15 feet are permitted with one continuous Pay Item measurement (to accommodate barrier-mounted signs and light poles)

Sheet 2: **New Sheet – “Leave-Out” & Variable Height Details**



- **Variable Heights:** Detail for OVB Panels over raised barrier height sections (Uses same Pay Item)

- Example here shows 44" Height Barrier with height transition (other heights and transitions similar)

LAST REVISION	DESCRIPTION	FY 2019-20	INDEX	SHEET
11/01/18		STANDARD PLANS	521-010	2 of 2

SPI: **New Standard Plans Instructions**

Standard Plans Instructions
Index 521-010 Opaque Visual Barrier

Topic No. 625-010-003
FY 2019-20

Index 521-010 Opaque Visual Barrier (OVB)

Design Criteria

FDOT Design Manual (*FDM*); AASHTO Roadside Design Guide, 4th Edition; NCHRP Synthesis of Highway Practice 66

Design Assumptions and Limitations

For usage information, see [FDM 215](#).

OVB is only intended for use as a visual screen; it is designed to withstand wind loading, light debris, and minor contact from errant vehicles.

OVB is not intended to resist or shield against errant vehicle impact loads; it is designed to yield upon large vehicle strikes.

A. Placement:

Per *Index 521-010*, align the centerline of the OVB with the centerline of the top face of the supporting Concrete Barrier or Traffic Railing.

Covers:

- Crash-worthiness design limitations
- General placement practices
- Callout locations (corresponds to Index drawing's Begin/End OVB Sta.)
- Pay Item information

Standard Plans – Primary Index Updates:

- ✓ 1) **Index 536-001 – Guardrail**
 - *New* “Trailing Anchorage”
 - Updated Downstream Placement Policy

- ✓ 2) **Index 521-001 – Concrete Barrier**
 - *New* Barrier-Mounted Sign Support Option – Dual Supports
 - *New* Callouts for “Variable Section Width” Start/Stop Points
 - *New* “Wall Shielding Barrier” & General “Max. Taper Rates”

- ✓ 3) **Index 521-010 – Opaque Visual Barrier (OVB)**
 - *Redeveloped* Index Sheets for Clarity
 - Durability Improvements
 - Varying Barrier Heights
 - *New* SPI and FDM Section

- ➔ 4) **Index 544-001 – Crash Cushion Details**
 - *Redeveloped* Index Sheets and SPI for Clarity
 - *Redeveloped* Summary of Permanent Crash Cushion Table
 - *New* Pay Items

544-001 is for "Permanent Crash Cushions" on the APL...



Sheet 1: *Redeveloped – Updated Design Process*

GENERAL NOTES:

1. GENERAL: Work this Index in accordance with Specification 544 and the "Summary of Permanent Crash Cushions" table in the Plans.
2. TRANSITION PANEL: Where crash cushions are placed between two-way traffic or adjacent to two-way two-lane traffic, place a Transition Panel from the Concrete Barrier to the Crash Cushion on the downstream side of the barrier end (as shown). Follow the requirements of the APL drawing.
3. MANUFACTURER'S TRANSITION: Construct the proprietary guardrail transition only if shown in the applicable APL drawing. See Note 4 below.
4. STANDARD GUARDRAIL TRANSITION: If the APL drawing does not provide a guardrail transition to w-beam guardrail, construct the Standard Guardrail Transition segment from three-beam to w-beam as shown per Sheet 2. This 21'-10 1/2" segment must remain parallel to the roadway.

If the APL drawing does provide a guardrail transition to w-beam guardrail, replace the Standard Guardrail Transition segment with a w-beam guardrail segment at 6'-3" post spacing, except that Post (10) will remain where shown herein if it is located at a guardrail begin or end taper station callout per the Plans. This 21'-10 1/2" segment must also remain parallel to the roadway.
5. LENGTH OF END TREATMENT: For Crash Cushions, the Length of End Treatment includes all proprietary elements of the design as shown in the APL drawing, including the manufacturer's transition of guardrail if applicable.

The actual Length of End Treatment varies per Crash Cushion type, but an estimated Length of End Treatment is generally shown in the Plans to provide sufficient space for the Contractor's option of differing Crash Cushion types.
6. LENGTH RESTRICTION: In the "Summary of Permanent Crash Cushions" table, if a value is provided in the Length Restriction column, then select a Crash Cushion from the APL which has a Length of End Treatment less than or equal to the value shown. If the table instead shows not applicable (N/A), then Crash Cushion selection is unrestricted regarding length.
7. CRASH CUSHION STATION: The Crash Cushion Station point shown herein corresponds to the station provided in the "Summary of Permanent Crash Cushions" table in the Plans.

CONCRETE BARRIER APPLICATION

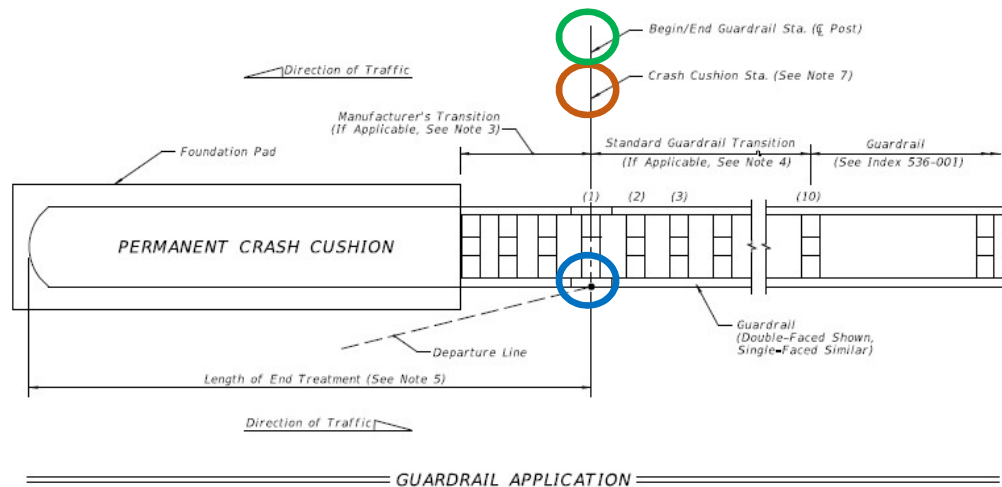
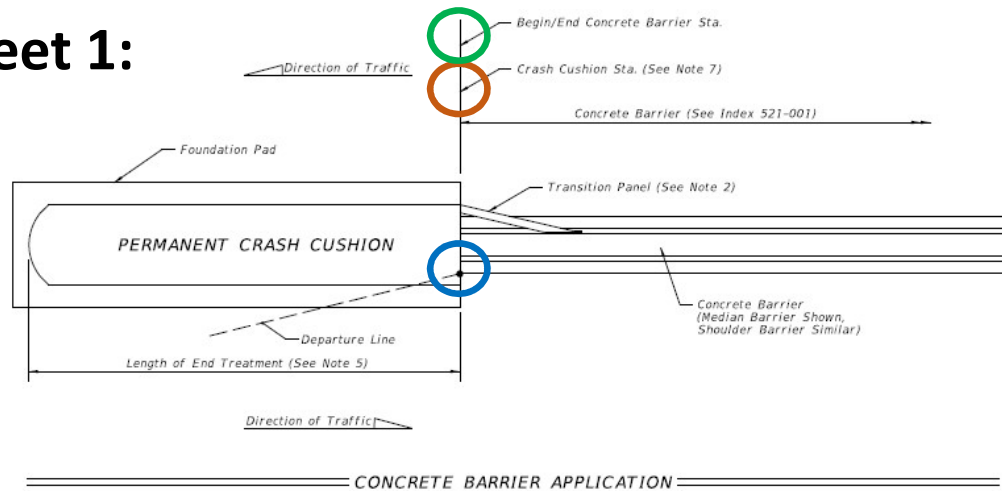
GUARDRAIL APPLICATION

PERMANENT CRASH CUSHION APPLICATIONS

- Drawings and Notes Redeveloped for Clarity
- “Length of Need” Process Simplified
- “Summary of Permanent Barrier Wall” Table Simplified
- Pay Item Updates

LAST REVISION 11/01/18	REVISION	DESCRIPTION:	FY 2019-20 STANDARD PLANS	CRASH CUSHION DETAILS	INDEX 544-001	SHEET 1 of 2
---------------------------	----------	--------------	------------------------------	-----------------------	------------------	-----------------

Sheet 1:

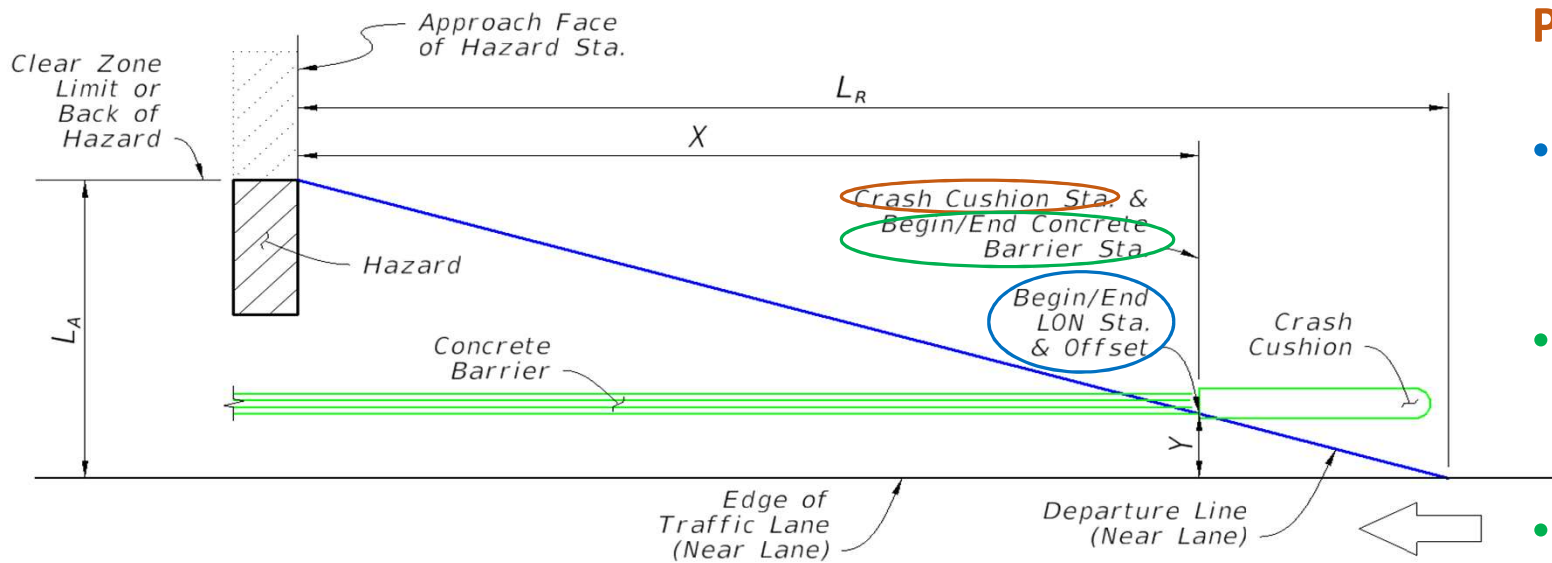


First Concept:

Crash Cushion Callout Point is the same as the:

- 'Length of Need' Location
- Begin/End Guardrail Station or...
- Begin/End Concrete Barrier Station

Concrete Barrier LON Design Tool (Excel):

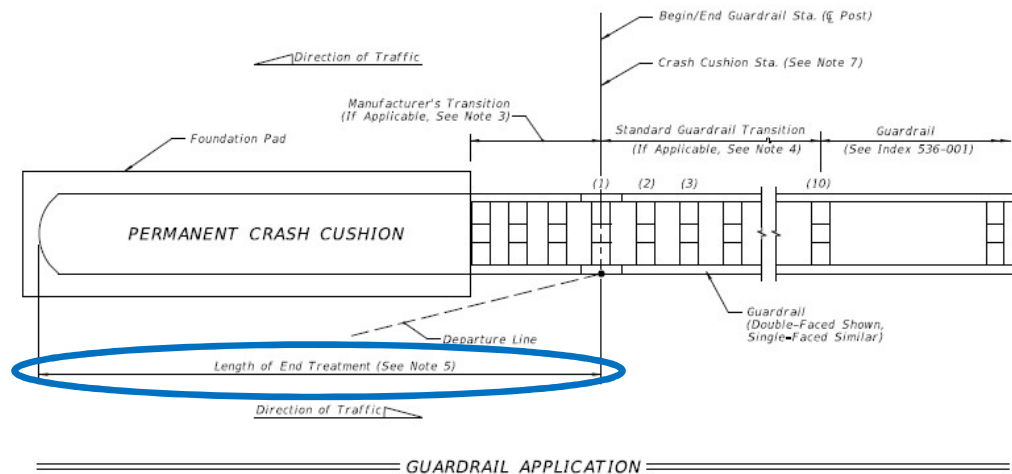
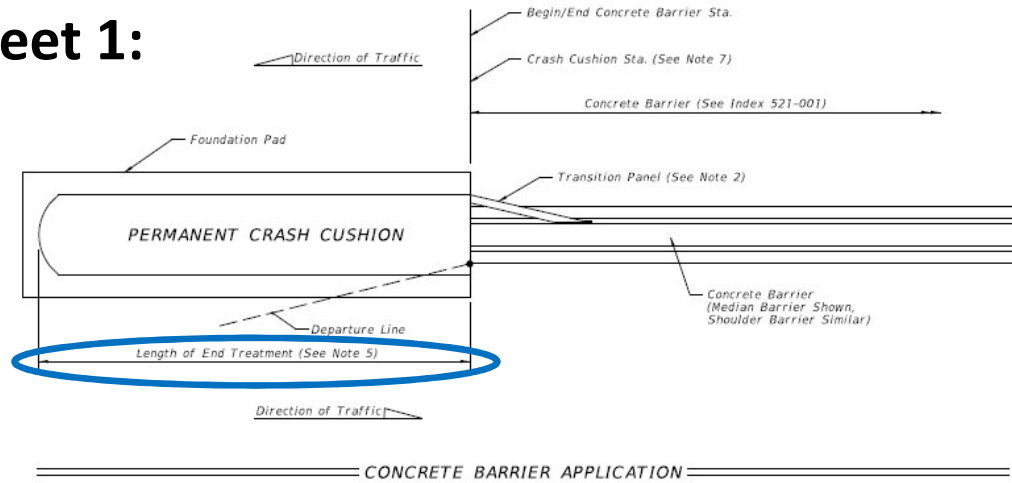


First Concept:

Crash Cushion Callout Point is the same as the:

- 'Length of Need' Location
- Begin/End Guardrail Station or...
- Begin/End Concrete Barrier Station

Sheet 1:

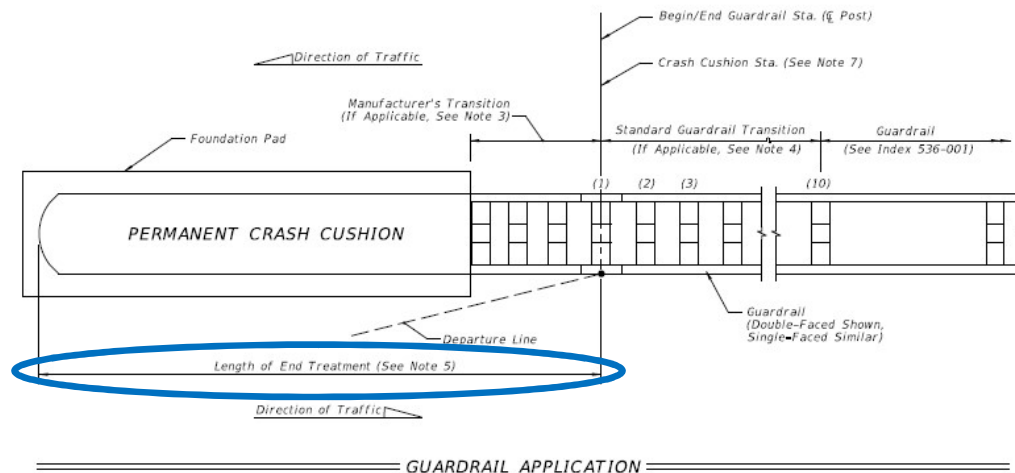
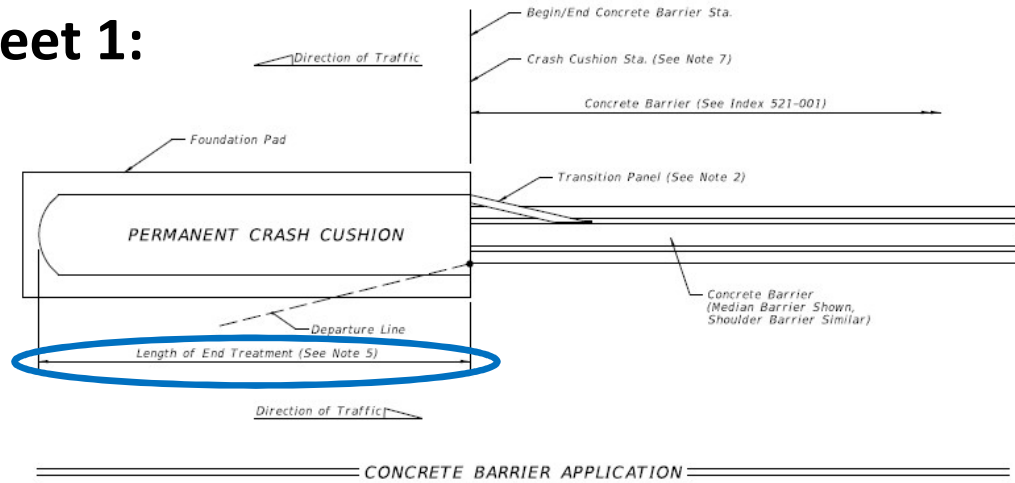


Second Concept:

‘Length of End Treatment’ – Segment upstream of the connecting Concrete Barrier or Guardrail...

