FY 2019-20 Standard Plans
Update Training

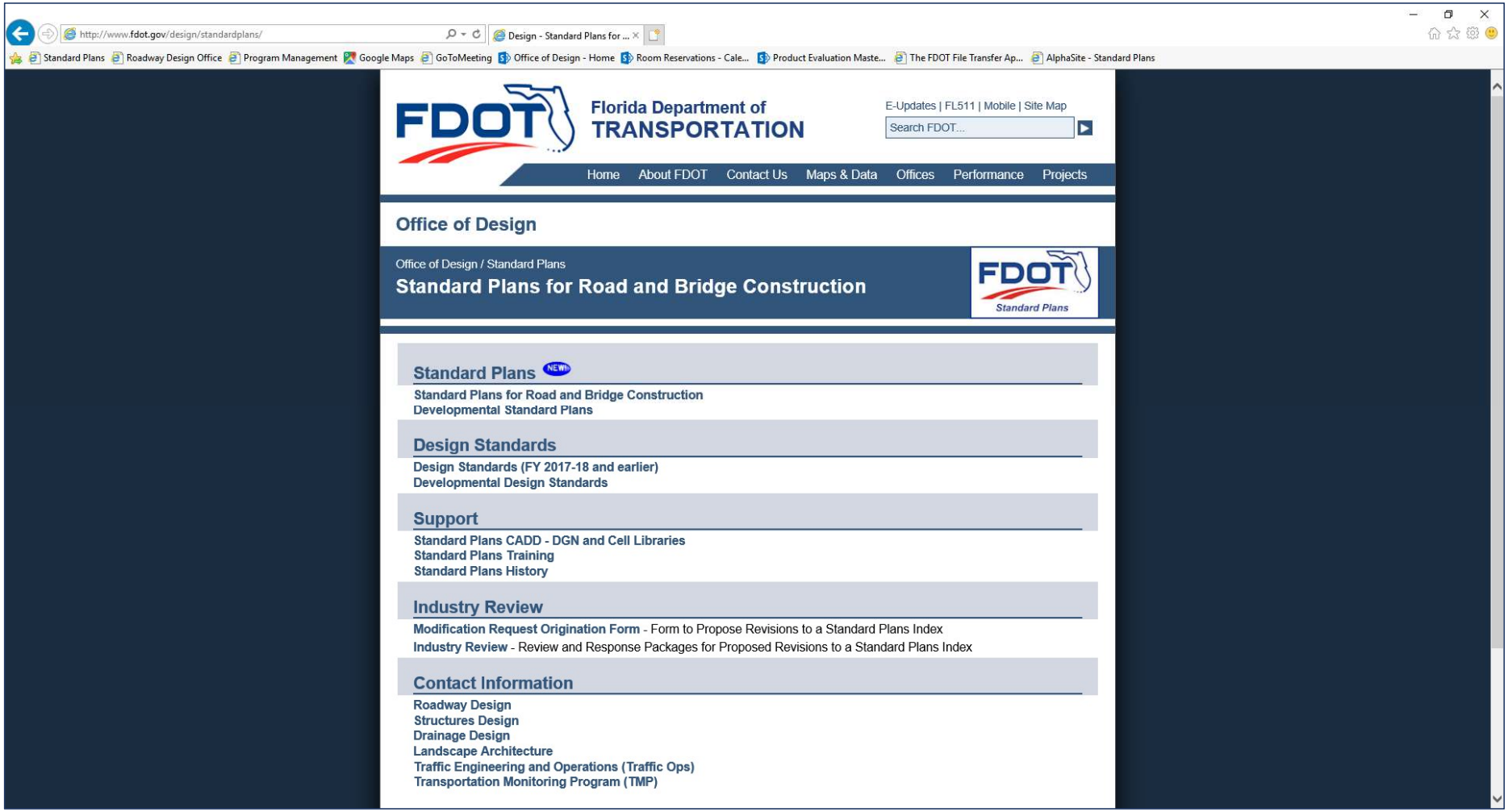
Derwood Sheppard, P.E., M.Eng.
Standard Plans Publication Engineer
Central Office, Roadway Design
(850) 414-4334
derwood.sheppard@dot.state.fl.us

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

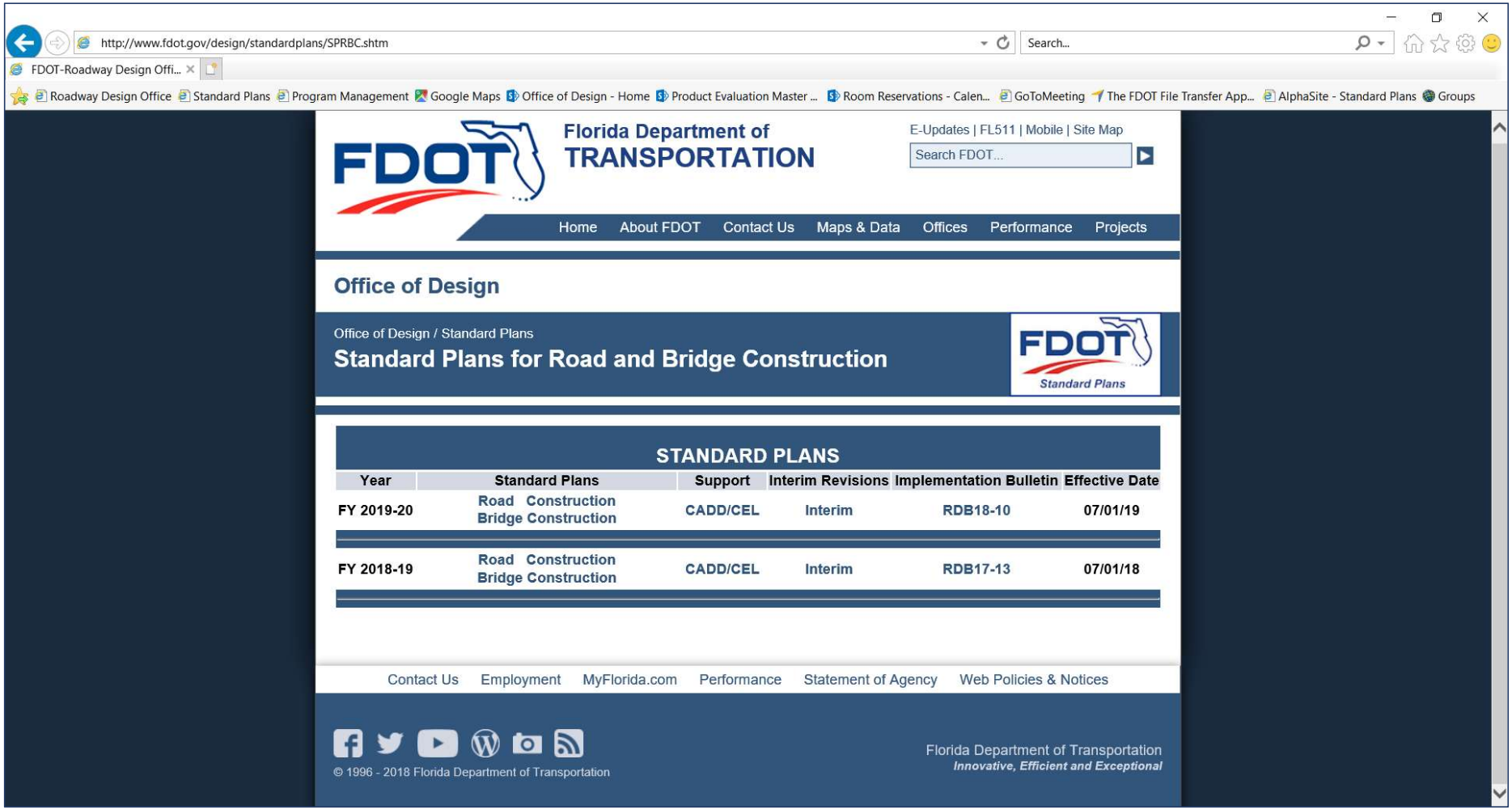
Standard Plans – New Website

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



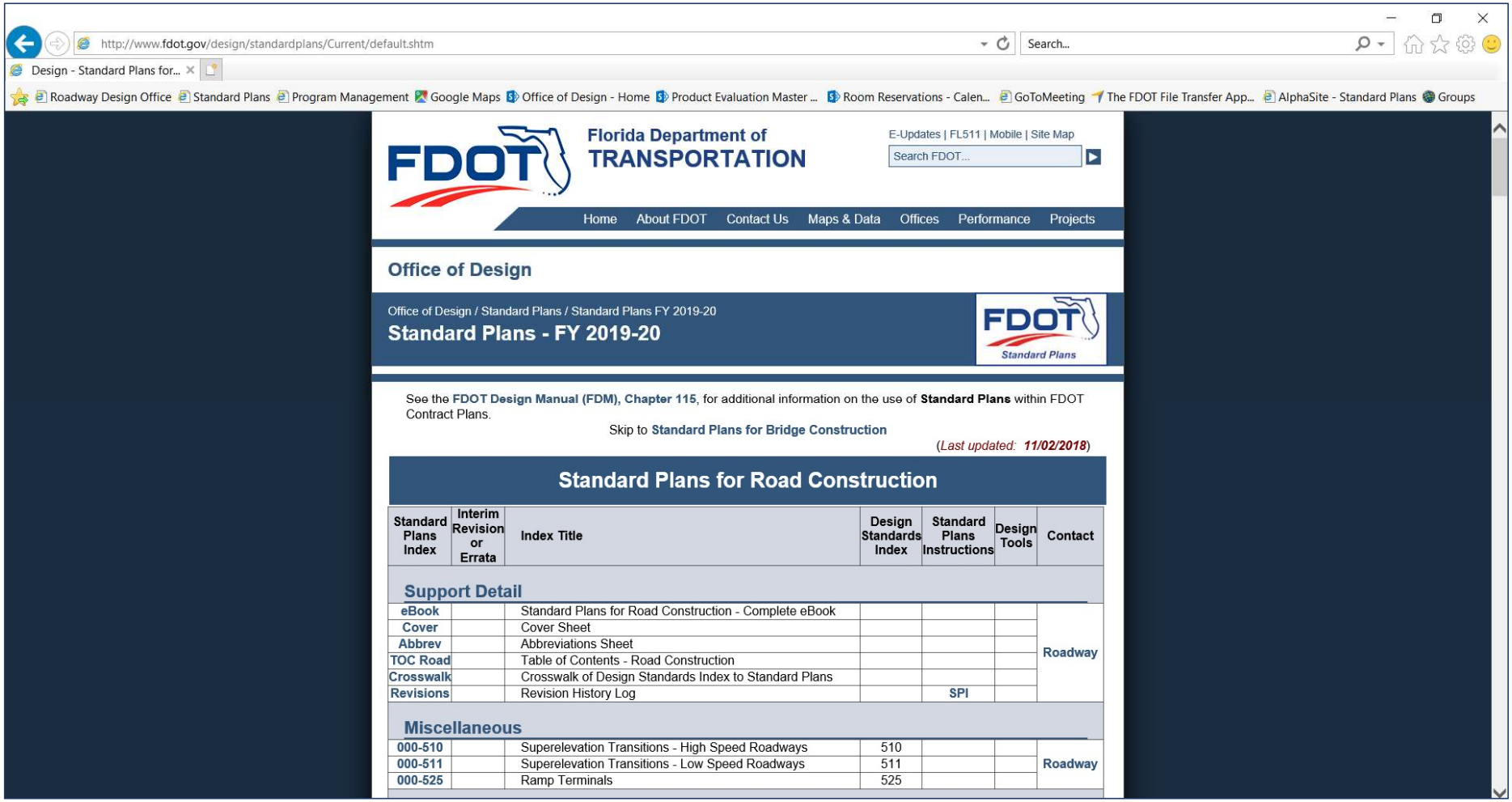
Standard Plans – New Website

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



Standard Plans – New Website

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



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

Design - Standard Plans for...

Roadway Design Office | Standard Plans | Program Management | Google Maps | Office of Design - Home | Product Evaluation Master ... | Room Reservations - Calen... | GoToMeeting | The FDOT File Transfer App... | AlphaSite - Standard Plans | Groups

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 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			

Standard Plans – Revision History

Revision Log:

STANDARD PLANS
FY 2019-20 REVISIONS LOG

Standard Plans Index	Description
000-506	Changed to Index 160-001.
000-510	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.
000-511	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.
000-515	Deleted Index, Criteria information moved to New FDM Chapter 214. Construction details moved to New Indexes 522-003 or 330-001.
000-516	Deleted Index and moved information to Index 330-001.
102-200	Sheet 1: "STORAGE FACILITY" Note; Changed phone number to 407-278-2727.
102-600	Sheet 3: Updated "LENGTH OF LANE CLOSURES" Note. Sheet 9: Changed "DROP-OFF CONDITION NOTES" Note 5.
102-655	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.

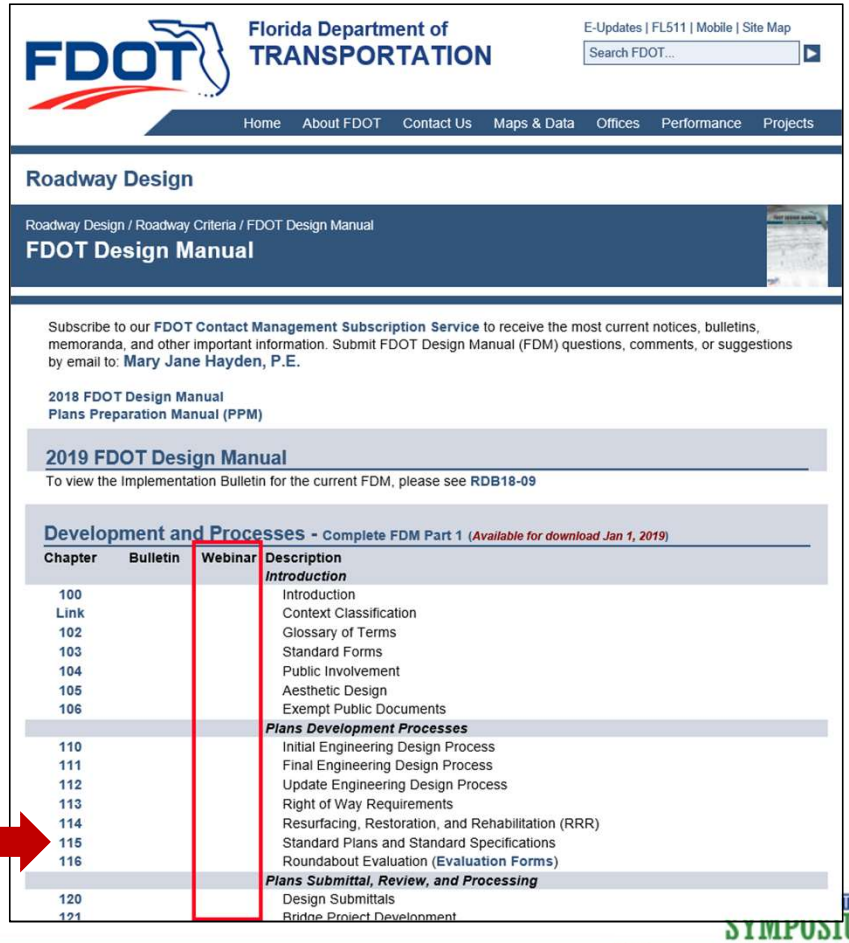
2019 FDOT Design Manual Updates

Individual Chapter Webinars

- **Coming Soon!!**
- **Announcement will be sent out**

FDM 115

www.fdot.gov/roadway/fdm



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

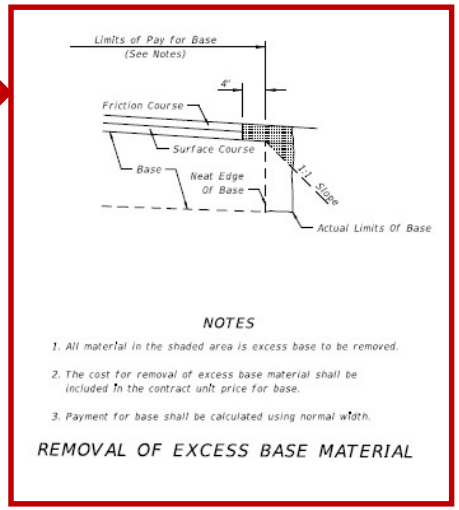
g) Index 522-002 - Detectable Warnings and Sidewalk Curb Ramps