- Includes all proprietary elements required per the APL drawings
- For Guardrail, this includes the *“Manufacturer’s Transition”*

Sheet 1:



Second Concept:

‘Length of End Treatment’ – Segment upstream of the connecting Concrete Barrier or Guardrail...

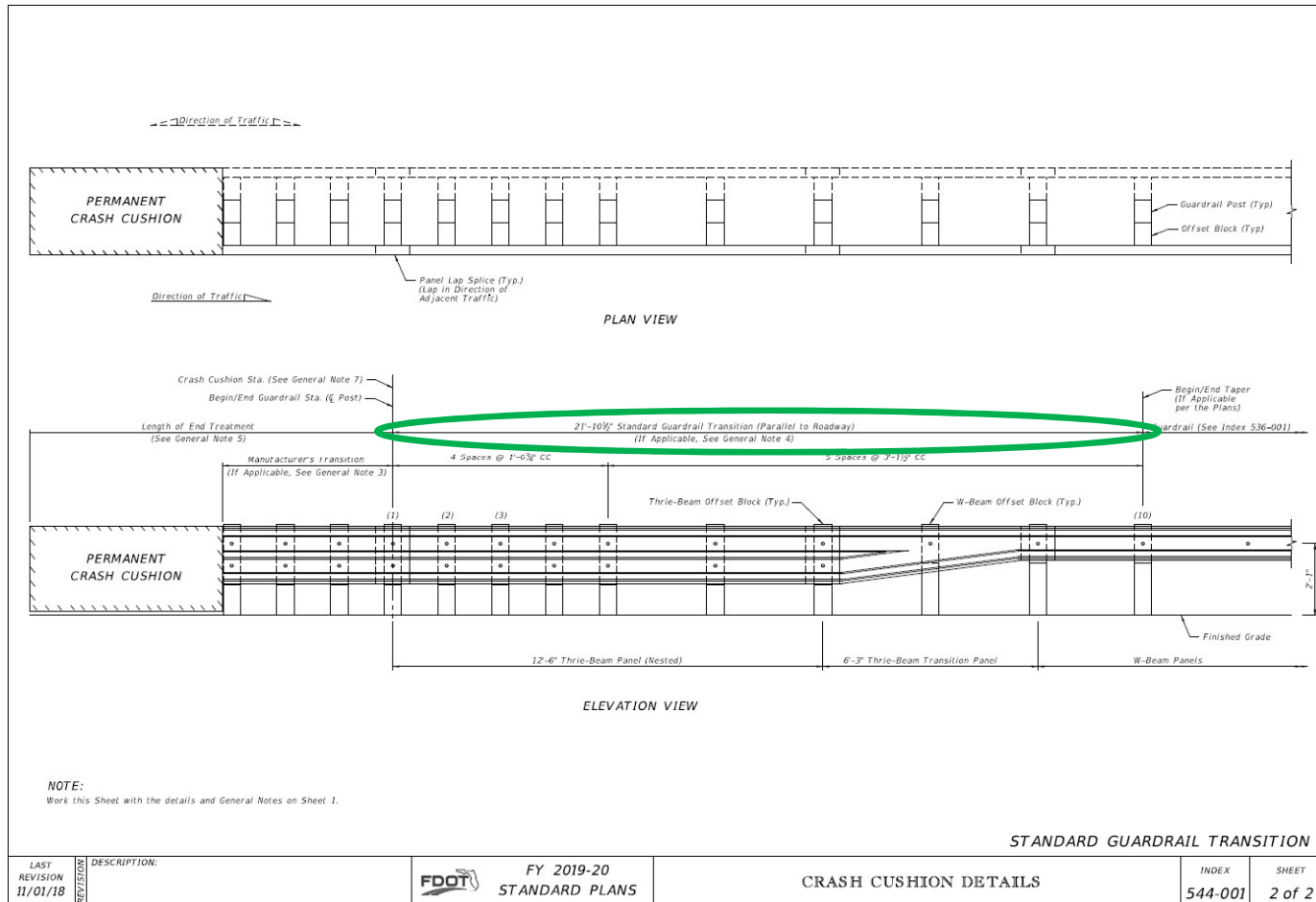
- Length varies by type and manufacturer
- **Default length** for designers is **27'-6"** (to accommodate contractor's choice)
See SPI Part D

Sheet 2: *Redeveloped* – Standard Guardrail Transition

Third Concept:

'Standard Guardrail Transition'

- Always a required parallel segment that is 21'-10½" Long
- This post and panel configuration may change depending on Manufacturer's needs, but for Designer's planning, the segment is always parallel to roadway and 21'-10½".



**'LON' Design
Tool (Excel):**

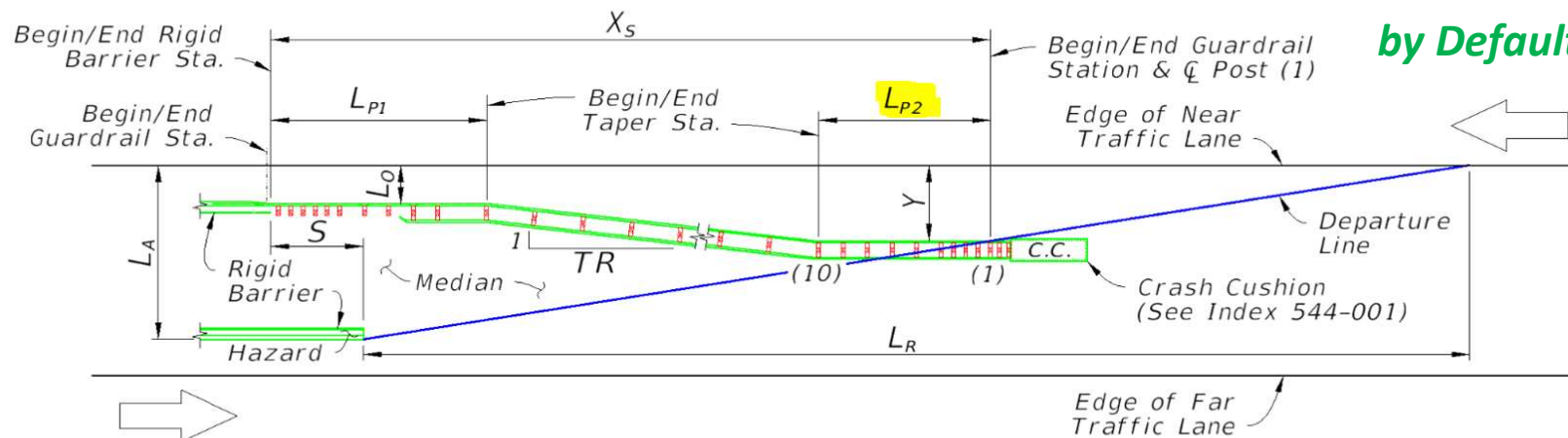
Redeveloped – Standard Guardrail Transition

Third Concept:

'Standard Guardrail Transition'

- L_{p2} = 'Length of Standard Guardrail Transition' by Default!

PART C: CROSSOVER GUARDRAIL WITH 'CRASH CUSHION' - SHIELDING CONCRETE RAILING ACROSS MEDIAN (WITHIN CLEAR ZONE)

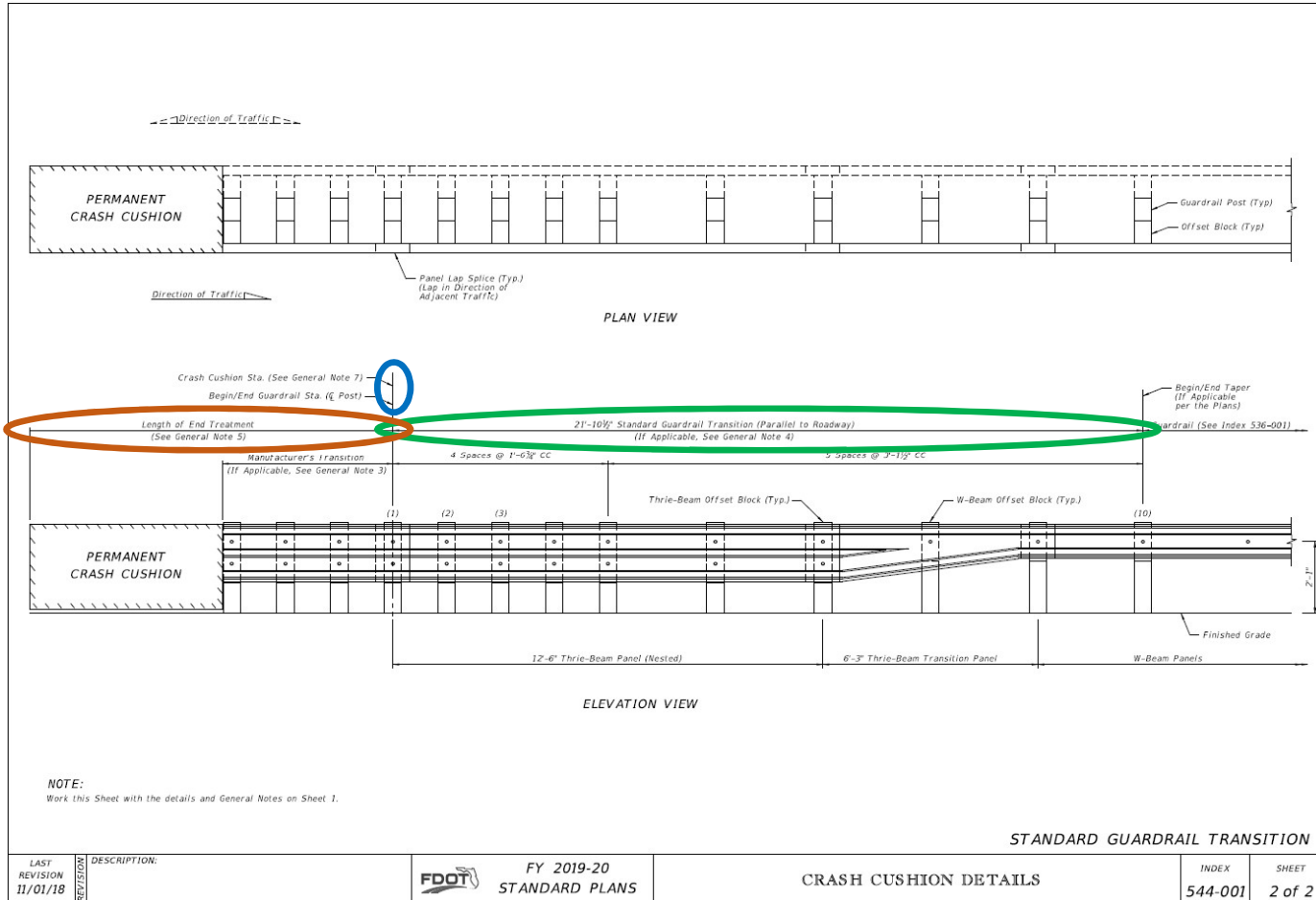


Parallel C.C. Trans. Length, L_{p2} (Ft.)	21.9	the length of the parallel segment required for Guardrail Transition, just beyond the taper. This is the length between Post (1) and Post (10) per Index 544-001 (21.9 Ft.)
---	------	---

Sheet 2: *Redeveloped* – Standard Guardrail Transition

Reminders!:

- ‘Standard Guardrail Transition’ is downstream of ‘LON’ point
- ‘Begin/End Guardrail Station,’ ‘Crash Cushion Station,’ and ‘LON’ point
- The ‘Length of End Treatment’ Treatment is upstream of the ‘LON’ point (27’-6” default)



SPI: *Redeveloped Standard Plans Instructions*

Standard Plans Instructions
Index 544-001 Crash Cushion Details

Topic No. 625-010-003
FY 2019-20

Index 544-001 Crash Cushion Details

Design Criteria

AASHTO Roadside Design Guide 4th Edition 2011; **FDOT Design Manual (FDM)**, *FDM 215*; *AASHTO Manual for Assessing Safety Hardware, MASH 2016*

Design Assumptions and Limitations

Index 544-001 is only applicable for permanent crash cushion installations which shield the ends of Concrete Barrier and Guardrail.

For general usage information for crash cushions, see **FDM 215**. For a listing of crash cushion types and the corresponding usage limitations, see the Approved Products List (APL) webpage.

A. Location:

A crash cushion is located by the Crash Cushion Station, which corresponds the end station of the connecting barrier. See the drawings in **Index 544-001** for a depiction of the Crash Cushion Station for guardrail and concrete barrier connections.

Crash cushions are typically placed to shield the ends of barrier systems that are either providing median crossover protection or shielding against a hazard per Part B below.

Topics Covered:

- A. 'Location' of callout station
- B. 'Length of Need' process
- C. 'Test Level' selection
- D. 'System Width' selection
- E. 'Length of End Treatment' (default value 27'-6")
- F. 'Constrained Conditions' (Methods for Reducing Space Needed for Crash Cushions)
- G. 'Temporary Crash Cushions' (where to look for more info)
- H. 'Alternative Crash Cushion Usage' (not barrier ends)

SPI: *Redeveloped Standard Plans Instructions*

Old Pay Item:

~~544-75- AA~~ Crash Cushion, EA

AA= Type

1 (Optional) PENDING: Valid through 6-30-2019 lettings; replaced by 544-2- or 544-3- items.

New Pay Items:

➔ 544-2- Crash Cushion, TL-2, EA (45 mph or less)

A= Width

1 (Narrow)

2 (Wide)

➔ 544-3- Crash Cushion, TL-3, EA (Over 45 mph)

A= Width

1 (Narrow)

2 (Wide)

Per SPI, Part D:


- **“Narrow” system:** connects to barriers (or objects)...
24” width or less
- **“Wide” system:** connects to barriers (or objects)...
Over 24” width

SPI: *Redeveloped Standard Plans Instructions*

Plan Content Requirements

Summary Boxes:

Summarize the following information in the *Summary of Permanent Crash Cushions* table per the **BOE**, Chapter 8 (include "N/A" for categories that are not applicable):

1. *Location (Station and Side), See the Crash Cushion Station in **Index 544-001**
2. *Crash Cushion System Width (Narrow or Wide)
3. *Crash Test Level (TL-2 or TL-3)
4. *Barrier Width (Inches)
-  5. **Length Restriction (Based on site specific space constraints)

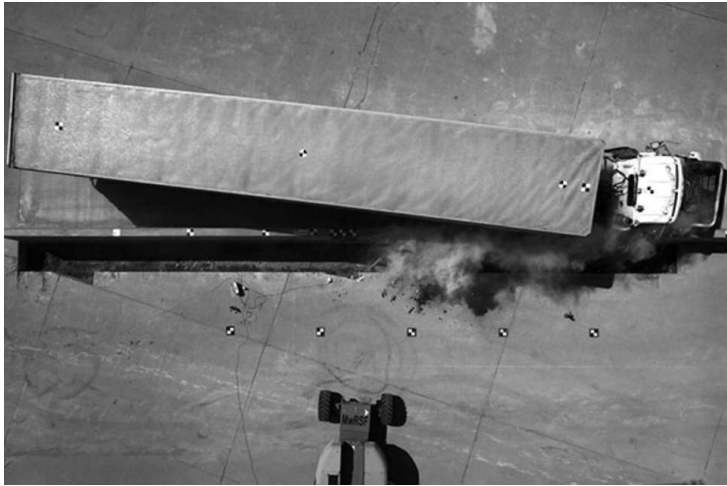
"LENGTH RESTRICTION":

Defined in SPI, Part F

If default crash cushion length of 27'-6" does not fit project, then contractors choice may be limited with a "Length Restriction"

SUMMARY OF PERMANENT CRASH CUSHIONS											
PAY ITEM NO.	PAY ITEM DESCRIPTION	LOCATION		BARRIER WIDTH	LENGTH RESTRICTION	QUANTITY (EA)		TOTAL		DESIGN NOTES	CONSTRUCTION REMARKS
		STATION	SIDE			IN	FT	P	F		





Questions?



Richard Stepp, P.E.
Standard Plans Engineer
Central Office, Roadway Design
(850) 414-4313
richard.stepp@dot.state.fl.us

FY 2019-20 Standard Plans Update Training

Ed Cashman, P.E.
Standard Plans Engineer
State Roadway Design Office
(850) 414-4314
edward.cashman@dot.state.fl.us

Standard Plans – Primary Updates

- ➔ **1) *Temporary Traffic Control Indexes***
 - a) Index 102-600 – General Information for Traffic Control Through Work Zones*
 - b) Index 102-655 – Traffic Pacing*
- 2) *Signal, Signing & Pavement Marking Indexes***
- 3) *Lighting Indexes***



General Information for Traffic Control Through Work Zones, Index 102-600

Sheet 3 of 12

CLEAR ZONE WIDTHS FOR WORK ZONES

The term 'clear zone' describes the unobstructed relatively flat area, impacted by construction, extending outward from the edge of the traffic lane. The table below gives clear zone widths in work zones for medians and roadside conditions other than for roadside canals; where roadside canals are present, clear zone widths are to conform with the distances to canals as described in the FDOT Design Manual 215.2.

CLEAR ZONE WIDTHS FOR WORK ZONES		
WORK ZONE SPEED (MPH)	TRAVEL LANES & MULTILANE RAMPS (feet)	AUXILIARY LANES & SINGLE LANE RAMPS (feet)
60-70	30	18
55	24	14
45-50	18	10
30-40	14	10
ALL SPEEDS CURB & GUTTER	4' BEHIND FACE OF CURB	4' BEHIND FACE OF CURB

SUPERELEVATION

Horizontal curves constructed in conjunction with work zone traffic control should have the required superelevation applied to the design radii. Under conditions where normal crown controls curvature, the minimum radii that can be applied are listed in the table below.

MINIMUM RADII FOR NORMAL CROWN	
WORK ZONE POSTED SPEED	MINIMUM RADIUS
MPH	Feet
70	4090
65	3120
60	2400
55	1940
50	1390
45	1080
40	820
35	610
30	430
Superelevate When Smaller Radii is Used	

LENGTH OF LANE CLOSURES

For interstates and state highways with a posted speed of 55MPH or greater, lane closures must not exceed 3 miles (includes taper, buffer, and work zone) in any given direction and must not close two consecutive interchanges.

OVERWEIGHT/OVERSIZE VEHICLES

Restrictions to Lane Widths, Heights or Load Capacity can greatly impact the movement of over dimensioned loads. The Contractor shall notify the Engineer who in turn shall notify the State Permits Office, phone no. (850) 410-5777, at least seven calendar days in advance of implementing a maintenance of traffic plan which will impact the flow of overweight/oversize vehicles. Information provided shall include location, type of restriction (height, width or weight) and restriction time frames. When the roadway is restored to normal service the State Permits Office shall be notified immediately.

LANE WIDTHS

Lane widths of through roadways should be maintained through work zone travel ways wherever practical. The minimum widths for work zone travel lanes shall be as follows: 11' for Interstate with at least one 12' lane provided in each direction, unless formally excepted by the Federal Highway Administration; 11' for Freeways; and 10' for all other facilities.

HIGH-VISIBILITY SAFETY APPAREL

All high-visibility safety apparel shall meet the requirements of the International Safety Equipment Association (ISEA) and the American National Standards Institute (ANSI) for "High-visibility Safety Apparel", and labeled as ANSI/ISEA 107-2004 or newer. The apparel background (outer) material color shall be either fluorescent orange-red or fluorescent yellow-green as defined by the standard. The retroreflective material shall be orange, yellow, white, silver, yellow-green, or a fluorescent version of those colors, and shall be visible at a minimum distance of 1,000 feet. Class 3 apparel may be substituted for Class 2 apparel. Replace apparel that is not visible at 1,000 feet.

WORKERS: All workers within the right-of-way shall wear ANSI/ISEA Class 2 apparel. Workers operating machinery or equipment in which loose clothing could become entangled during operation shall wear fitted high-visibility safety apparel. Workers inside the bucket of a bucket truck are not required to wear high-visibility safety apparel.

UTILITIES: When other industry apparel safety standards require utility workers to wear apparel that is inconsistent with FDOT requirements such as NFPA, OSHA, ANSI, etc., the other standards for apparel may prevail.

FLAGGERS: For daytime activities, flaggers shall wear ANSI/ISEA Class 2 apparel. For nighttime activities, flaggers shall wear ANSI/ISEA Class 3 apparel.

REGULATORY SPEEDS IN WORK ZONES

Traffic Control Plans (TCPs) for all projects must include specific regulatory speeds for each phase of work. This can either be the posted speed or a reduced speed. The speed shall be noted in the TCPs; this includes indicating the existing speed if no reduction is to be made. Regulatory speeds are to be uniformly established through each phase.

In general, the regulatory speed should be established to route vehicles safely through the work zone as close as to normal highway speed as possible. The regulatory speed should not be reduced more than 10 mph below the posted speed and never below the minimum statutory speed for the class of facility. When a speed reduction greater than 10 mph is imposed, the reduction is to be done in 10 mph per 300' increments.

Temporary regulatory speed signs shall be removed as soon as the conditions requiring the reduced speed no longer exist. Once the work zone regulatory speeds are removed, the regulatory speed existing prior to construction will automatically go back into effect unless new speed limit signing is provided for in the plans.

On projects with interspaced work activities, speed reductions should be located in proximity to those activities which merit a reduced speed, and not "blanketed" for the entire project. At the departure of such activities, the normal highway speed should be posted to give the motorist notice that normal speed can be resumed.

If the existing regulatory speed is to be used, consideration should be given to supplementing the existing signs when the construction work zone is between existing regulatory speed signs. For projects where the reduced speed conditions exist for greater than 1 mile in rural areas (non-interstate) and on rural or urban interstate, additional regulatory speed signs are to be placed at no more than 1 mile intervals. Engineering judgement should be used in placement of the additional signs. Locating these signs beyond ramp entrances and beyond major intersections are examples of proper placement. For urban situations (non-interstate), additional speed signs are to be placed at a maximum of 1000' apart.

When field conditions warrant speed reductions different from those shown in the TCP the contractor may submit to the project engineer for approval by the Department, a signed and sealed study to justify the need for further reducing the posted speed, or, the engineer may request the District Traffic Operations Engineer (DTOE) to investigate the need. It will not be necessary for the DTOE to issue regulations for regulatory speeds in work zones due to the revised provisions of F.S. 316.0745(2)(b). Advisory Speed zones will be used at the option of the field engineer for temporary use while processing a request to change the regulatory speed specified in the plans when deemed necessary. Advisory speed plates cannot be used alone but must be placed below the construction warning sign for which the advisory speed is required.

For additional information, refer to the Plans Preparation Manual, Volume I, Chapter 10.

Changed the maximum lane closure length to three miles for high-speed facilities



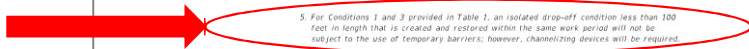
LAST REVISION 11/01/18	DESCRIPTION:	FDOT FY 2019-20 STANDARD PLANS	GENERAL INFORMATION FOR TRAFFIC CONTROL THROUGH WORK ZONES	INDEX 102-600	SHEET 3 of 12
---------------------------	--------------	--------------------------------------	--	------------------	------------------

Old:

5. For Conditions 1 and 3 provided in Table 1, any drop-off condition that is created and restored within the same work period will not be subject to the use of temporary barriers; however, channelizing devices will be required.

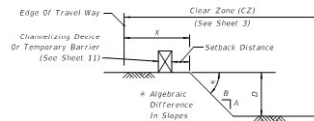
New:

5. For Conditions 1 and 3 provided in Table 1, an isolated drop-off condition less than 100 feet in length that is created and restored within the same work period will not be subject to the use of temporary barriers; however, channelizing devices will be required.



DROP-OFF CONDITION NOTES

- These conditions and treatments can be applied only in work areas that fall within a properly signed work zone.
- When drop-offs occur within the clear zone due to construction or maintenance activities, protection devices are required (See Table 1). A drop-off is defined as a drop in elevation, parallel to the adjacent travel lanes, greater than 3" with slope (AB) steeper than 1:4. In superelevated sections, the algebraic difference in slopes should not exceed 0.25 (See Drop-off Condition Detail).
- Drop-offs may be mitigated by placement of slopes with optional base material per Specifications Section 285. Slopes shallower than 1:4 may be required to avoid algebraic difference in slopes greater than 0.25. Include the cost for the placement and removal of the material in Maintenance of Traffic, LSD. Use of this treatment in lieu of a temporary barrier is not eligible for CSIP consideration. Conduct daily inspections for deficiencies related to erosion, excessive slopes, rutting or other adverse conditions. Repair any deficiencies immediately.
- For Setback Distance, refer to the Index or Approved Products List (APL) drawing of the selected barrier.
- For Conditions 1 and 3 provided in Table 1, an isolated drop-off condition less than 100 feet in length that is created and restored within the same work period will not be subject to the use of temporary barriers; however, channelizing devices will be required.
- When permanent curb heights are $\geq 6'$, no channelizing device will be required. For curb heights $< 6'$, see Table 1.



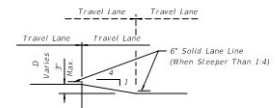
DROP-OFF CONDITION DETAIL

Table 1
Drop-off Protection Requirements

Condition	X (ft)	D (in.)	Device Required
1	0-12	> 3	Temporary Barrier
2	≥ 12 -CZ	> 3 to ≤ 5	Channelizing Device
3	0-CZ	> 5	Temporary Barrier
4	Removal of Bridge or Retaining Wall Barrier		Temporary Barrier
5	Removal of portions of Bridge Deck		Temporary Barrier

TRAVEL LANE TREATMENT FOR MILLING OR RESURFACING NOTES

- This treatment applies to resurfacing or milling operations between adjacent travel lanes.
- Whenever there is a difference in elevation between adjacent travel lanes, the W8-11 sign with "UNEVEN LANES" is required at intervals of $\frac{1}{2}$ mile maximum.
- If D is 10" or less, no treatment is required.
- Treatment allowed only when D is 3" or less.
- If the slope is steeper than 1:4 (not to be steeper than 1:1), the R4-1 and M07-1-06 signs shall be used as a supplement to the W8-11; this condition should never exceed 3 miles in length.



TRAVEL LANE TREATMENT FOR MILLING OR RESURFACING DETAIL

PEDESTRIAN WAY DROP-OFF CONDITION NOTES

- A pedestrian way drop-off is defined as:
 - a drop in elevation greater than 10" that is closer than 2' from the edge of the pedestrian way
 - a slope steeper than 1:2 that begins closer than 2' from the edge of the pedestrian way when the total drop-off is greater than 60"
- Protect any drop-off adjacent to a pedestrian way with pedestrian longitudinal channelizing devices, temporary barrier wall, or approved handrail.

DROP-OFFS IN WORK ZONES

LAST REVISION	DESCRIPTION
11/01/18	

TRAFFIC PACING GUIDE

Traffic pacing is a traffic control technique to slow but not stop traffic to facilitate short duration work operations without an elaborate and difficult detour or diversion. Traffic Control Officers pace or slow the traffic to a speed that provides approximately 20-30 minutes to perform the work operation. The Department has frequently used this technique for setting bridge beams, overhead sign structures and replacing overhead sign panels.

NOTICE

This Index represents the minimum requirements for traffic pacing operations on the State Highway System.
Develop a site specific traffic control plan for each pacing operation location.

CHANGEABLE MESSAGE SIGNS (Typical Placement and Messages)

L = Length of Traffic Pacing Operation

CHANGEABLE MESSAGE SIGN MESSAGE (MAINLINE AND RAMP)

	ONE WEEK PRIOR TO PACING OPERATION	DURING DAY OF PACING OPERATION	DURING PACING OPERATION
Symbols <ul style="list-style-type: none"> ■ Channelizing Device (See Index 102-600) Marked Police Vehicle with Flashing Blue Lights PCMS, Portable Changeable Message Sign ☑ To be placed the day of pacing operation ⇄ Lane Identification and Direction of Traffic 	EXPECT DELAYS ON	ROAD WORK TONIGHT	SLOW TRAFFIC AHEAD
	MMN DD-DD X AM - X AM	EXPECT PERIODIC DELAYS	BE PREPARED TO STOP

TRAFFIC PACING GENERAL NOTES

1. Install ROAD CLOSED (W20-3) signs approximately 1000' prior to the work area. These signs shall remain covered until the pacing operation begins and covered when the pacing operation has ended.
2. Prior to requesting that the traffic control officer supervisor initiate the pacing operation, the contractor shall ensure that the necessary equipment is properly positioned (off the roadway) for the construction activity requiring the traffic pacing operation.
3. Truck mounted attenuator(s) with changeable message sign(s) are required to protect workers and/or equipment positioned in a travel lane(s) at the work area during the pacing operation from an errant vehicle. If no workers and/or equipment are positioned in a travel lane(s) at the work area, truck mounted attenuator(s) are not required.
4. A traffic control officer supervisor shall be stationed at the work area continuously throughout the pacing operation to insure radio communications between the contractor and/or the project administrator, and all the police vehicles involved in the pacing operation.
5. When more than one pacing operation is required in one work period the contractor shall allow sufficient time between pacing operations to permit traffic to return to normal speeds and flow. Additional time may be required between pacing operations to allow traffic to resume normal speeds and flow upstream of the work area as determined by the project administrator or traffic control officer supervisor.
6. For work durations of less than five minutes, coordinate with traffic control officer to provide resources necessary for pacing traffic. Portable changeable message signs, truck-mounted attenuators, ROAD CLOSED signs, and site specific traffic control plans are not required for such operations. Use traffic pacing distance values from the five minute column of the table on Sheet 3.

TRAFFIC CONTROL PLANS OR TECHNICAL SPECIFICATION

1. The specific activities and locations, along with allowable times of day and days of the week, when pacing will be allowed should be clearly detailed in the traffic control plans or technical specification. If there are specific holiday or special event dates that, due to anticipated traffic congestion, pacing operations should not be allowed, these dates should also be spelled out in plans or specifications. When detailing the specific activities and locations of pacing activities, identify the minimum number of traffic control officers needed for each function and location of the pacing operation. If there are certain work activities that need to be completed prior to the contractor starting the work anticipated during the pacing operation, the activities should be clearly detailed in the plans or technical specification.
2. When developing a pacing plan, failsafe "stop points" should be identified for those work operations in which a construction problem could create a condition that could not be immediately cleared. A failsafe stop point is the last safe egress from the highway facility prior to traffic coming upon the work that is being completed during the operation. In the unlikely event that the work is not completed during the time estimated for the pacing, the plans or specification should direct the pacing to not proceed past the failsafe stop point until the highway is cleared. In the event of major construction problem that cannot be immediately cleared, traffic can then be diverted off the facility.
3. The traffic control plans or technical specification should require the contractor to submit a pacing plan in advance of the operation. The pacing plan should outline the contractors expected equipment and personnel, outline the operation, and include a contingency plan should any of the contractor's critical equipment break down. If the project includes a damage recovery clause, the traffic control plan or technical specification should be clear that the damage recovery applies to the pacing operation as well.
4. Changeable message signs shall be displayed one week prior to work using messages described in the traffic pacing plan. The number and location of changeable message signs shall be called out in the traffic control plans.