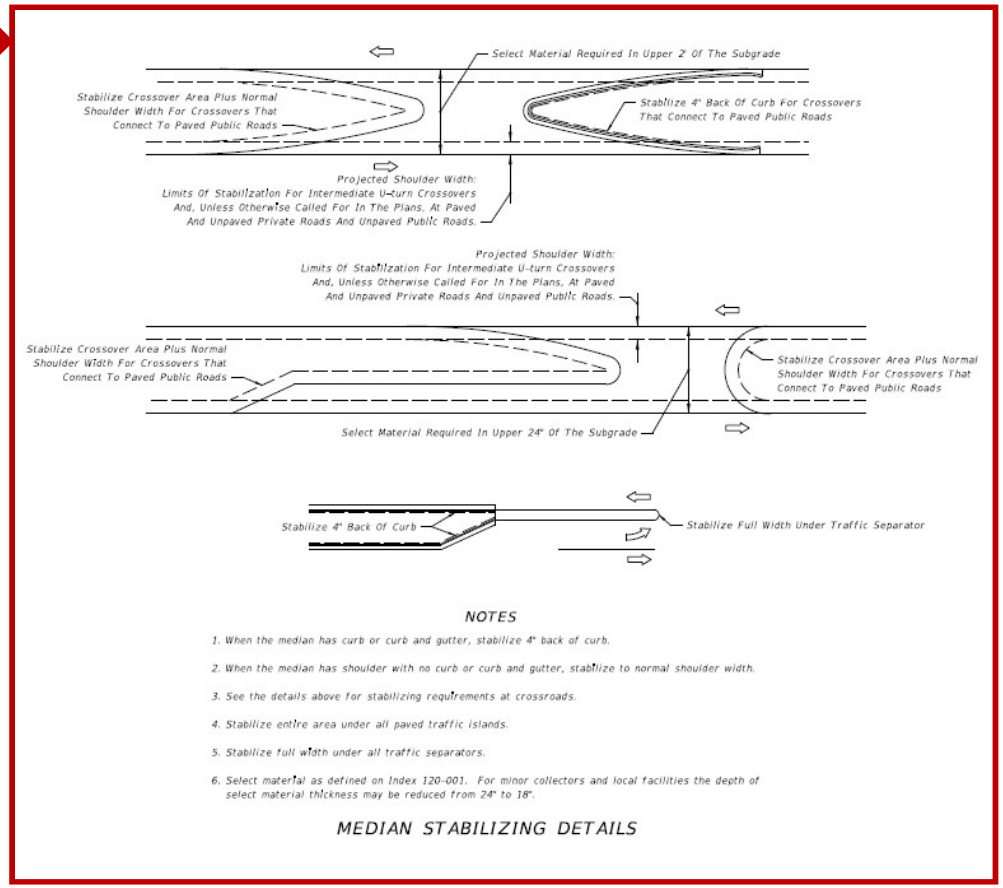
h) Misc. Traffic Control Signals and Devices (Including: Indexes 630-001, 634-002, 635-001, 659-010, 660-001, and 676-010

Miscellaneous Earthwork Details, Old Index 000-506

Re-Indexed 160-001: Stabilization Details

Index 120-001: Excess Base Materials Information Relocated



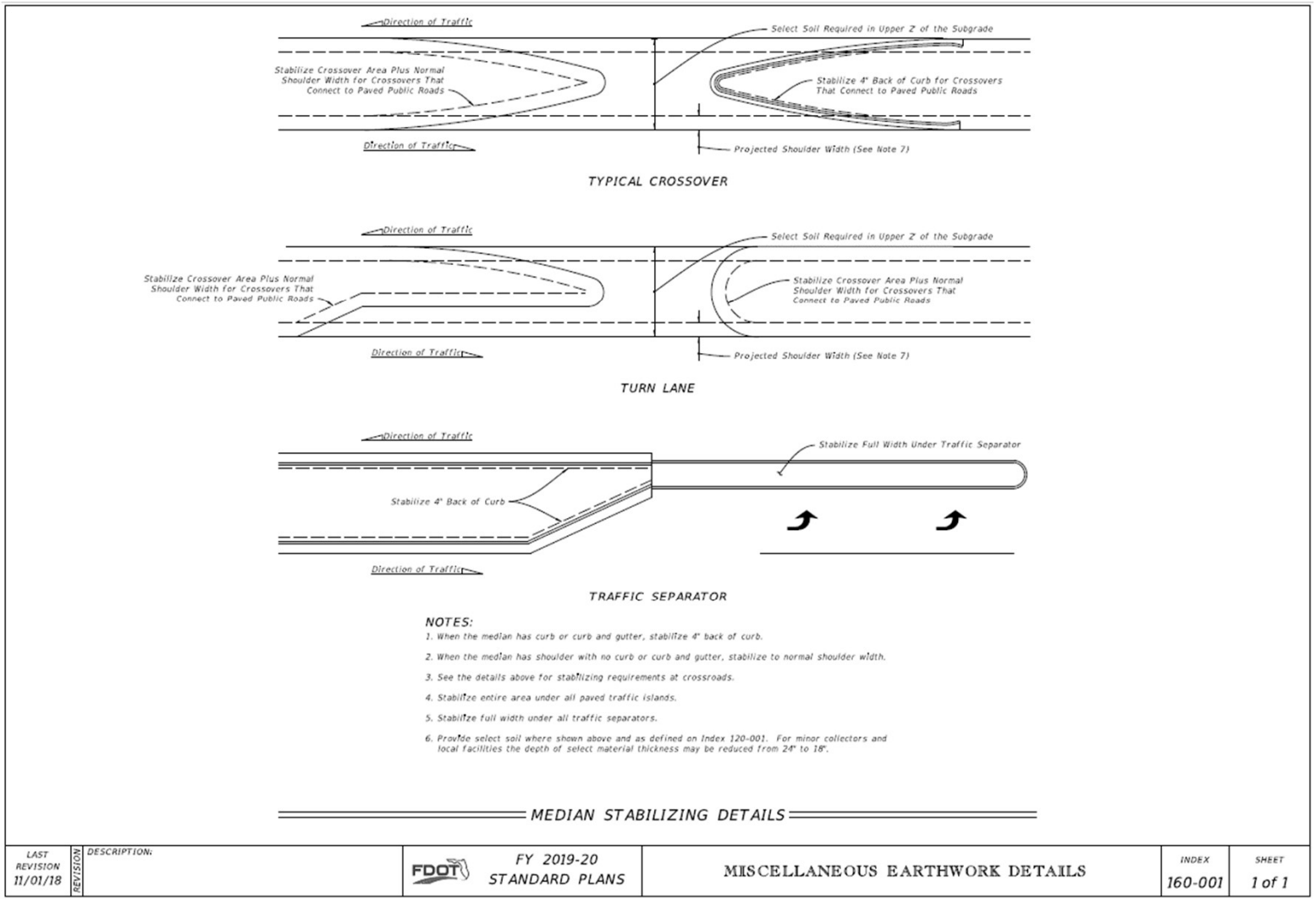


LAST REVISION 11/01/17	REVISION	DESCRIPTION:	FDOT FY 2018-19 STANDARD PLANS	MISCELLANEOUS EARTHWORK DETAILS	INDEX 000-506	SHEET 1 of 1

Miscellaneous Earthwork Details, Index 160-001

New Index 160-001:
Median Stabilizing Details

Specification 160 (*Stabilizing*)