← New

LAST REVISION 11/01/18	DESCRIPTION:		FY 2019-20 STANDARD PLANS	TRAFFIC PACING	INDEX 102-655	SHEET 1 of 3
---------------------------	--------------	--	------------------------------	----------------	------------------	-----------------

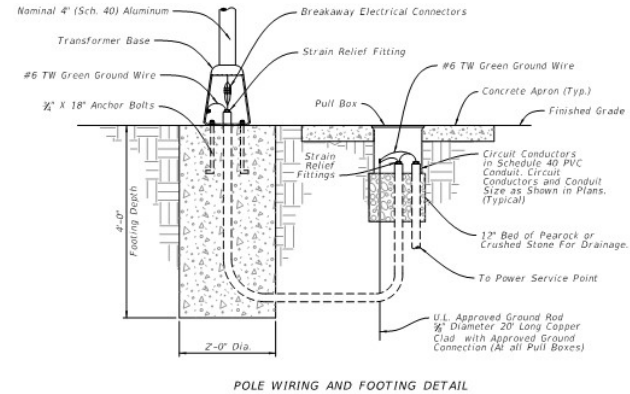
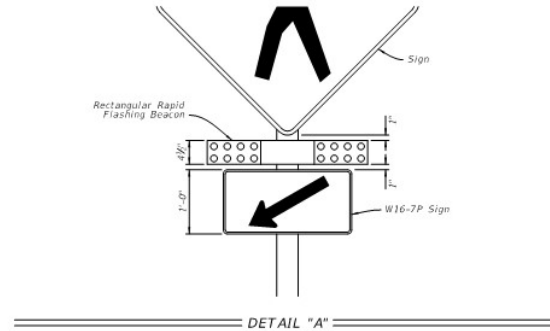
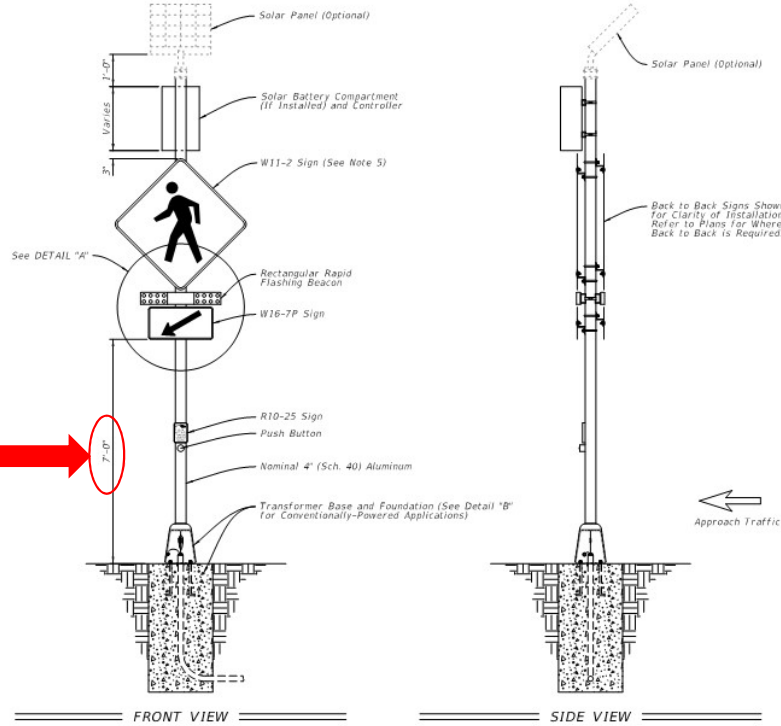
Standard Plans – Primary Updates

- 
1) *Temporary Traffic Control Indexes*
 - 2) *Signal, Signing & Pavement Marking Indexes***
 - a) Index 654-001 – Rectangular Rapid Flashing Beacon Assembly*
 - b) Index 700-102 – Special Sign Details*
 - c) Index 700-103 – Tourist Oriented Directional Signs*
 - d) Index 700-109 – Traffic Controls for Street Terminations*
 - e) Index 700-120 – Enhanced Highway Signing Assemblies*
 - f) Index 706-001 – Typical Placement of Raised Pavement Markers*
 - g) Index 711-001 – Pavement Markings*
 - 3) *Lighting Indexes***

New!

NOTES:

1. A transformer base is required for both conventionally-powered and solar-powered applications (conventional power shown).
2. Install the RRFB in pairs, one on either side of approach traffic.
3. Install controller on the backside of post from approach traffic.
4. Install a 30" X 30" W11-2 sign on two-lane roadways and a 36" X 36" W11-2 sign for multilane roadways.
5. Install push button and R10-25 sign in accordance with Index 665-001.
6. Engage all threads on the transformer base and post unless the aluminum post is fully seated into base.
7. Meet the requirements of Specifications 646 for aluminum poles and transformer bases.
8. Install a concrete slab around all pull boxes. The minimum slab dimension is 4'-0" by 4'-0". In urban areas where space is limited slab dimensions may be adjusted as shown in the Plans.
9. For assemblies connected to conventional power, provide single pole non-fused watertight breakaway electrical connectors in the fragilible transformer base.
10. When wire entry holes are drilled in the sign column, use a bushing or rubber grommet to protect conductors.
11. For solar-powered applications, orient solar panel to face South for optimal exposure to sunlight.



Changed →

LAST REVISION 11/01/18	DESCRIPTION: 	FY 2019-20 STANDARD PLANS	INDEX 654-001	SHEET 1 of 1
---------------------------	------------------	------------------------------	------------------	-----------------

RECTANGULAR RAPID FLASHING BEACON ASSEMBLY

<p>FTP-25-06 9" x 11"-0" 2" Radii 3/8" Border 1" Series D Legend White Background Black Legend and Border</p>	<p>FTP-26-06 1' x 1' 2" Radii 3/8" Border 1" Series D Legend White Background Black Legend and Border</p>	<p>FTP-29-06 2'-0" x 1'-0" 2" Radii 3/8" Border 4" Series C Legend Yellow Background Black Legend and Border</p>	<p>FTP-30-06 2'-0" x 3'-0" 3" Radii 3/8" Border White Background Black Legend and Border</p>
<p>FTP-30A-06 2' x 3' 3" Radii 3/8" Border Top 4" Series D Legend Bottom 3" Series C Legend White Background Black Legend and Border</p>	<p>FTP-31-06 8' x 4' 6" Radii 3/8" Border Series D Legend Fluorescent Yellow-Green Background Top White Background Bottom Black Legend and Border</p>	<p>FTP-32-06 8' x 4' 6" Radii 3/8" Border 12" Series E and 8" Series D Legend White Background Black Legend and Border</p>	<p>FTP-33-06 2'-4" x 2'-6" 2" Radii 3/8" Border 5" Series C Legend Fluorescent Yellow-Green Background Black Legend and Border</p>
<p>FTP-34-06 2' x 2'-6" 3" Radii 3/8" Border 4" Series D and E Legend White Background Black Legend and Border</p>	<p>FTP-35-06 2' x 3' 3" Radii 3/8" Border Top 4" Series D Legend Bottom 4" and 10" Series E Legend Fluorescent Yellow-Green Background Top White Background Bottom Black Legend and Border</p>	<p>FTP-36-06 2' x 2' 2" Radii 3/8" Border 4" Series D Legend Green Background White Legend and Border</p>	<p>FTP-37-06 9'-6" x 6' 9" Radii 2" Border 8" Series E Legend White Background Black Legend and Border</p> <p>State Line Sign</p>
<p>LAST REVISION 11/01/17</p>	<p>DESCRIPTION:</p>	<p>FY 2018-19 STANDARD PLANS</p>	<p>SPECIAL SIGN DETAILS</p>
			<p>INDEX 700-102</p>
			<p>SHEET 5 of 11</p>

<p>FTP-83-08 10'-0" X 5'-0" 8" Radii</p> <p>10" Series E Legend Green Background White Legend</p>	<p>FTP-84-09 3' X 3' 1.5" Radii</p> <p>5" Series D Legend Yellow Background Black Legend</p>	<p>FTP-85-13 3' X 2'-6" 1.875" Radii 1/2" Border</p> <p>3.5" Series C Legend White Background Black Legend and Border</p>	<p>MOT-1-06 4' X 4' 2" Radii 1/2" Border</p> <p>6" Series C Legend Orange Background Black Legend and Border</p>
<p>MOT-2-06 4' X 4' 2" Radii 1/2" Border</p> <p>Orange Background Black Arrows and Border</p>	<p>MOT-3-06 4' X 4' 2" Radii 1/2" Border</p> <p>Orange Background Black Arrows and Border</p>	<p>MOT-4-06 4' X 4' 2" Radii 1/2" Border</p> <p>6" Series C Legend Orange Background Black Legend and Border</p>	<p>MOT-5-06 4' X 4' 2" Radii 1/2" Border</p> <p>6" Series C Legend Orange Background Black Legend and Border</p>
<p>MOT-6-06 5' X 5' 2" Radii 1/2" Border</p> <p>6" Series D Legend Orange Background Black Legend and Border</p>	<p>MOT-7-06 5' X 5' 2" Radii 1/2" Border</p> <p>6" Series D Legend Orange Background Black Legend and Border</p>	<p>MOT-8-06 5' X 5' 2" Radii 1/2" Border</p> <p>6" Series D Legend Orange Background Black Legend and Border</p>	<p>MOT-9-06 5' X 5' 2" Radii 1/2" Border</p> <p>6" Series D Legend Orange Background Black Legend and Border</p>
<p>LAST REVISION: 11/01/17</p> <p>DESCRIPTION:</p>	<p>FDOT</p> <p>FY 2018-19 STANDARD PLANS</p>	<p>SPECIAL SIGN DETAILS</p>	<p>INDEX: 700-102</p> <p>SHEET: 10 of 11</p>

Sheet 1 of 1

Deleted Index and moved the details into FDM 230.2.10.

SIGN EXAMPLES

TREASURE COAST
SUNSHINE'S GIFT SHOPPE

TOURIST ACTIVITIES

↑ CHATTAHOOCHEE CANDY STORE
5 ← PETTIS FARMS BED & BREAKFAST
← (LOAD HERE) COUNTRY KURBO SHOP
← THOMAS TUBE RENTAL 25 →

NOTES:

1. Signs must comply with Rule 14-51, Florida Administrative Code.
2. Use 6" Type C lettering.
3. See index 700-010 for Single Column Ground Sign for foundation and connection details.
4. See Index 700-020 for Multi-Column Ground Sign for foundation and connection details.
5. See Index 102-600, Work Zone Sign Supports, for Temporary 3-Post Sign Support assembly and foundation details. Galvanize Steel U-Channel in accordance with ASTM 123.

DESIGN FOR TOURIST ORIENTED DIRECTIONAL SIGNS (Options for Aluminum Round Tube, Steel I Beam and Steel U-Channel)						
Total Area (SF)	Single Post Configuration		Two Post Configuration		Three Post Configuration	
	3-1/2" X 0.125" Aluminum Tube Direct Burial	4" X 0.125" Aluminum Tube Slip Base	S3X5.7 Steel I Beam Slip Base	W6X12 Steel I Beam Slip Base	3 lb/ft Steel U-Channel Direct Burial	4 lb/ft Steel U-Channel Lap Splice
6-10	OK	OK	N/A	N/A	N/A	N/A
16-20	N/A	OK	N/A	N/A	N/A	N/A
14-16	N/A	N/A	OK	OK	OK	OK
22-24	N/A	N/A	OK	OK	N/A	OK *
30-32	N/A	N/A	N/A	OK	N/A	N/A
38	N/A	N/A	N/A	OK	N/A	N/A

* Limited to 22 SF Total Sign Area.

TEMPORARY 3 POST SIGN SUPPORT

R11/16/2017 2:46:08 PM

LAST REVISION	DESCRIPTION
11/01/17	

FDOT	FY 2018-19 STANDARD PLANS
------	------------------------------

TOURIST ORIENTED DIRECTIONAL SIGNS

INDEX	SHEET
700-103	1 of 1

Sheet 1 of 1

In addition to the highlighted changes to right, revised some sign locations.

~~CASE I Type I Object Markers shall consist of nine yellow reflectors mounted on a yellow reflective background or consist of a retroreflective panel of the same size.~~

~~CASE II End of Road Markers shall consist of the rod reflectors mounted on a red reflective background or consist of a retroreflective panel of the same size.~~

NOTES:

- This index applicable to residential and minor streets only. Major streets to be evaluated on a case by case basis.
- ~~Two-way and one-way arrow reflectors are optional and shall be used on a review each location.~~
- For additional details on aluminum round post, sign panel material and bolts, nuts and washers see Index 700-010.
- Case I Installation - The arrow panels and object markers shall be located approximately 20' but not less than 12' from the edge of the travel lane.
- Dead end sign shall be posted a sufficient advance distance to permit the vehicle operator to avoid the dead end by turning off, if possible, at the nearest intersecting street.
- For pavement marking see Index 711-001.
- ~~Use of yellow is required unless otherwise noted. Use of red requires its use.~~

Revised Wind Beam Details

~~Object markers shall be installed on 2 1/2 x 3/8 Aluminum Round Post, 1/2 x 3/8 Aluminum Hex Head Bolt with Nut and Lockwasher or 1/2 x 3/8 Stainless Steel Hex Head Bolt with Flat Washer, 1/2 x 3/8 Hex Head Lockwasher, 1/2 x 3/8 Washer, 1/2 x 3/8 Hex Head Lockwasher, 1/2 x 3/8 Washer. Post foundation shall be installed in accordance with Index 700-010.~~

LAST REVISION	DESCRIPTION:	FDOT	FY 2018-19	STANDARD PLANS	TRAFFIC CONTROLS FOR STREET TERMINATIONS	INDEX	SHEET
11/01/17						700-109	1 of 1

Sheet 1 of 1

There are Index-wide changes. The primary revisions are the following:

- **Changed title to “Enhanced Highway Signing Assemblies”**
- **The removal of RRFBs to separate Index 654-001**
- **An alpha-numerical system for easy identification**
- **The addition of highlighted signs**
- **The use of pedestals for all roadside signs**

POWER CONFIGURATION 'A' CONVENTIONALLY-POWERED (Type A1 Shown)

POWER CONFIGURATION 'B' SOLAR-POWERED (Type B1 Shown)

GENERAL NOTES:

1. Install sign assemblies based on Alpha-Numerical Type designation shown in the Plans (e.g., Type A1). Assembly Type is based on Power Configuration 'Alpha' Identification shown above and Numerical Identification shown on Sheet 3 thru 8.
2. Install sign panel and wind beam in accordance with Index 700-010 and Specification 700.
3. Engage all threads on the transformer base and post unless the aluminum post is fully seated into base.
4. Meet the requirements of Specification 646 for aluminum poles and transformer bases.
5. Install a concrete slab around all flashing beacon assemblies on slopes 6:1 or greater. The minimum slab dimension is 4'-0" by 5'-0".
6. When wire entry holes are drilled in the sign column, use a bushing or rubber grammet to protect conductors.

POWER CONFIGURATION 'B' NOTES:

1. Install a separate pole for mounting the solar panel, controller and batteries for all flashing beacon assemblies with solar panels, controllers and batteries weighing more than 170 lbs.
2. Install the auxiliary pole as close to the right of way boundary as possible.
3. Install the auxiliary pole so that the height is the same as the column for the beacon assembly.
4. Orient solar panel to face South for optimal exposure to sunlight.
5. The controller and the solar batteries may be located in the same compartment.

TABLE OF CONTENTS:	
Sheet	Description
1	General Notes and Contents
2	Conduit, Wiring, and Foundation Details
3	Roadside Sign Assembly-1
4	Roadside Sign Assembly-2
5	Roadside Sign Assembly-3
6	Roadside Sign Assembly-4
7	Roadside Sign Assembly-5
8	Roadside Sign Assembly-6
9	Overhead Sign Assembly

LAST REVISION 11/01/18

DESCRIPTION:

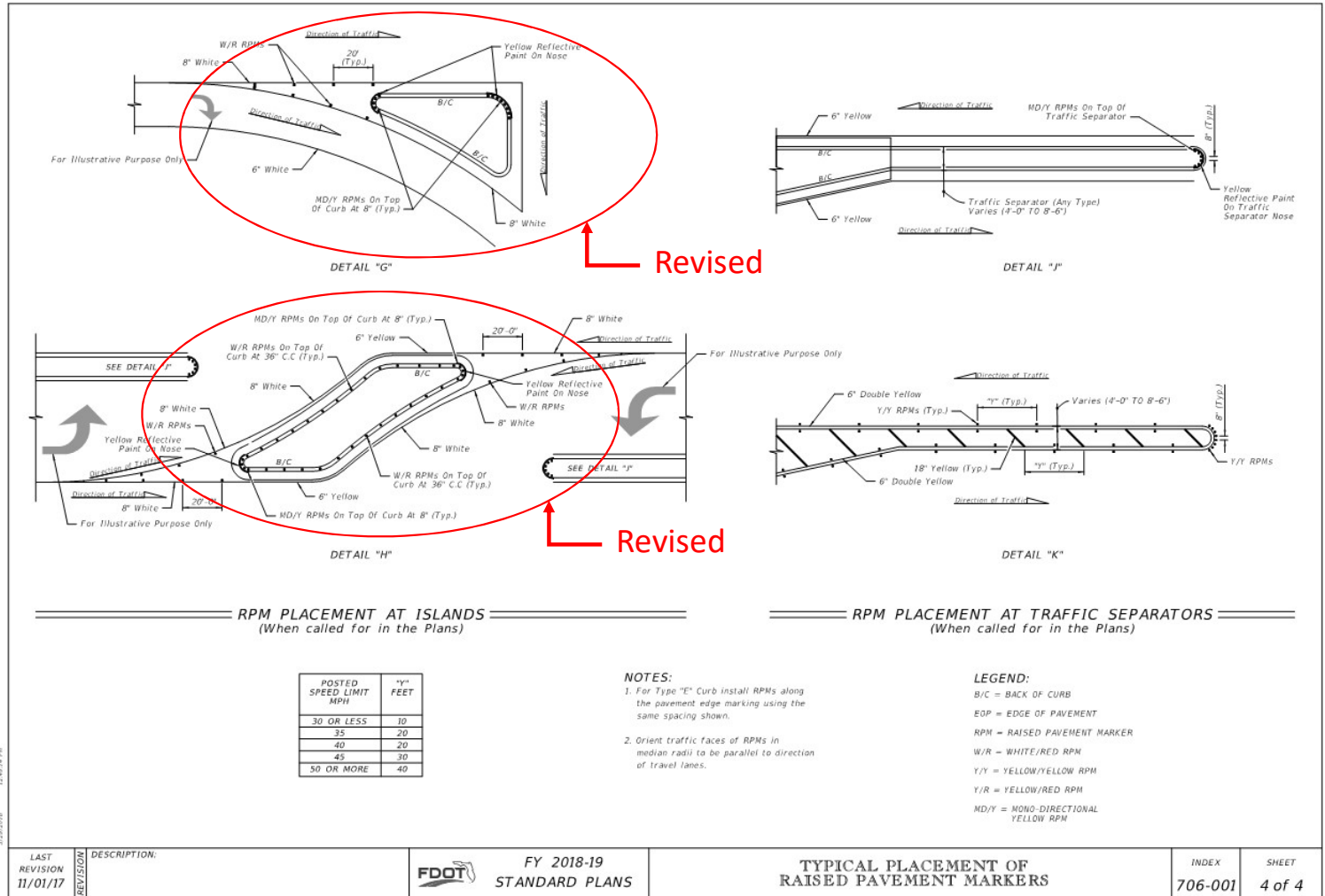
FDOT FY 2019-20 STANDARD PLANS

ENHANCED HIGHWAY SIGNING ASSEMBLIES

INDEX 700-120 SHEET 1 of 9

Sheet 4 of 6

Revised RPM and Reflective Yellow Paint placement.

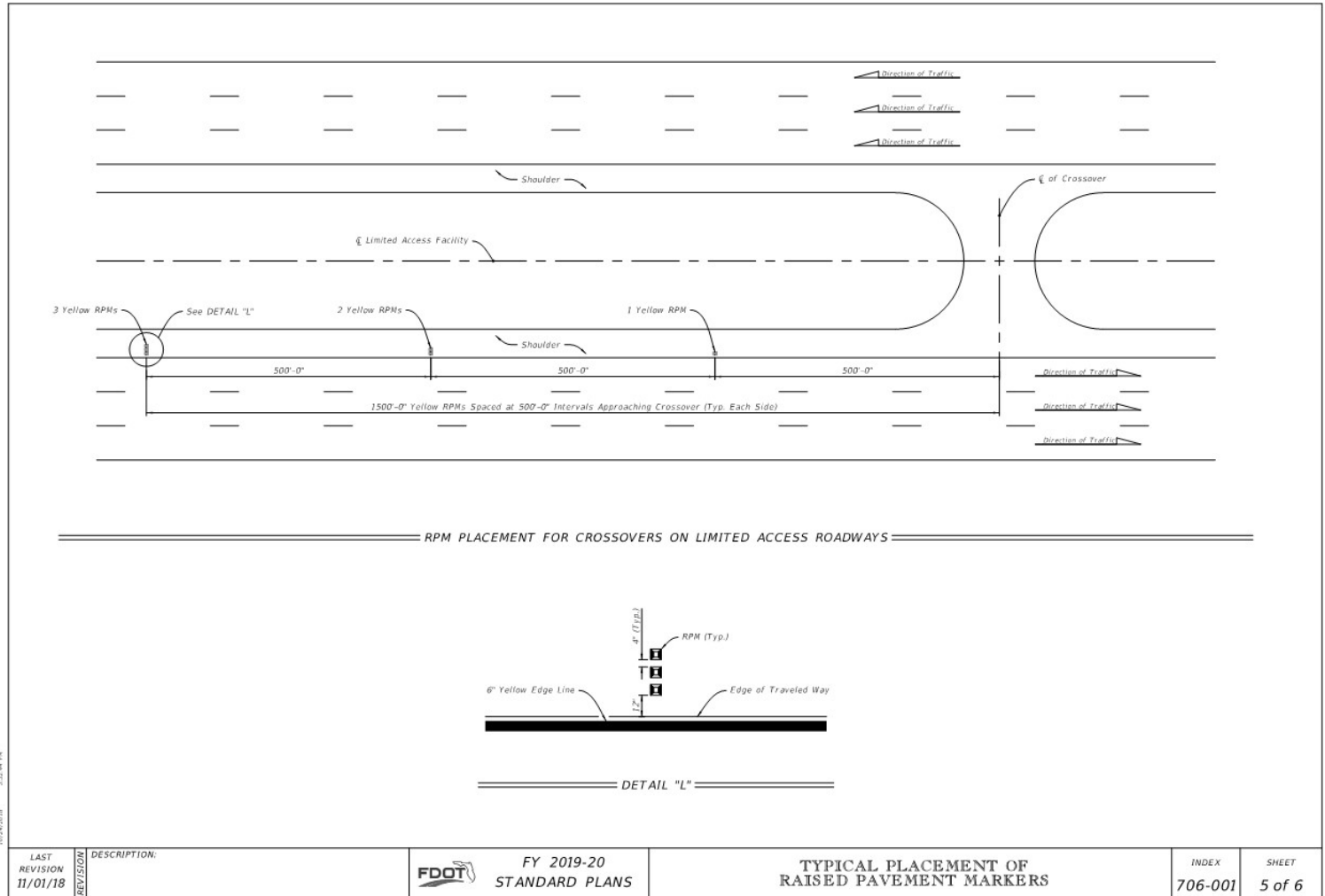


LAST REVISION	DESCRIPTION:
11/01/17	

REVISION

New!

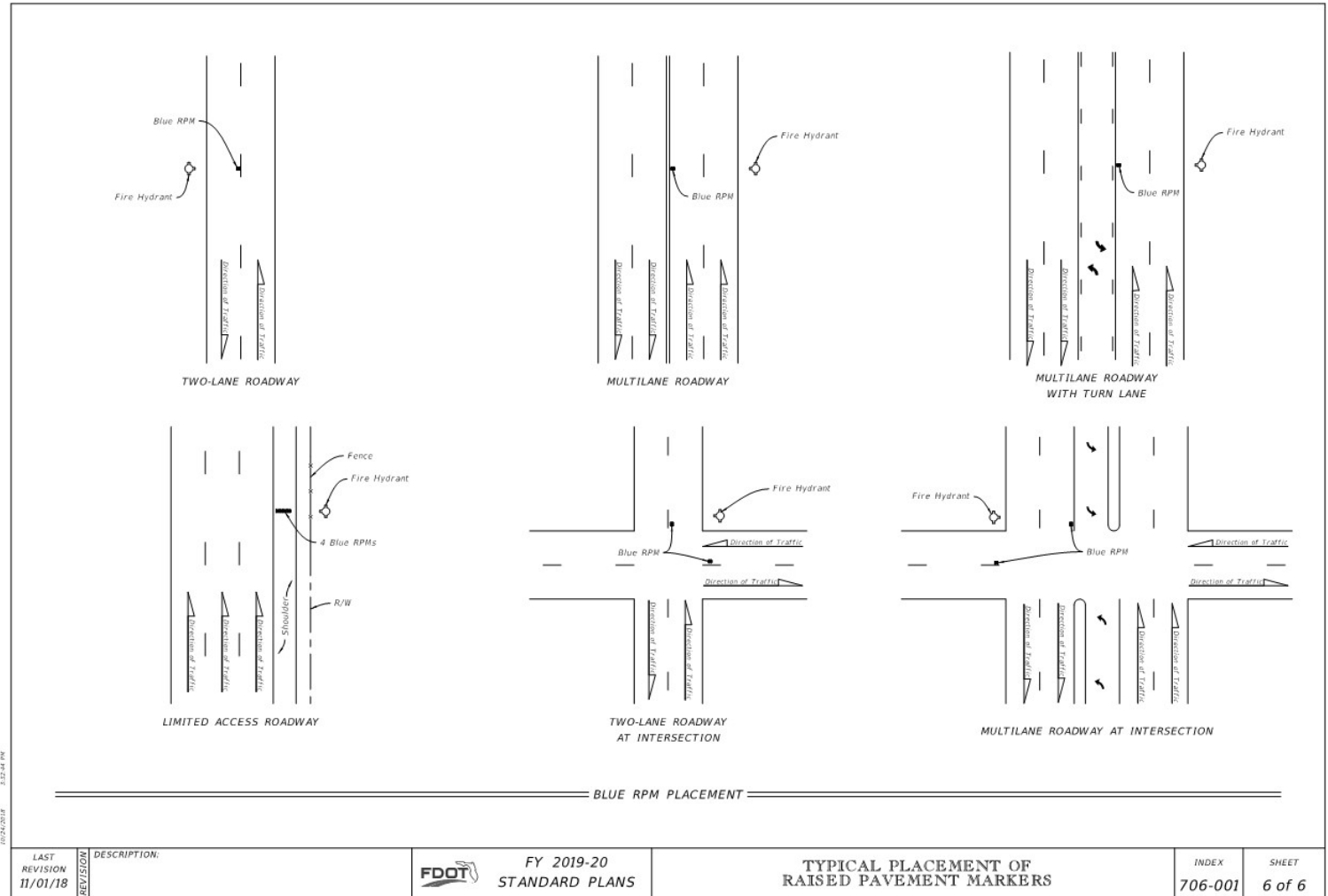
Added sheet showing the placement of RPMs at Limited Access crossovers. This information was previously in FDM 211.3.2.



Sheet 6 of 6

New!

Added sheet showing the placement of blue RPMs. This information is currently in TEM Section 4.3.



8/24/2018 3:27:34 PM

LAST REVISION 11/01/18	REVISION	DESCRIPTION:	FY 2019-20 STANDARD PLANS	TYPICAL PLACEMENT OF RAISED PAVEMENT MARKERS	INDEX 706-001	SHEET 6 of 6
---------------------------	----------	--------------	------------------------------	---	------------------	-----------------

Sheet 1 of 13

Significant changes on Sheet 1 are the following:

- Added standard details for route shields
- Added pavement message spacing table

34 S.F.

23 S.F.

20 S.F.

26 S.F.

13 S.F.

20 S.F.

22 S.F.

20 S.F.

43 S.F.

Route Shield for Limited Access Roadways (Interstate)
Route Shield Shown: U.S. and State Route Shield Similar
128 S.F.

Route Shield for Arterials and Collectors (Interstate)
Route Shield Shown: U.S. and State Route Shield Similar
72 S.F.

Wrong-Way Arrow
24 S.F.

Turn and Through Lane-Use Arrow
29 S.F.

U Turn Lane-Use Arrow
27 S.F.

Through Lane-Use Arrow
12 S.F.

Turn Lane-Use Arrow (Left Turn Shown - Right Turn Similar)
17 S.F.

Roundabout Approach Arrow
19 S.F.

Preferential Lane Symbol
11 S.F.

NOTES FOR PAVEMENT MESSAGES:

- When an arrow and a pavement message are used together, locate the arrow a distance of "5" downstream from the pavement message. Measure the distance from the base of the arrow to the base of the pavement message. See the Pavement Message Spacing Table for "S" value.
- Place all pavement messages 25' back from the stop line.
- Dimensions are within 1" ±.
- All grids are 4' x 4'.
- All pavement messages must be white except route shields.
- Increase width of route shield for routes with three digits.

PAVEMENT MESSAGE AND ARROW DETAILS

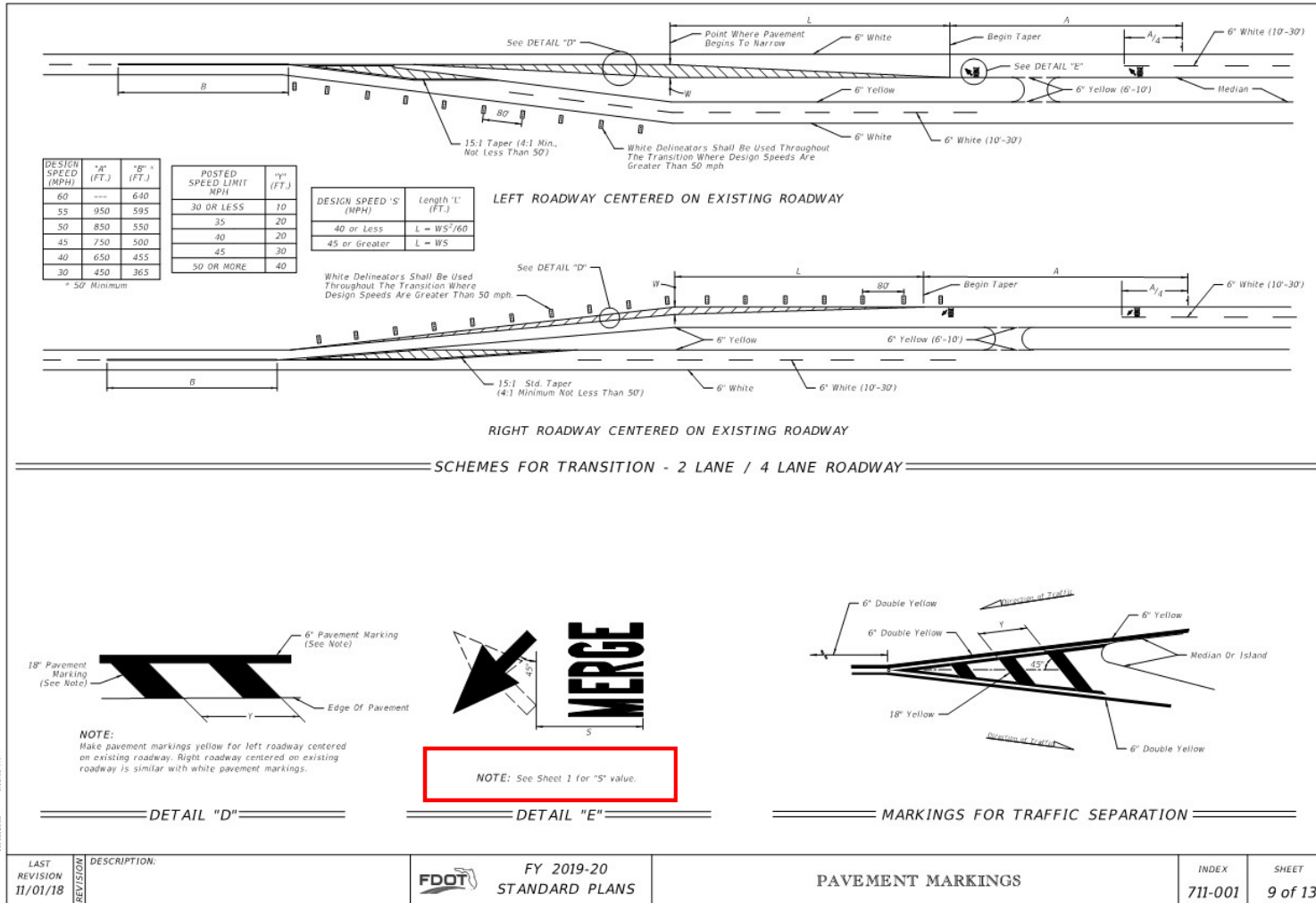
GENERAL NOTE:

- See Index 509-070 for pavement markings at railroad crossings.