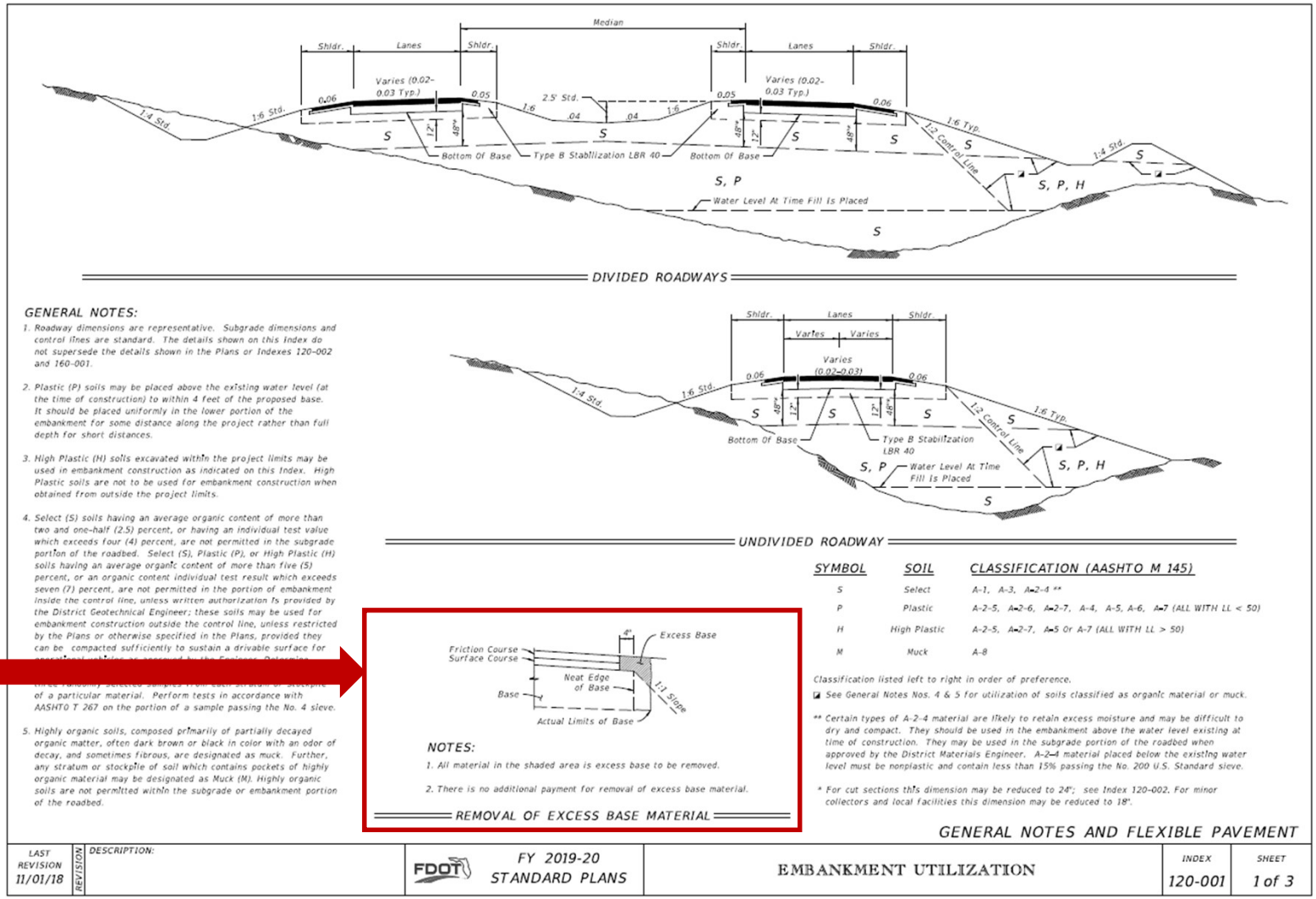


Embankment Utilization, Index 120-001

Updated:

- **Layout Style**
- **General Notes**

Removal of Excess Base Material



Embankment Utilization, Index 120-001

Removal of Treated Permeable Base Option

Departments Preference now:

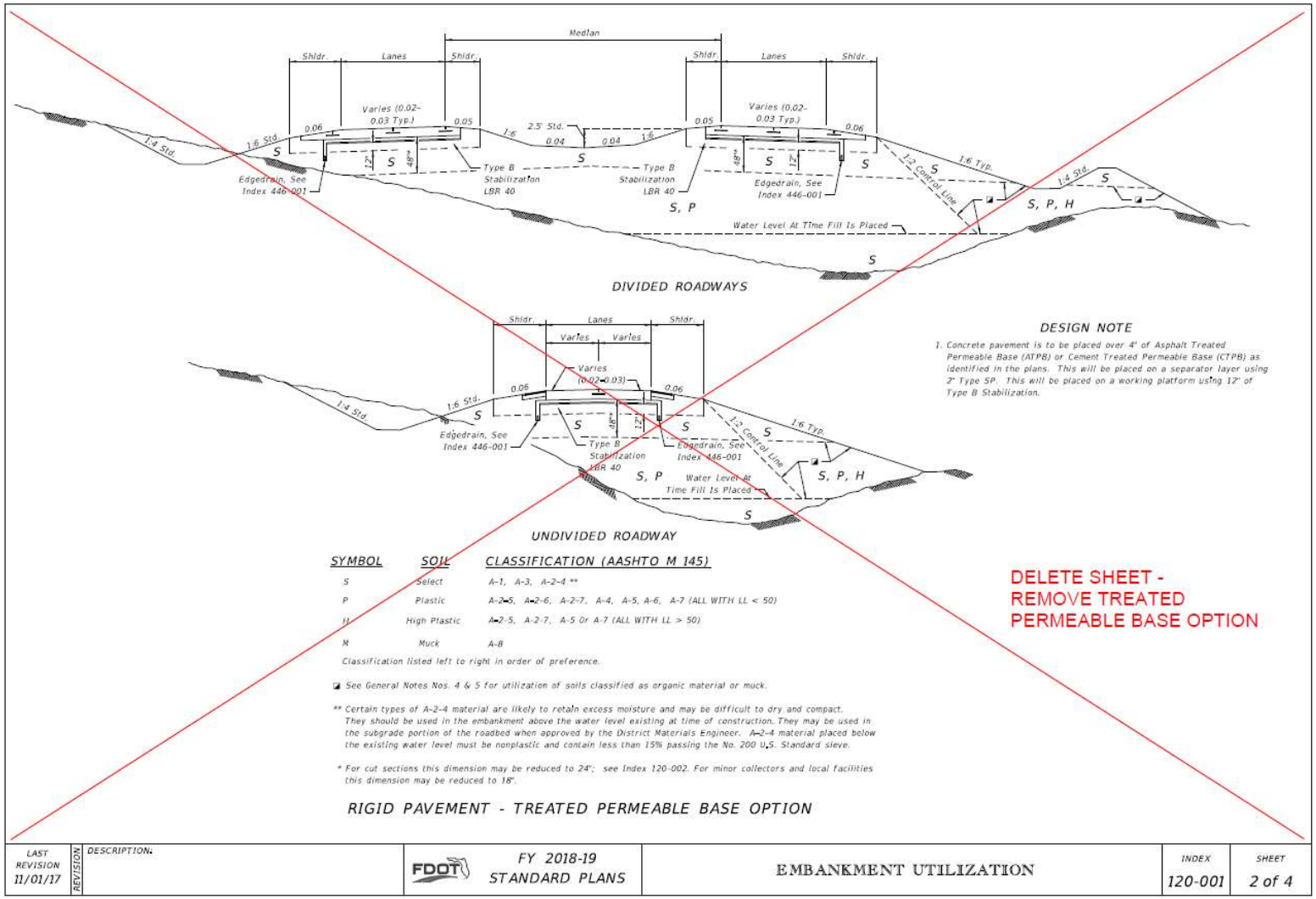
- **Asphalt Base**

  Or

- **Special Select Soils**

Refer to:

Rigid Pavement Design Manual



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***

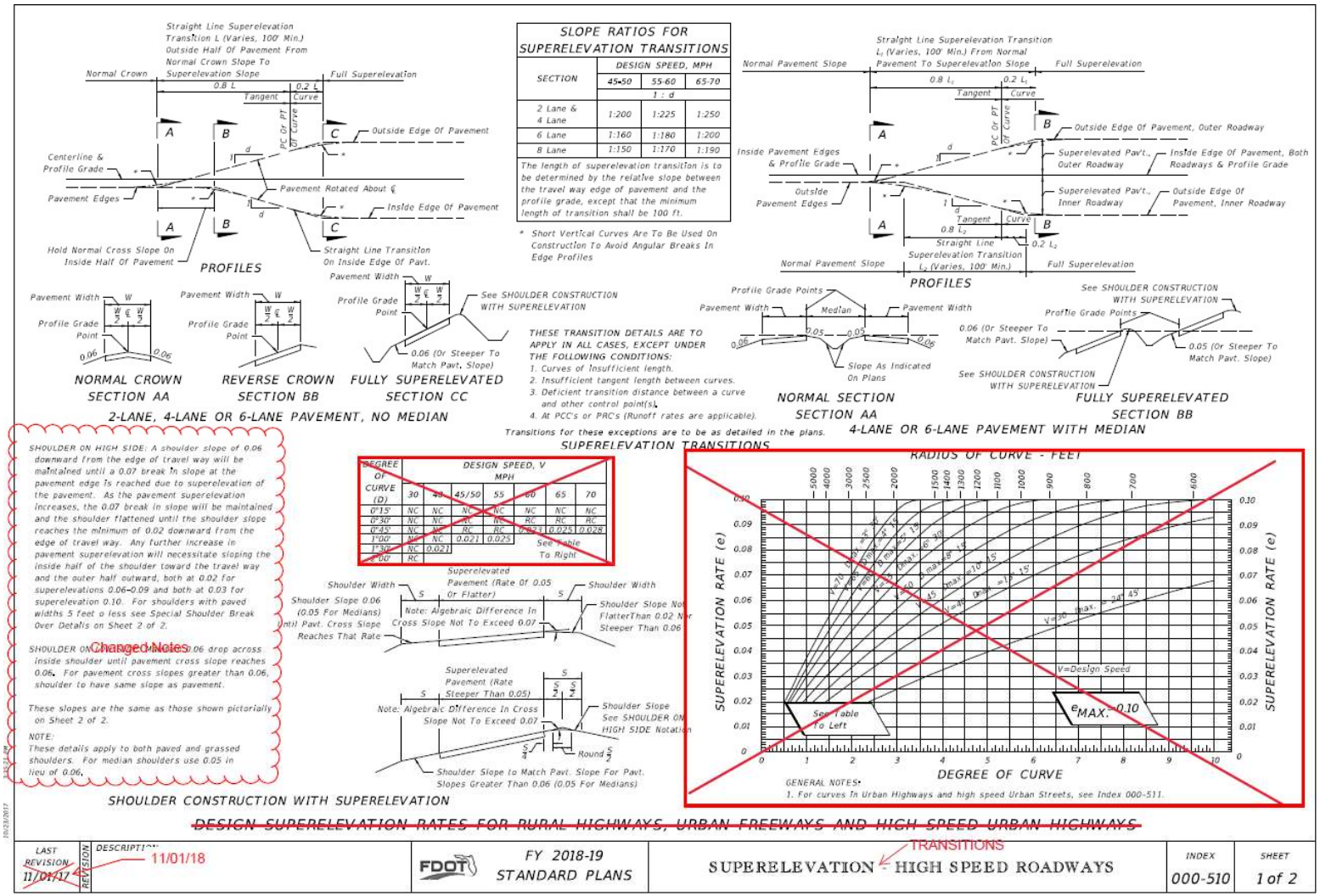
f) ***Index 522-001 - Concrete Sidewalk***

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***

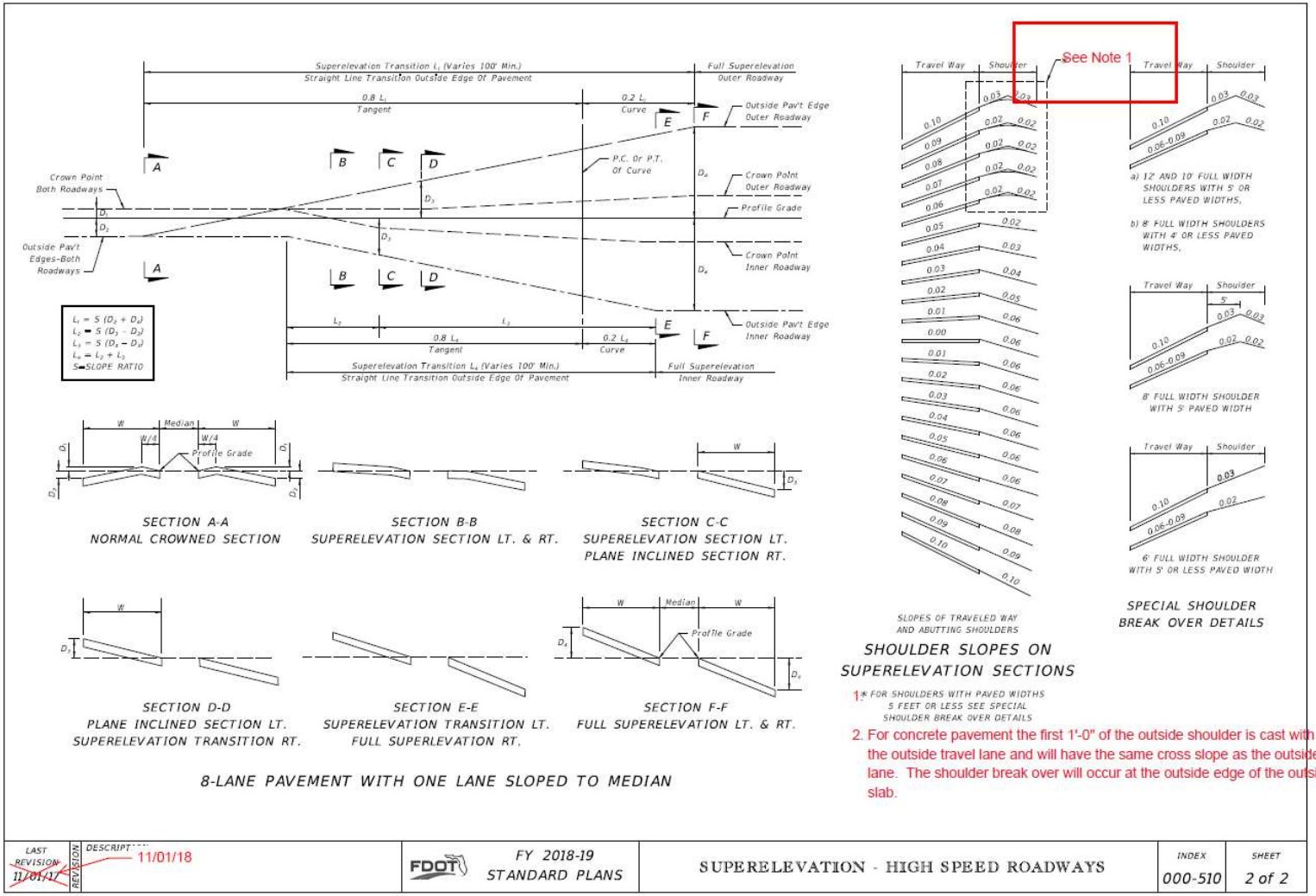
Superelevations – High Speed Roadways, Index 000-510

Removed Redundant Information Included in FDM 210.9



Superelevations – High Speed Roadways, Index 000-510

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***

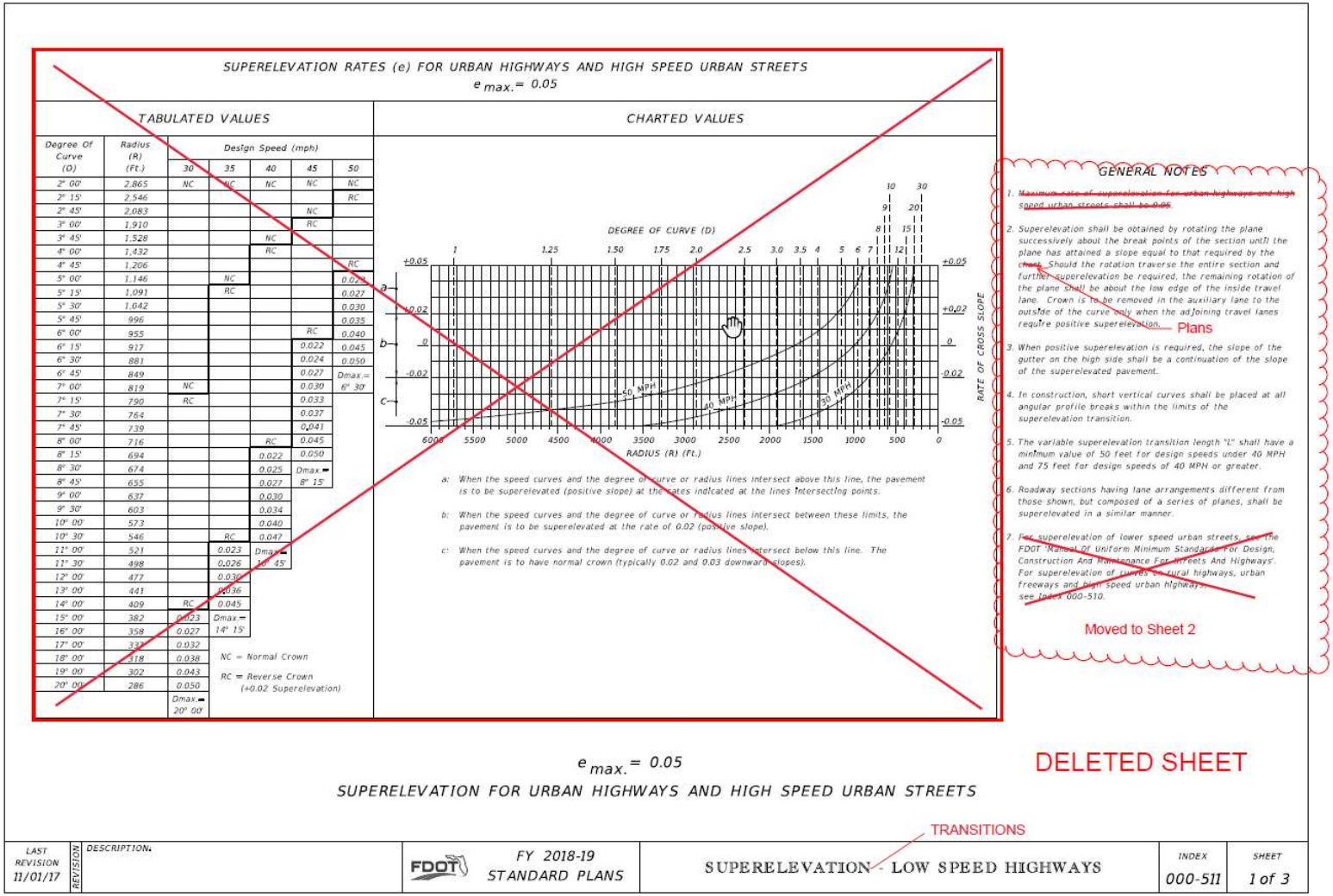
f) ***Index 522-001 - Concrete Sidewalk***