PAVEMENT MESSAGE SPACING TABLE	
Posted Speed (mph)	Distance "S" (feet)
≤ 25	40
30 - 35	56
40 - 45	72
≥ 50	88

01/18/2018 11:23:09 AM

<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left;">LAST REVISION</th> <th style="text-align: left;">DESCRIPTION:</th> </tr> <tr> <td>11/01/18</td> <td></td> </tr> </table>	LAST REVISION	DESCRIPTION:	11/01/18		<p>FY 2019-20 STANDARD PLANS</p>	<p>PAVEMENT MARKINGS</p>	<p>INDEX 711-001</p>	<p>SHEET 1 of 13</p>
LAST REVISION	DESCRIPTION:							
11/01/18								

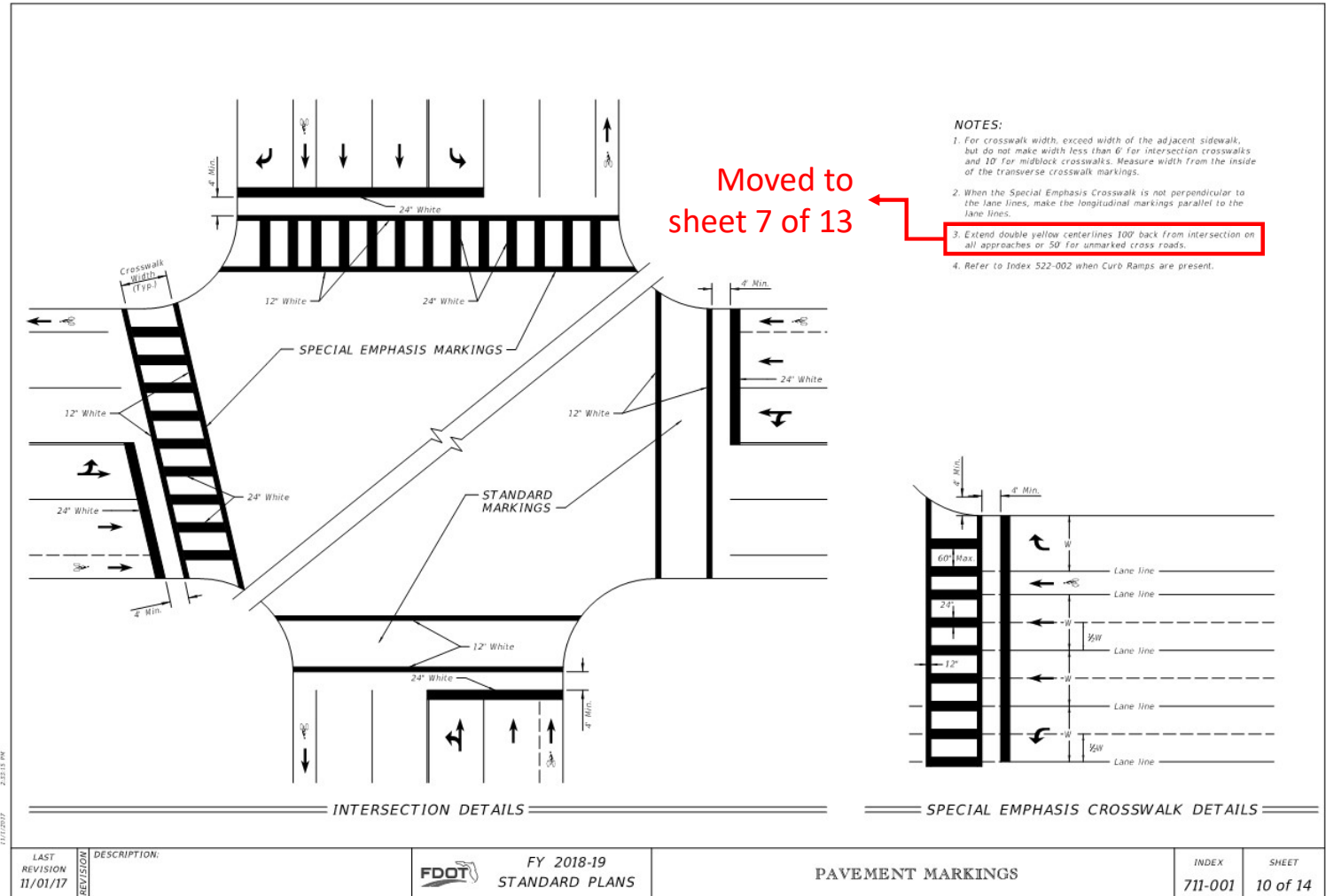


DATE PLOTTED: 11/01/18

<table border="1"> <thead> <tr> <th>LAST REVISION</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td>11/01/18</td> <td></td> </tr> </tbody> </table>	LAST REVISION	DESCRIPTION	11/01/18		<table border="1"> <tr> <td> </td> <td> FY 2019-20 STANDARD PLANS </td> </tr> </table>		FY 2019-20 STANDARD PLANS	<table border="1"> <tr> <td> PAVEMENT MARKINGS </td> <td> <table border="1"> <tr> <th>INDEX</th> <th>SHEET</th> </tr> <tr> <td>711-001</td> <td>9 of 13</td> </tr> </table> </td> </tr> </table>	PAVEMENT MARKINGS	<table border="1"> <tr> <th>INDEX</th> <th>SHEET</th> </tr> <tr> <td>711-001</td> <td>9 of 13</td> </tr> </table>	INDEX	SHEET	711-001	9 of 13
LAST REVISION	DESCRIPTION													
11/01/18														
	FY 2019-20 STANDARD PLANS													
PAVEMENT MARKINGS	<table border="1"> <tr> <th>INDEX</th> <th>SHEET</th> </tr> <tr> <td>711-001</td> <td>9 of 13</td> </tr> </table>	INDEX	SHEET	711-001	9 of 13									
INDEX	SHEET													
711-001	9 of 13													

Sheet 10 of 13

Revised sheet to show only basic crosswalk pavement marking details.



11/1/2017 2:35:15 PM

LAST REVISION 11/01/17	REVISION	DESCRIPTION:		FY 2018-19 STANDARD PLANS	PAVEMENT MARKINGS	INDEX 711-001	SHEET 10 of 14
---------------------------	----------	--------------	--	------------------------------	-------------------	------------------	-------------------

SINGLE LEFT TURNS

** Queue Length L_q Is Measured From The Median Nose Radial Point Or, When A Stop Bar Is Required, From The Stop Bar.

DOUBLE LEFT TURNS

Through Lane Becomes Exclusive Left Turn

Through Lane Becomes Optional Left Turn

TURN LANE MARKINGS

Design Speed (mph)	TURN LANES - CURBED AND UNCURBED MEDIANS					
	URBAN CONDITIONS			RURAL CONDITIONS		
	Clearance Distance	Brake To Stop Distance	Total Decel. Distance	Clearance Distance	Brake To Stop Distance	Clearance Distance
35	70'	75'	145'	110'	---	---
40	80'	75'	155'	120'	---	---
45	85'	100'	185'	135'	---	---
50	105'	135'	240'	160'	185'	160'
55	125'	---	---	---	225'	195'
60	145'	---	---	---	260'	230'
65	170'	---	---	---	290'	270'

ARROW SPACING

1 Arrow: Less Than 100'

2 Arrows: Varies 100' To 150'

3 Arrows: Varies 150' To 200'

Arrow should be evenly spaced between first and last arrow. Turn lanes longer than 200' add one arrow for each 100' additional length.

NOTES:

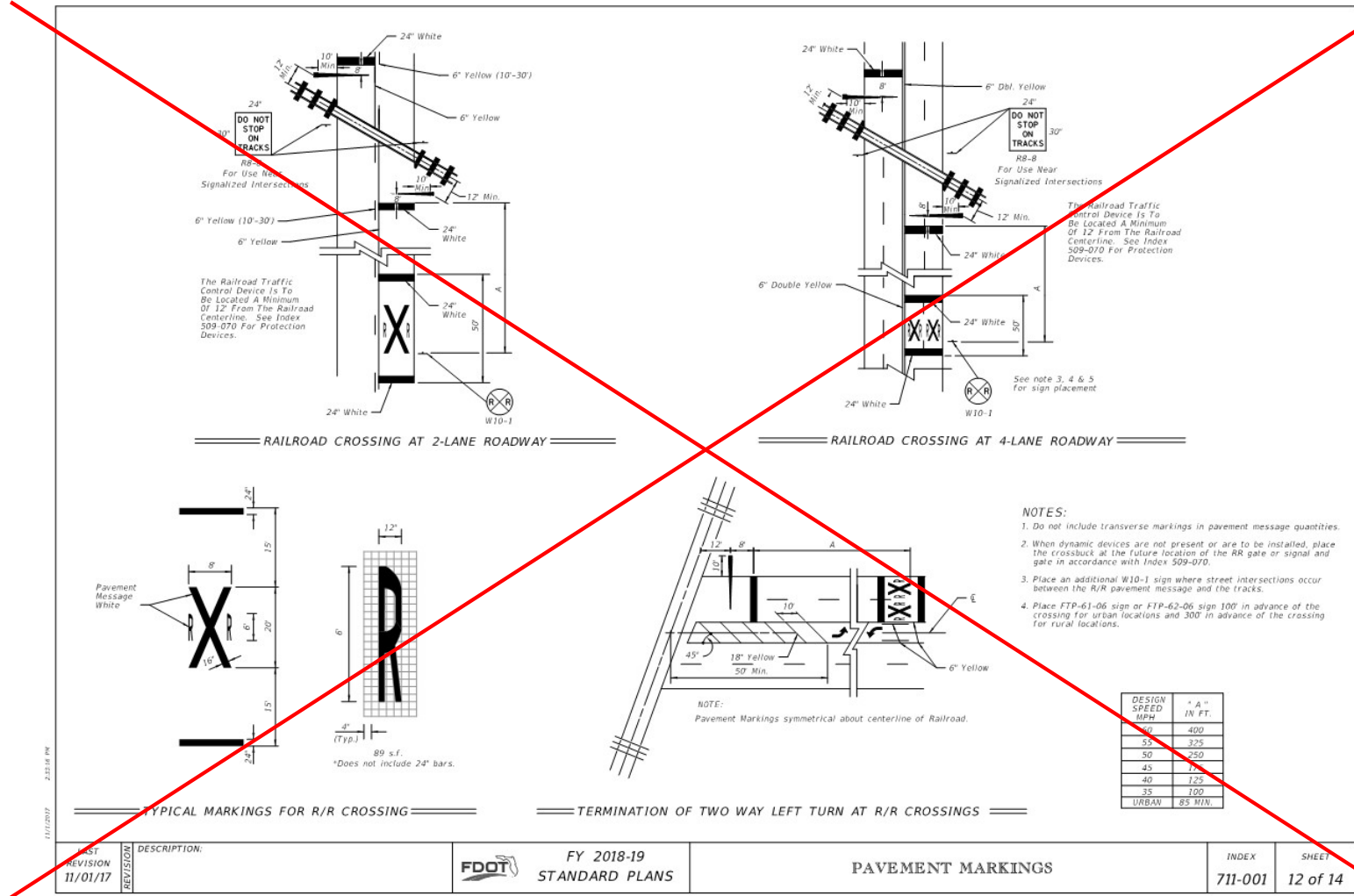
- This Index also applies to right turn lanes.
- Make pavement marking yellow for left-turn lanes and white for right-turn lanes.
- See Sheet 1 for "S" value.

REVISED 11/01/18

LAST REVISION 11/01/18	REVISION	DESCRIPTION:	FY 2019-20 STANDARD PLANS	PAVEMENT MARKINGS	INDEX 711-001	SHEET 11 of 13
---------------------------	----------	--------------	------------------------------	-------------------	------------------	-------------------

Old Sheet 12 of 14

This sheet has been deleted.
See Index 509-070 for
pavement markings at at-
grade railroad crossings.



11/1/2017 2:35:16 PM

<table border="1"> <tr> <th>REVISION</th> <th>DESCRIPTION</th> </tr> <tr> <td>11/01/17</td> <td></td> </tr> </table>	REVISION	DESCRIPTION	11/01/17		<table border="1"> <tr> <td> </td> <td> FY 2018-19 STANDARD PLANS </td> <td> PAVEMENT MARKINGS </td> <td> INDEX 711-001 </td> <td> SHEET 12 of 14 </td> </tr> </table>		FY 2018-19 STANDARD PLANS	PAVEMENT MARKINGS	INDEX 711-001	SHEET 12 of 14
REVISION	DESCRIPTION									
11/01/17										
	FY 2018-19 STANDARD PLANS	PAVEMENT MARKINGS	INDEX 711-001	SHEET 12 of 14						

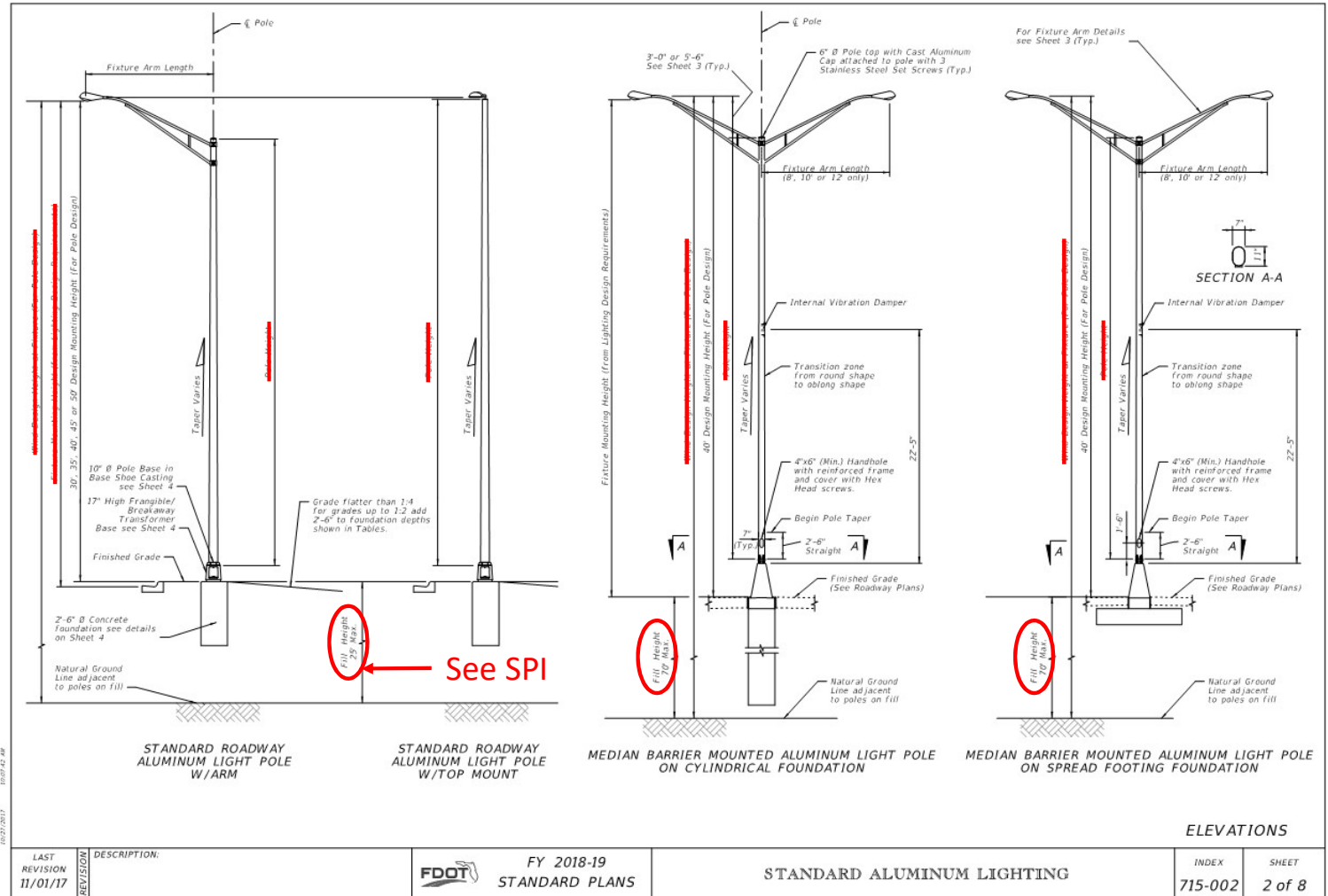
Standard Plans – Primary Updates

- ✓ 1) *Temporary Traffic Control Indexes*
- ➔ ✓ 2) *Signal, Signing & Pavement Marking Indexes*
- 3) *Lighting Indexes*
 - a) *Index 715-002 – Standard Aluminum Lighting*

Sheet 2 of 8

There are many revisions to this Index, but the changes are mostly formatting and for clarity.