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



SUPERELEVATION RATES (e) FOR URBAN HIGHWAYS AND HIGH SPEED URBAN STREETS

$e_{max.} = 0.05$

TABULATED VALUES

Degree Of Curve (D)	Radius (R) (Ft.)	Design Speed (mph) 30	35	40	45	50
2° 00'	2,865	NC	NC	NC	NC	NC
2° 15'	2,546					RC
2° 45'	2,083				NC	
3° 00'	1,910				RC	
3° 45'	1,528			NC		
4° 00'	1,432			RC		
4° 45'	1,206					RC
5° 00'	1,146		NC			0.020
5° 15'	1,091		RC			0.027
5° 30'	1,042					0.030
5° 45'	996					0.035
6° 00'	955				RC	0.040
6° 15'	917				0.022	0.045
6° 30'	881				0.024	0.050
6° 45'	849				0.027	Dmax.= 6° 30'
7° 00'	819	NC			0.030	
7° 15'	790	RC			0.033	
7° 30'	764				0.037	
7° 45'	739				0.041	
8° 00'	716			RC	0.045	
8° 15'	694			0.022	0.050	
8° 30'	674			0.025	Dmax.= 8° 15'	
8° 45'	655			0.027		
9° 00'	637			0.030		
9° 30'	603			0.034		
10° 00'	573			0.040		
10° 30'	546		RC	0.047		
11° 00'	521		0.023	Dmax.= 10° 45'		
11° 30'	498		0.026			
12° 00'	477		0.030			
13° 00'	441		0.036			
14° 00'	409	RC	0.045			
15° 00'	382	0.023	Dmax.= 14° 15'			
16° 00'	358	0.027				
17° 00'	337	0.032				
18° 00'	318	0.038				
19° 00'	302	0.043				
20° 00'	286	0.050				
		Dmax.= 20° 00'				

NC = Normal Crown

RC = Reverse Crown (+0.02 Superelevation)

CHARTED VALUES

a: When the speed curves and the degree of curve or radius lines intersect above this line, the pavement is to be superelevated (positive slope) at the rates indicated at the lines intersecting points.

b: When the speed curves and the degree of curve or radius lines intersect between these limits, the pavement is to be superelevated at the rate of 0.02 (positive slope).

c: When the speed curves and the degree of curve or radius lines intersect below this line. The pavement is to have normal crown (typically 0.02 and 0.03 downward slopes).

GENERAL NOTES

1. ~~Maximum rate of superelevation for urban highways and high speed urban streets shall be 0.05~~
2. 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 auxiliary lane to the outside of the curve only when the adjoining travel lanes require positive superelevation. Plans
3. 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.
4. In construction, short vertical curves shall be placed at all angular profile breaks within the limits of the superelevation transition.
5. 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.
6. Roadway sections having lane arrangements different from those shown, but composed of a series of planes, shall be superelevated in a similar manner.
7. ~~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

$e_{max.} = 0.05$

SUPERELEVATION FOR URBAN HIGHWAYS AND HIGH SPEED URBAN STREETS

DELETED SHEET

TRANSITIONS

LAST REVISION	REVISION	DESCRIPTION.	FDOT	FY 2018-19 STANDARD PLANS	SUPERELEVATION - LOW SPEED HIGHWAYS	INDEX	SHEET
11/01/17						000-511	1 of 3

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*

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

Redevelopment Effort:

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

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. (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.					

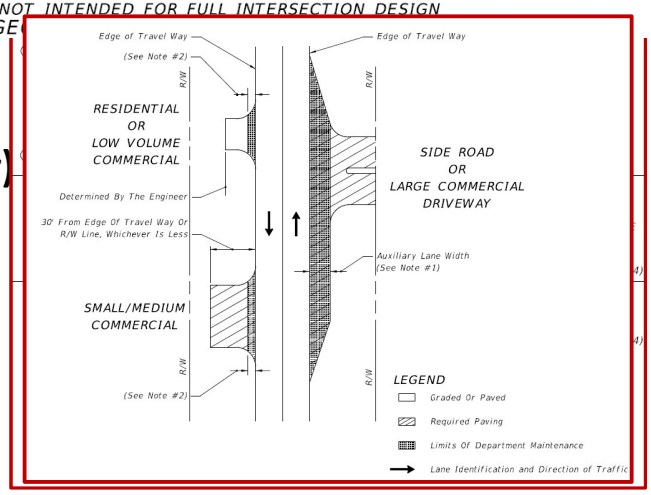
◪ Side road intersection design, with possible auxiliary lanes and channelization, may be necessary. Intersection design, with possible auxiliary lanes and channelization, should be considered for connections with more than 4000 trips/days.
□ "2-Way" refers to one "in" movement and one "out" movement 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 GE

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

iveways)

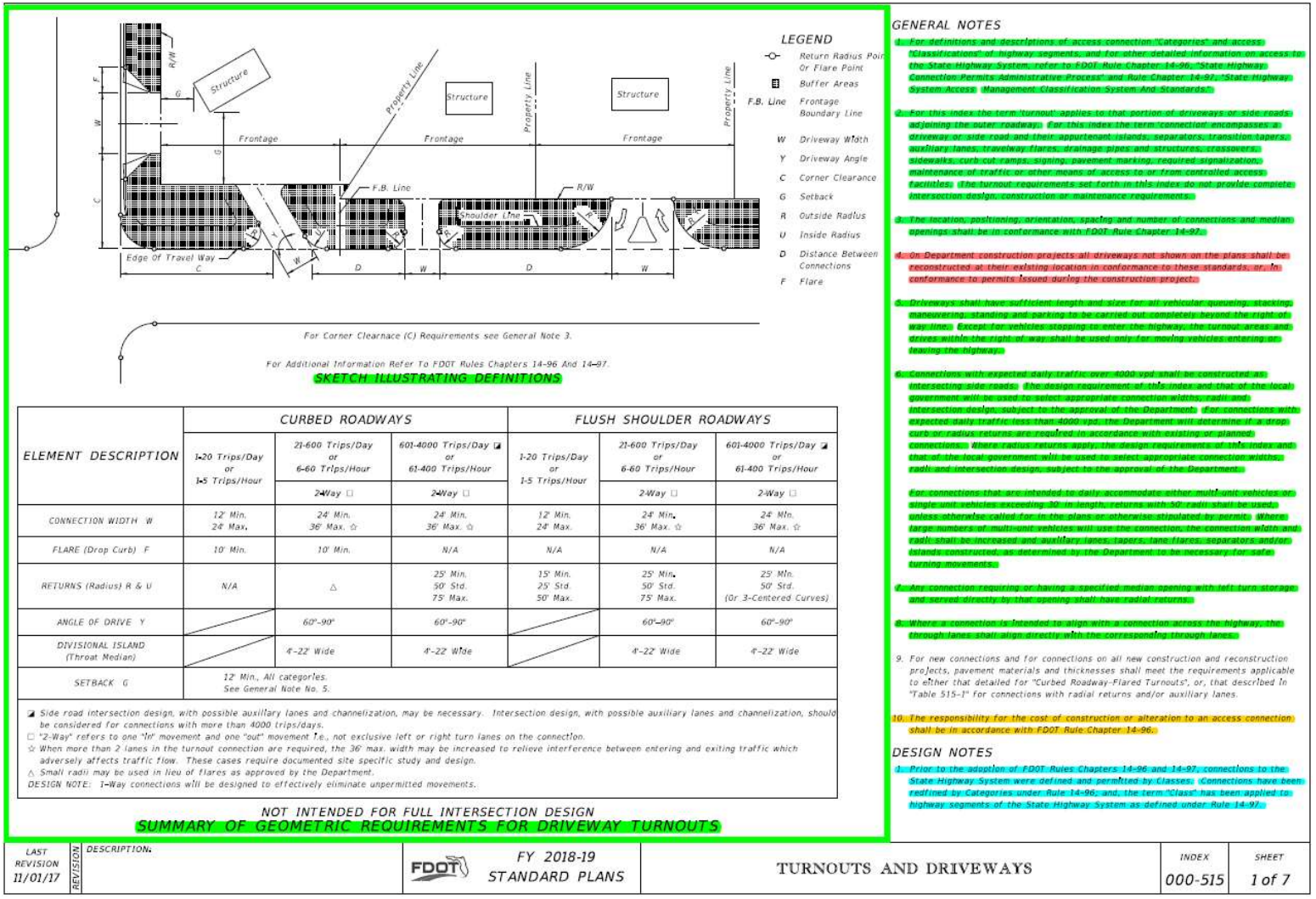


- **Index 522-003 (Concrete Driveways)**
- **Index 330-001 (Paved and Graded Driveways)**

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

Old SHEET 1 of 7:

Content Moved to *FDM 214*



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. (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 FOR DRIVEWAY TURNOUTS

GENERAL NOTES

1. 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 Connection Permits Administrative Process" and Rule Chapter 14-97, "State Highway System Access Management Classification System And Standards."

2. For this index the term "turnout" applies to that portion of driveways or side roads adjoining the outer roadway. For this index the term "connection" encompasses a driveway or side road and their appurtenant islands, separators, transition tapers, auxiliary lanes, travelway flares, drainage pipes and structures, crossovers, sidewalks, curb cut ramps, signing, pavement marking, required signalization, maintenance of traffic or 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.

3. The location, positioning, orientation, spacing and number of connections and median openings shall be in conformance with FDOT Rule Chapter 14-97.

4. 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.

5. Driveways shall have sufficient length and size for all vehicular 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 moving vehicles entering or leaving the highway.

6. Connections with expected daily traffic over 4000 vpd shall be constructed as intersecting side roads. The design requirement of this index and that of the local government will be used to select appropriate connection widths, radii and intersection design, subject to the approval of the Department. For connections with expected daily traffic less than 4000 vpd, the Department will determine if a drop curb or radius returns are required in accordance with existing or planned connections. Where radius returns apply, the design requirements of this index and that of the local government will be used to select appropriate connection widths, radii and intersection design, subject to the approval of the Department.

For connections that are intended to daily 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 permit. Where large numbers of multi-unit vehicles will use the connection, the connection width and radii shall be increased and auxiliary lanes, tapers, lane flares, separators and/or islands constructed, as determined by the Department to be necessary for safe turning movements.

7. Any connection requiring or having a specified median opening with left turn storage and served directly by that opening shall have radial returns.

8. Where a connection is intended to align with a connection across the highway, the through lanes shall align directly with the corresponding through lanes.

9. 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.

10. 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

1. 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 redfined 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.

LAST REVISION 11/01/17	REVISION	DESCRIPTION.	FDOT FY 2018-19 STANDARD PLANS	TURNOUTS AND DRIVEWAYS	INDEX 000-515	SHEET 1 of 7

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

Old SHEET 6 of 7:

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

MATERIAL TYPES AND THICKNESSES IN DRIVING AREAS FOR ALL CONNECTIONS

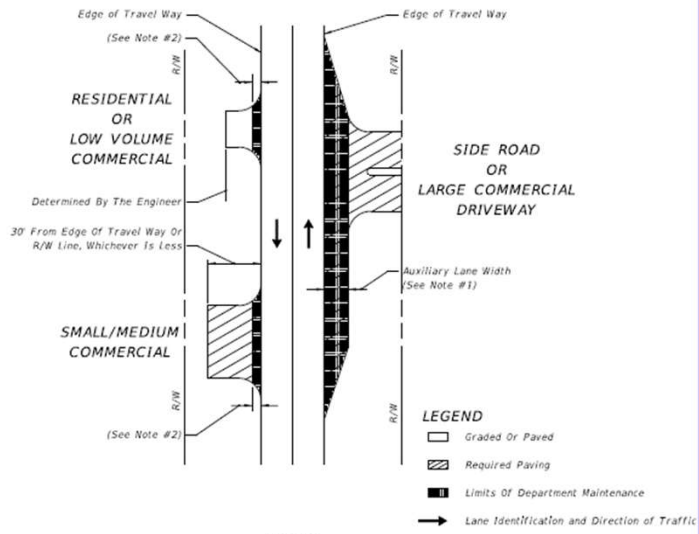
Course	Materials ②	Thickness (in.) ①	
		Connections ③	Roadway ④
Structural	Asphaltic Concrete	1"	1½"
Bases	Optional Base (See Spec. Section 285)	0.B.G. 1	0.B.G. 3

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

1. 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.
2. 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.
3. 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.
4. A structural course is required for flexible pavements when they are used for auxiliary lanes serving more than a single connection.
5. 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.
6. The Department may require other pavement criteria where local conditions warrant.

PAVEMENT STRUCTURE FOR TURNOUTS AND AUXILIARY LANES
TABLE 515-1



NOTES

1. Auxiliary lane pavements and crossover pavements shall be maintained by the Department.
2. 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.
3. 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.
4. The maintenance and operation of highway lighting, traffic signals, associated equipment, and other necessary devices shall be the responsibility of a public agency.
5. 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.
6. 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.