Note: The values of tables that have changed or disappeared have been reworked, when possible, into the details to which the tables applied (see sheets 3-5 of 8).



Sheet 4 of 8

Pole wall thicknesses have been revised!

SECTION C-C
Pole & Arm
1-0" Lap
Tie Bars
8 - #7 Bars Equally Spaced
3" Cover (Typ.)

VIEW B-B
Pole & Arm
45° Typ.
2'-6" Ø
Typical Embedment - 36"
1'-3" Ø Bolt Circle
4 - Equally Spaced Anchor Bolts Oriented as Shown when the Shaft is Installed.

FOUNDATION
Foundation Depth (See Foundation Note 1)
7'-0" (Pole P1 and P3)
8'-0" (Pole P2)
1" Chamfer
Conduit with Elbow 1" Min. (Typ.)
Double Nuts (Typ.)
Tie Bars (See Foundation Note 2)
#6 AWG Bare Ground Wire Cast in Concrete or Placed in Conduit
8-#7 Bars Equally Spaced
Class I Concrete may be Cast-in-Place or Precast With "Flowable Fill" Backfill
Minimum Embedment 3'-6"

FOUNDATION NOTES:
1. Depths shown are for slopes flatter than 1:4, for slopes 1:2 or flatter, add 2'-6" to foundation depths shown.
2. Foundation Tie Bars: #4 Tie Bars @ 12" centers (max.) or D10 (or W10) spiral @ 6" pitch, 3 flat turns top and 1 flat turn bottom.

TOP MOUNT TENON
2 3/8" Ø
1/4" H

TOP VIEW TRANSFORMER BASE
Slots for Cast Aluminum Base Shoe 13 1/2" Bolt Circle

BOTTOM VIEW TRANSFORMER BASE
Slots for 15" Bolt Circle

POLE BASE ELEVATION
Fillet Weld Outside of Pole to Top of Base Shoe (See Pole Table)
10" Pole Base O.D.
Pole Wall Thickness (See Pole Table)
Cast Aluminum Pressure Mounted Nut Cover - Bolted Attachment Optional
3/16" Min.
Cast Aluminum Base Shoe (See General Notes on Sheet 1)
Shoe Base Bolt with Nut and Washer
Fillet Weld Butt of Pole to Inside of Base Shoe (See Pole Table)
1'-5"
Cast Aluminum Frangible/Breakaway Transformer Base. See General Notes on Sheet 1.
Anchor Bolt and Washer as Required by Approved Breakaway Transformer Base Manufacture (Typ.)
DANGER HIGH VOLTAGE DO NOT TOUCH

ARM-POLE TABLE					
FOR STANDARD ALUMINUM LIGHT POLES WITH ARM					
Assembly Height (ft)	Wind Speed and Arm Lengths (ft)				
	120 mph	140 mph	160 mph		
30	8, 10, 12, 15	8, 10, 12	15	8, 10	12, 15
35	A1-P1	A1-P1	A2-P1	A1-P1	A2-P1
40				A1-P2	A2-P2
45	A1-P2	A1-P2	A2-P2	A1-P2	A2-P2
50				A1-P3	A2-P3

ARM POLE NOTES:
1. See ARM SECTION detail on Sheet 3 for all A1 and A2 Values.
2. See Pole Table for all P1, P2, and P3 values.
3. For Median Barrier Mounted Pole, Use Arm A1.

POLE TABLE			
Pole	Pole Wall Thickness	Top of Base Shoe Weld	Inside of Base Shoe Weld
P1	0.156	3/8"	3/8"
P2	0.250	1/2"	1/2"
P3	0.313	5/8"	5/8"

POLE NOTES:
1. Pole wall thicknesses shown are nominal and must be within the Aluminum Association tolerances.
2. Thicker walls are permitted and tapered walls may be used in accordance with the minimum Aluminum Association thicknesses.

TOP MOUNT POLE TABLE			
FOR STANDARD ALUMINUM LIGHT POLES WITH TOP MOUNT			
Assembly Height (ft)	Wind Speed and Arm Lengths (ft)		
	120 mph	140 mph	160 mph
30			Pole P1
35	Pole P1	Pole P1	Pole P1
40			Pole P2
45	Pole P2	Pole P2	Pole P2
50			Pole P2

POLE AND BASE DETAILS FOR ROADWAY ALUMINUM LIGHT POLE

LAST REVISION 04/03/18	DESCRIPTION: FY 2019-20 STANDARD PLANS	STANDARD ALUMINUM LIGHTING	INDEX 715-002	SHEET 4 of 8
----------------------------------	---	-----------------------------------	-------------------------	------------------------

Questions?



Ed Cashman, P.E.
Standard Plans Engineer
State Roadway Design Office
(850) 414-4314
edward.cashman@dot.state.fl.us

A graphic of an open book with a white cover and a dark spine. The pages are white and the text is centered on the right page. On the right edge of the book, there are four colorful tabs: teal, purple, yellow, and red.

*FY 2019-20 Standard Plans
Update Training*

Structures Design Office Updates

(December, 2018)

Cheryl Hudson, P.E.

Structures Design Standards Group

Cheryl.hudson@dot.state.fl.us

(850) 414-5332

- General Review
- Standard Plans Packager
- Editorial Changes
- Minor *Standard Plans* Revisions
- Major *Standard Plans* Revisions
- *SPI* Revisions
- *Cell* Revisions (Data Tables)
- *Developmental Design Standards/Standard Plans*
- Looking Ahead



[This Photo](#) by Unnown Author is licensed under [CC BY-SA-NC](#)



Standard Plan Index Numbers are consecutive within each Section (Roadway, Bridge).

Standard Plans in the Bridge section must be included in the Structures Plan Set if utilized.

Walls: all walls are in the Roadway section

Box Culverts: all are located in the Bridge section



[This Photo](#) by Unknown Author is licensed under [CC BY-SA](#)

<http://www.fdot.gov/design/standardplans/Current/default.shtm>

Revision Logs: A table of revisions is created for each release and changes are combined (Roadway & Bridge) and are listed in numerical order and is available at the same location as the Standard Plans: <http://www.fdot.gov/design/standardplans/Current/default.shtm>

Standard Plans - FY 2019-20



See the **FDOT Design Manual (FDM), Chapter 115**, for additional information on the use of **Standard Plans** within FDOT Contract Plans.

Skip to **Standard Plans for Bridge Construction**

(Last updated: **11/02/2018**)


Standard Plans for Road Construction

Standard Plans Index	Interim Revision or Errata	Index Title	Design Standards Index	Standard Plans Instructions	Design Tools	Contact
Support Detail						
eBook		Standard Plans for Road Construction - Complete eBook				Roadway
Cover		Cover Sheet				
Abbrev		Abbreviations Sheet				
TOC Road		Table of Contents - Road Construction				
Crosswalk		Crosswalk of Design Standards Index to Standard Plans				
Revisions		Revision History Log		SPI		



Numerically: no separation for roadway/structures.

STANDARD PLANS
FY 2019-20 REVISIONS LOG



Standard Plans Index	Description
521-010	<p>Redeveloped Standard</p> <p>New Sheet 1: Updated designs for all variations of single-slope and existing F-Shape barriers; Updated spacing of vertical and horizontal reinforcing steel, Added a minimum transverse joint spacing; Added leave-out concept for measurement; Added accommodation for welded wire reinforcing and variable barrier heights.</p> <p>New Sheet 2: Added detail for terminating at 56" height barrier sections; Added detail for continuing over 44" height barrier sections.</p>
521-422	<p>Sheet 1: Changed Barrier Delineator Note.</p> <p>Sheet 2: Editorial, sidewalk hook bars.</p>
521-423	<p>Sheet 1: Changed Barrier Delineator Note.</p> <p>Sheet 2: Editorial, "RAILING END DETAIL" and "VIEW A-A AND B-B".</p>
521-426	<p>Sheet 1: Changed Barrier Delineator Note.</p>
521-427	<p>Sheet 1: Changed Barrier Delineator Note.</p>
521-428	<p>Sheet 1: Changed Barrier Delineator Note.</p> <p>Sheet 2: Editorial</p>
521-509	<p>All: Reorganized sheets and renumbered; Updated sheet # references.</p> <p>Sheet 1: Added notes moved from other sheets; Added Note 6.</p> <p>Sheet 2: Changed reinforcing.</p> <p>Sheet 3: Changed reinforcing.</p> <p>Sheet 4: Changed reinforcing.</p> <p>Sheet 5: Changed Note references to new reinforcing bars.</p>
521-510	<p>All: Reorganized sheets and renumbered; Updated sheet # references.</p> <p>Sheet 1: Added notes moved from other sheets; Added Note 6.</p> <p>Sheet 2: Changed reinforcing.</p> <p>Sheet 3: Changed reinforcing.</p> <p>Sheet 4: Changed reinforcing.</p> <p>Sheet 5: Changed Note references to new reinforcing bars.</p>
521-511	<p>Sheet 1: Updated Notes.</p> <p>Sheet 2: Added Bar 5R3; Changed reinforcing.</p> <p>Sheet 3: Added Bar 5R3; Changed reinforcing.</p>
521-512	<p>Sheet 1: Updated Notes.</p> <p>Sheet 2: Added Note 6; changed asphalt description in SECTION B-B.</p>



Standards Plans Packager Program (Tool):

For compiling Structures Standard Plans (Indexes) for the Structures Component Plans

<http://www.fdot.gov/structures/CADD/standards/CurrentStandards/MicrostationDrawings.shtm>



Florida Department of
TRANSPORTATION

E-Updates | FL511 | Mobile | Site Map

Search FDOT...

Home About FDOT Contact Us Maps & Data Offices Performance Projects

Structures Design

Structures Design

Structures Design Standards Details & Data Tables



PLEASE READ THE FOLLOWING BEFORE DOWNLOADING MICROSTATION DRAWINGS

The official Design Standards are available at the Roadway Office website:

Design Standards webpage

Design Standards depict common structural components or elements suitable for standardization. Their use is by reference in the Contract Plans to the official Design Standards as specified in the Plans Preparation Manual (Volume II, Section 3.8). Some "Structures" Design Standards require the designer to complete a Data Table(s) and include in the Contract Plans. These Data Tables should be available on the FDOT Structures bar menu within the TTF_V8semi-standards.cel cell library. If a Data Table is not included in the FDOT Structures bar menu, the latest cell library can be downloaded from the link provided below or individual cells can be downloaded from the **Standard Plans webpage** for FY2012/2013 and later.

1.) Structures Related Design Standards Details:

(see **Standard Plans website** for FY 2012/2013 and later Design Standards Details & Revisions)

(see **Archived Drawings** for 2010/2011 and earlier Design Standards Details & Interims)

Structures Standard Plans Packager Program (used to bundle Bridge Standard Plans into a PDF file for Structures Component)

Standards Plans Packager Tool:

Added a selection tool to choose the let date which selects the correct Standard Plans Book

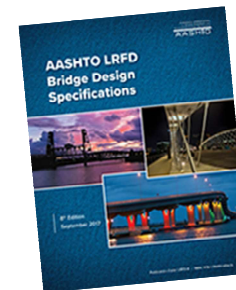
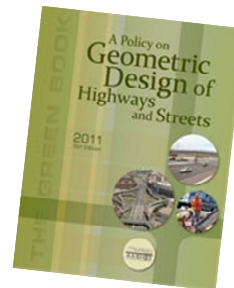


Continuing our work towards consistency - Indexes, Instructions, and Specifications.

Editorial: Insignificant changes such as spelling and grammar correction, font style and size. Revision date is not changed.

Railings vs. Barriers: (Editorial) Made changes to correct some references, in regard to the joint effort in cooperation with Roadway and Specifications - the following rule of thumb:

If located on a Bridge or Approach Slab = *Traffic Railing*
If located on a wall or shoulder = *Concrete Barrier*



- **Index 102-200: Detour Bridge**
 - Changed Storage Facility phone number
- **Index 450 Series: 450-036 thru 450-096 Florida-I Beams**
 - Corrected Note # references in END VIEW
- **450-010 & 450-120: I Beam Notes**
 - Added Note 13 (holes in web)+
- **455-400: Precast Concrete Sheet Pile Walls**
 - Changed Table: Added Initial Jacking Force and moved Section Modulus and Prestress after Losses to SPI
- **455-440: Precast Concrete Sheet Pile Walls (corrosion resistant)**
 - Changed Table: Added Initial Jacking Force and moved Section Modulus and Prestress after Losses to SPI
 - Changed Dimension A for S4 thru S7 Bars

STORAGE FACILITY:
 Contact
 FDOT Statewide Aluminum Shop
 2590 Camp Rd.
 Oviedo, FL
 407-278-2727
 For shipping weights and dimensions of Temporary Bridge elements.

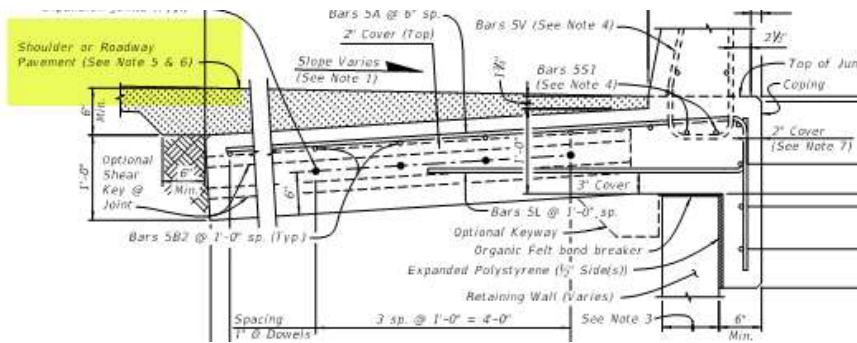
13. Holes in the beam web for temporary bracing or shipping devices must be formed prior to casting. Fill holes not meeting all the following criteria in accordance with Specification Section 450.
 A. The superstructure environmental classification is slightly or moderately aggressive
 B. Clear cover to adjacent steel reinforcing is 1" or greater
 C. Hole inside diameter is 2" maximum
 D. Non-metallic, non-water absorbing forming materials such as PVC, may be left in place permanently.

Strand Material	Wall Thickness	STRAND DIA. (in.)	MAXIMUM L *	n	D (in.)	TOTAL # OF STRANDS	Initial (Jacking) FORCE (Kip)
CFRP Strand	T=10 in.	0.49 (12.5mm)	26'-0"	4	4	10	28.7
		0.5 (12.7mm)	27'-0"	3	5 $\frac{1}{4}$ ⁽²⁾	8	41.3
		0.6 (15.2mm)	27'-0"	3	5 $\frac{1}{4}$ ⁽²⁾	8	42.7
	T=12 in.	0.49 (12.5mm)	31'-0"	5	3 $\frac{1}{4}$ ⁽¹⁾	12	28.7
		0.5 (12.7mm)	31'-0"	3	5 $\frac{1}{4}$ ⁽²⁾	8	41.3
		0.6 (15.2mm)	31'-0"	3	5 $\frac{1}{4}$ ⁽²⁾	8	42.7
HSSS Strand	T=10 in.	0.5 (12.7mm)	27'-0"	5	3 $\frac{1}{4}$ ⁽¹⁾	12	25.7
		0.6 (15.2mm)	26'-0"	3	5 $\frac{1}{4}$ ⁽²⁾	8	36.5
	T=12 in.	0.5 (12.7mm)	32'-0"	6	2 $\frac{3}{4}$ ⁽³⁾	14	25.7
		0.6 (15.2mm)	32'-0"	4	4	10	36.5

Concrete Sheet Pile Table was Changed



- **521-512: Concrete Barrier/Noise Wall**
 - Reorganized Notes (*read notes carefully – some have changed*)
 - Sheet 2: Added Note 6 (*Clarification on asphalt type*)



- 5. For Rigid Pavement (Concrete), Junction Slab may be thickened to match finished grade.
- 6. For Asphalt: Shoulder or Roadway Pavement will be SuperPave Structural asphalt. Variable thickness asphalt will be structural overbuild.

- **Index 521-610: Concrete Barrier/Junction Slab**
 - Same change as 521-512 to clarify asphalt.

- **Index 515-052 & 515-062: Pedestrian/Bicycle Railings**
 - *Corrected specification reference.*

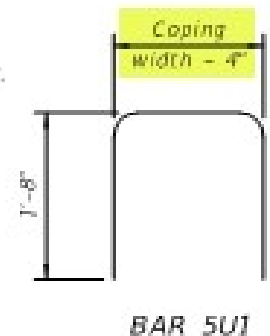
- **Index 521-400 & 500 Series: Traffic Railings**
 - *Added color information back into the Barrier Delineator note*

BARRIER DELINEATORS: Install Barrier Delineators on top of the Traffic Railing 2" from the face on the traffic side in accordance with Specification Section 705. Match the Barrier Delineator to the color (white or yellow) of the near edgeline.

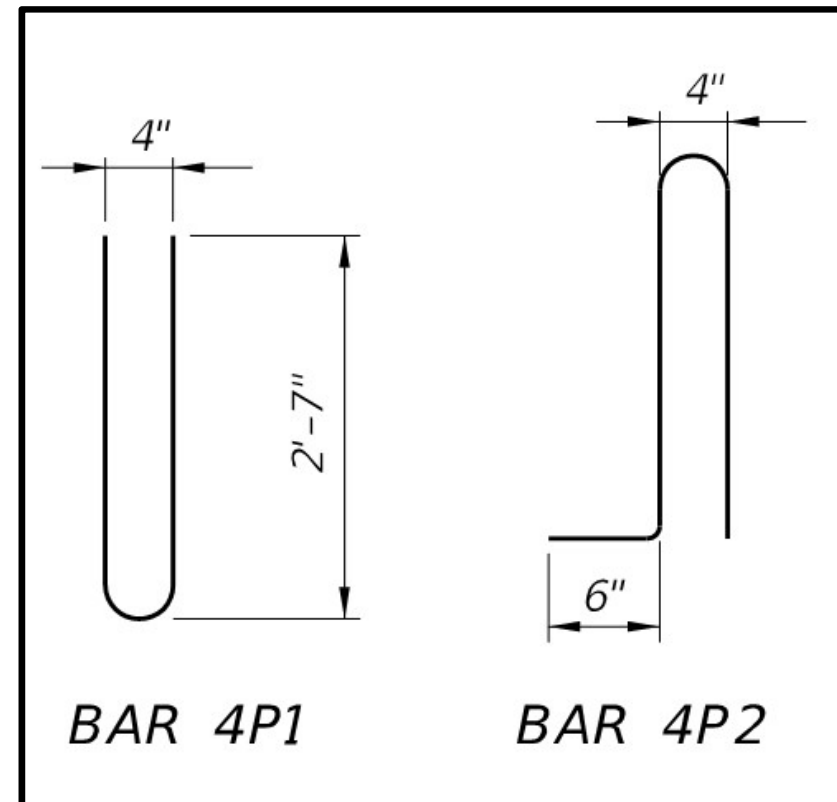
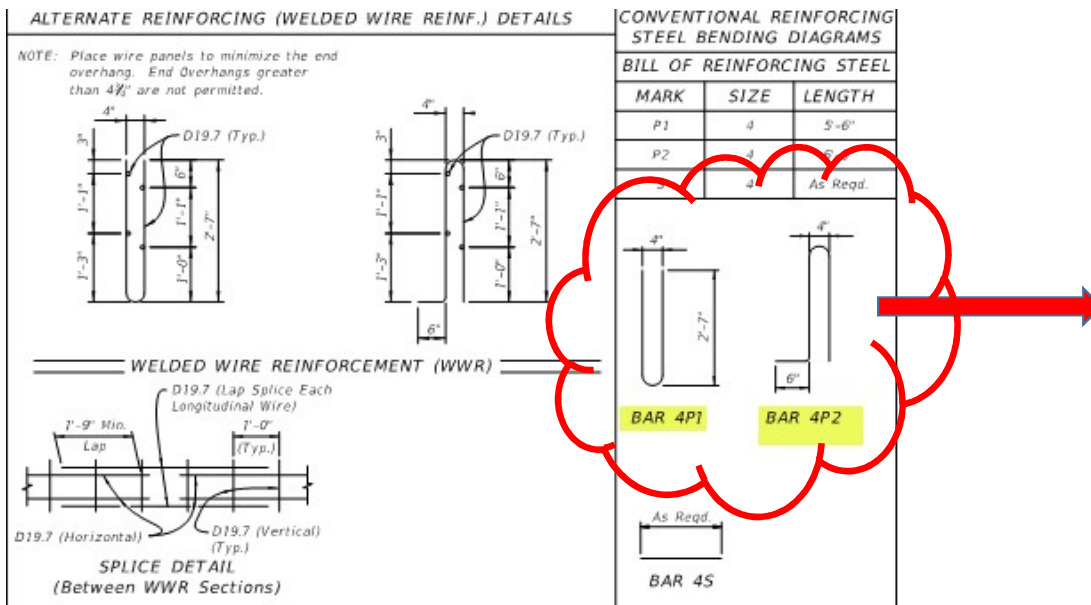
- **Index 521-620: Concrete Barrier/Raised Sidewalk –Wall Coping**
 - *Sheet 2: Added Notes 7 & 8 +*

7. For Bullet Railings, see Index 515-821 and 515-822.
8. Begin placing Railing Bars 5T and 5X at the railing end and proceed toward Retaining Wall to avoid conflict with guardrail bolt holes. If required, adjustments to the bar spacing for Bars 5T and 5X shall be made immediately adjacent to Begin or End Bridge. Cut, shift and rotate Bars 5T and 5X as required to maintain cover in End Transition.

- **Index 521-630: Parapet with C-I-P Sidewalk – Wall Coping**
 - *Sheet 2: Corrected Bar 5U dimension*



- **Index 521-820: 27" Concrete Parapet**
 - Added a Sheet to declutter.
 - Added an optional 4P2 bar shape;
 - Flips Bars 4P1 bar upside down
 - Eliminates the need for protective rebar caps during construction.



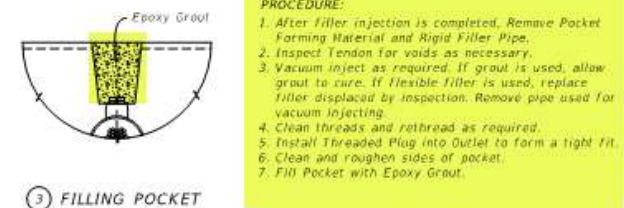
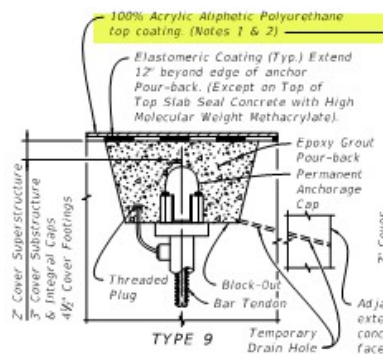
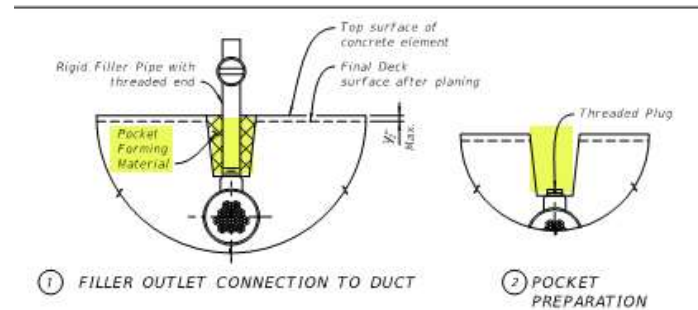
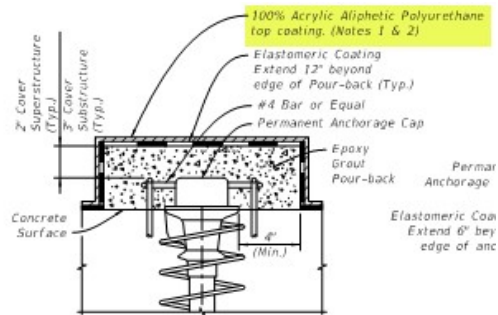
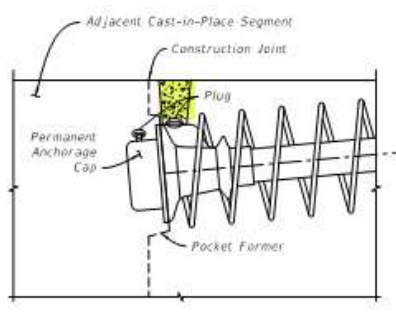
- **Index 534-250: Perimeter Walls**
 - *Changed the Grout strength for ACP to match the Noise Walls*
 - *Issued as an ERRATA earlier this year*

- **Index 630-010: Conduit Details – Embedded**
 - *Clarified that EJB “A” is for double or triple conduit.*

MAJOR REVISIONS

• Index 462-002 & 462-003: Post Tensioning Details

- Added Pockets around Plugs for constructability
- Added polyurethane top coating to drawings (specification requirement)

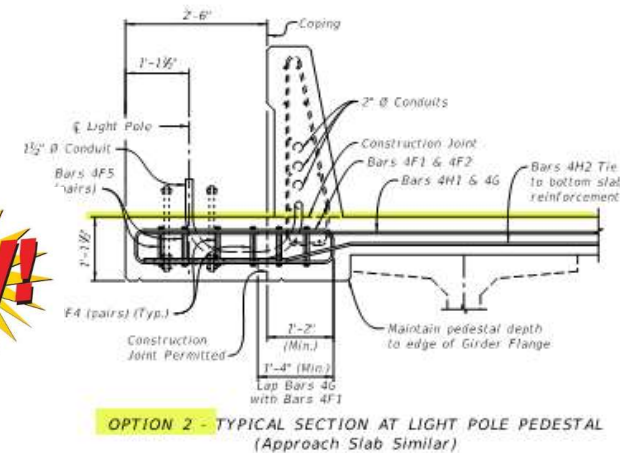
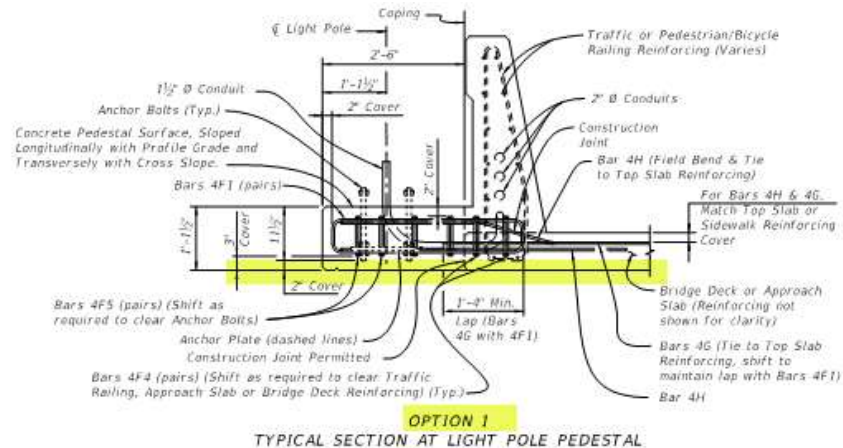


== FILLER OUTLET DETAIL AT HORIZONTAL SURFACES ==

Index 521-660: Light Pole Pedestal - Bridge

Added Options for forming pedestal when deck thickness is less than 1'-5"

- Option 1 is old design with bottom of deck and bottom of pedestal at the same level
- Option 2 is new (added sheet). The top of the pedestal is at the same level as the deck with the bottom of the pedestal below the bottom of the deck level



OPTION 2

Index 548-020: MSE Retaining Wall Systems - Permanent Added Durability Requirements for FRP Reinforcing to Table

	Carbon Steel			FRP									
FDOT MSE RETAINING WALL CLASSIFICATION TABLE													
Applicable FDOT Wall Type *	Durability Requirements (Carbon-Steel Reinforcing)			Durability Requirements (FRP Reinforcing)			Soil Reinforcement Type	Other Allowable FDOT Wall Types					
	Concrete Cover (in.)	Concrete Class for Panels	Pozzolan Additions? **	Concrete Cover (in.)	Concrete Class for Panels	Pozzolan Additions? **		2A	2B	2C	2D	2E	2F
Type 2A	2	II	No	1.5	II	No	Metal		✓	✓	✓	✓	✓
Type 2B	2	IV	No	1.5	IV	No	Metal			✓	✓	✓	✓
Type 2C	3	IV	No	1.5	IV	No	Metal				✓	✓	✓
Type 2D	3	IV	Yes	2	IV	No	Metal					✓	✓
Type 2E	3	IV	No	2	IV	No	Plastic						✓
Type 2F	3	IV	Yes	2	IV	No	Plastic						

* See Data Table in Contract Plans.

** Silica fume, metakaolin or ultrafine fly ash.

Standard Plan Instructions (SPI)

- **102-200 Temporary Detour Bridge Series**
 - ✓ Updated wind pressure coefficients to AASHTO LRFD 8th Edition
- **400-289 Concrete Box Culverts**
 - ✓ Removed references to Roadway Plan Set (must be in Structures Plan Set)
 - ✓ Added references to FDM & SDM sections with more details on what to include in the plan set and where to place the information.
- **450-010 Florida-I Beam**
 - ✓ Noted that beam cambers in the example graphs may not meet SDG camber requirements
- **455-400 & 455-440 Precast Concrete Sheet Pile Walls**
 - ✓ Added Section Modulus and prestress after losses
 - ✓ Information came from SP Index
- **521-509, 510, 513, 514 & 515 Concrete Barrier/Noise Walls**
 - ✓ Changed to allow up to 3 conduits
 - ✓ Added slip forming information

Standard Plan Instructions (SPI)

- **521-660 Light Pole Pedestal – Bridge**
 - ✓ *Clarified Anchor Bolt requirements*
 - ✓ *Clarified pedestal loads.*

- **534-200 Noise Walls**
 - ✓ *Added information/requirements for Alternate Technical Proposals*

Structures Cell Library/Data Tables

<http://www.fdot.gov/design/StandardPlans/Current/DGNs.shtm>

- **Only 2 Updates:**
- ***“Prestressed I-Beam Temporary Bracing Minimum Requirements” (450-010 & 450-120):*** Changed Note 2b – some information moved to SP Indexes.
- ***“Standard Mast Arm Assembly Data Table” (Index 649-030): Deleted Notes 3 & 4 from the cell.***

Update your cells!!

2.) FDOT Structures Menu Data Table Cell Libraries:

(in Microstation format. PDF examples are available in the **Standard Plans Instructions** (SPI).)

TTF-V8semi-standards.cel v2016.3 (Jan 2016 - For use with FY 2016-17 Design Standards. Included in FDOTSS4 MR1 CADD Software Releases)
(0.9MB zip)

TTF-V8semi-standards.cel v2016.4 (Nov 2016 - For use with FY 2017-18 Design Standards. Included in FDOTSS4 MR2 CADD Software Releases, plus missing Data Table 17743 and updated Data Tables 21800B & 21800T)
(0.9MB zip)

TTF-StdDataTables.cel v2017.1 (Nov 2017 - For use with FY 2018-19 Standard Plans. Included in FDOTSS4 MR4 CADD Software Releases, plus updated Data Tables 450-199 & 450-299)
(0.9MB zip)



Updates on other *Developmental Standards*:

- **All**– Updating to new numbering plan as Developmental Designs are refined.
- **D20450 series** – Florida Slab Beam:
 - May be added to Standard Plans Next Year.
 - Developing details for attaching exterior beam form work and
 - Details for a Link Slab



Structures Innovation Web-Site - Updates

Ultra-High Performance Concrete just added!

<http://alpha.dot.state.fl.us/structures/innovation/UHPC.shtm>

We are here to assist you with your questions and concerns. Please contact us:

- **If you have a suggestion:**
 - for a new standard or
 - for an improvement to an existing standard
 - Find an error (of any type).

- **If you have any issues during design or construction:**
 - Fully explain the issue (photos/drawings help);
 - Provide suggestions (if you have any);
 - Provide any documentation that might support a proposed change.

- **Anytime you have questions or concerns** (*but, we recommend always thoroughly reviewing the SPI first*).

- **Remember there is a long lead time to publishing**





Contact Information:
Cheryl Hudson, P.E.
State Structures Design Office
Cheryl.Hudson@dot.state.fl.us
(850) 414-5332



- **Who do you call?**

- **Andre Pavlov – Supervisor: Design Technology**
- **Ge Wan – Structures Programs**
- **Cheryl Hudson – Standards**
- **Tharu Koshy – Programs & Standards**