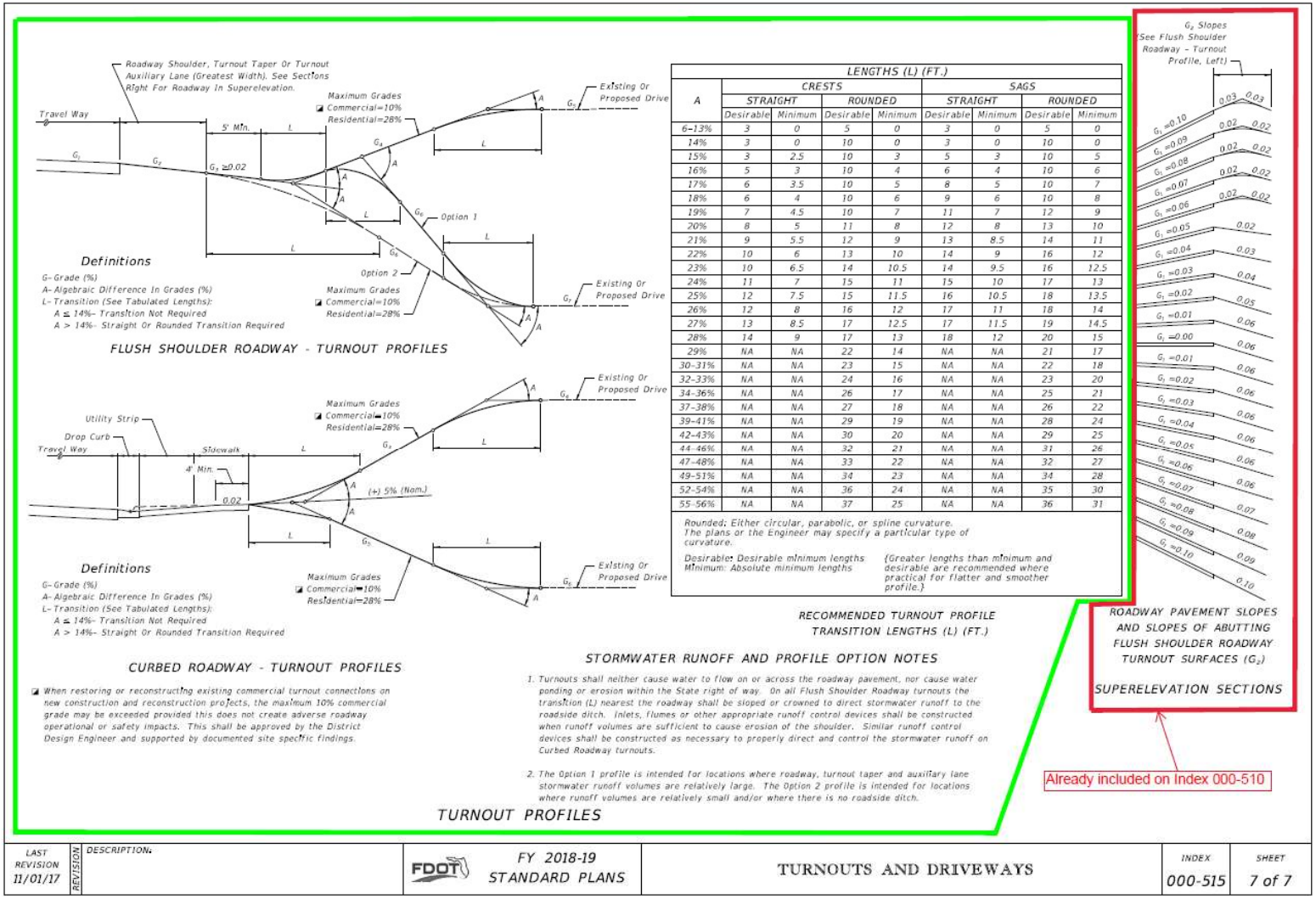
LIMITS OF CONSTRUCTION AND MAINTENANCE FOR FLUSH SHOULDER ROADWAY CONNECTIONS

LAST REVISION 11/01/17	REVISION DESCRIPTION.	FDOT FY 2018-19 STANDARD PLANS	TURNOUTS AND DRIVEWAYS	INDEX 000-515	SHEET 6 of 7

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

Old SHEET 7 of 7:

Content Moved to *FDM 214*



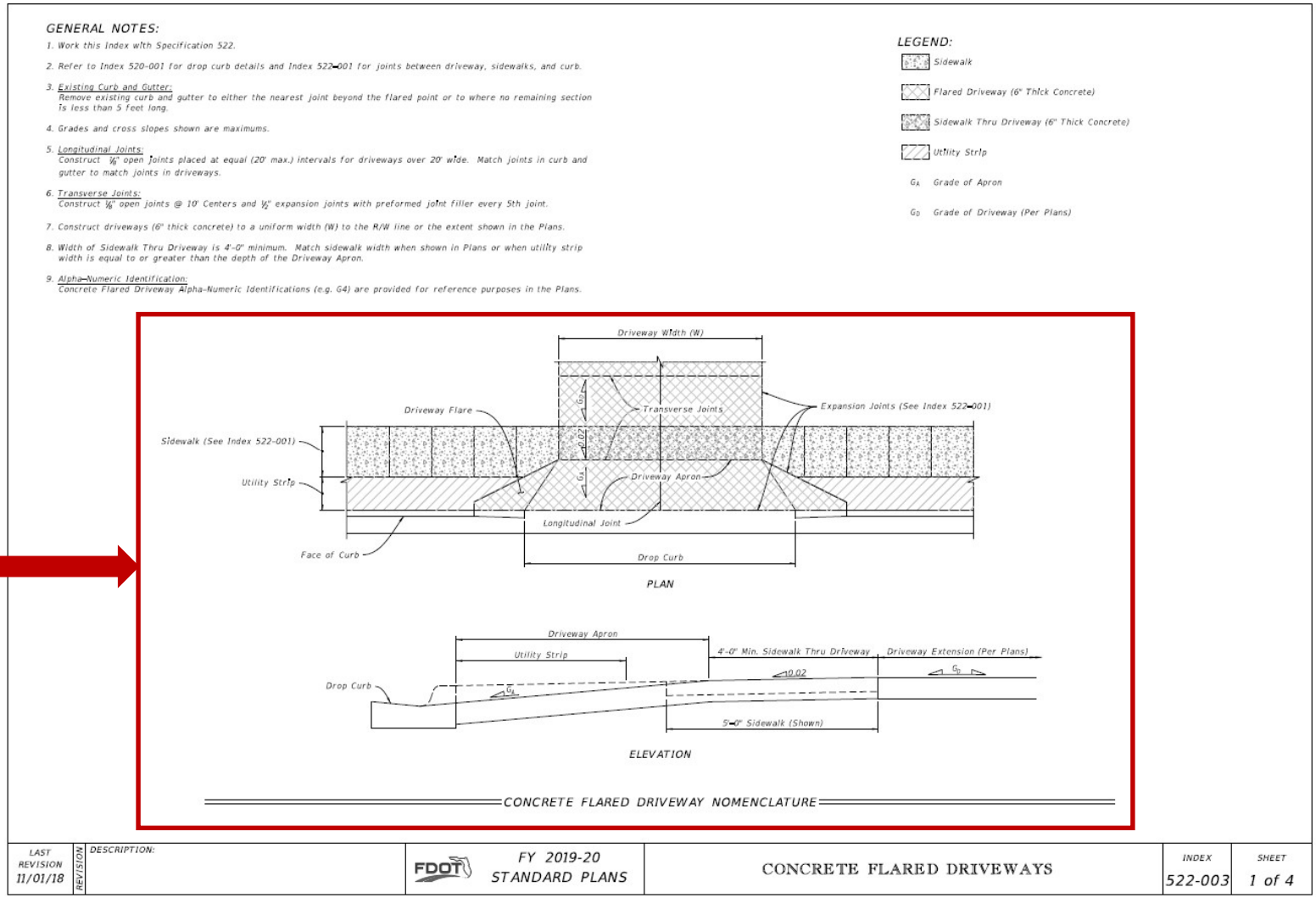
NEW - Concrete Flared Driveways, Index 522-003

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 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 1/8" open joints @ 10' Centers and 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.

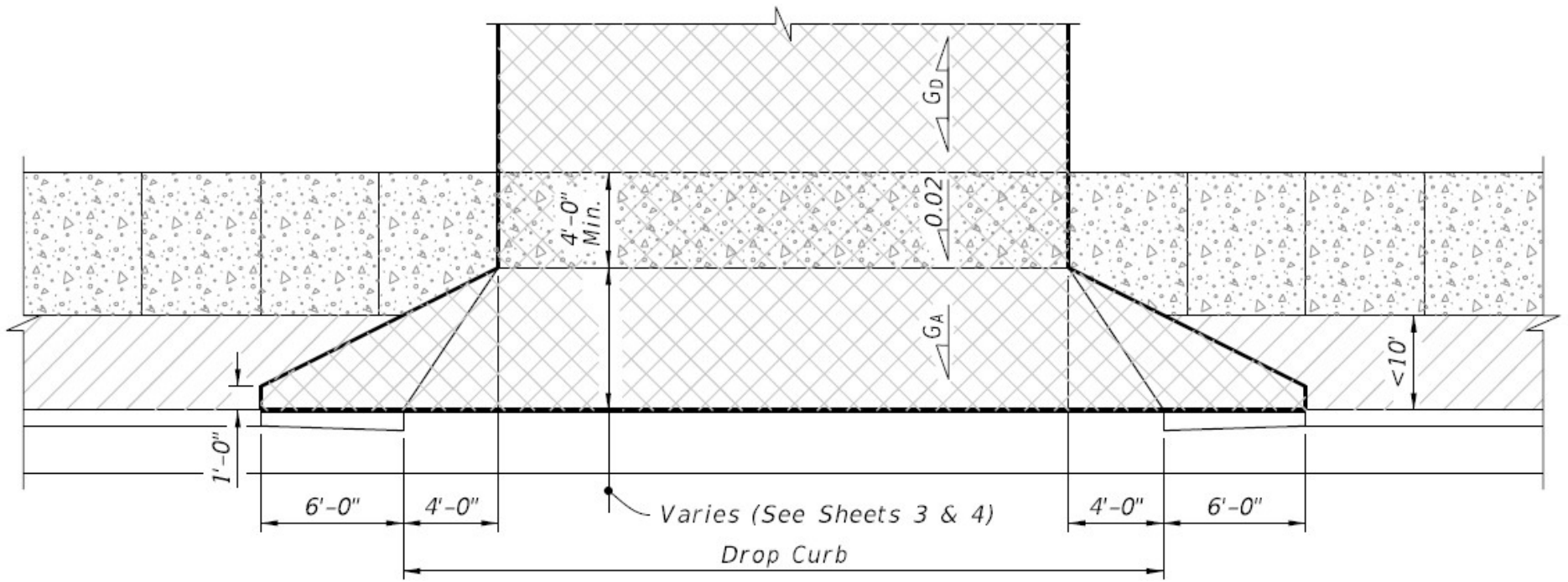
LEGEND:

- 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)

CONCRETE FLARED DRIVEWAY NOMENCLATURE

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

NEW - Concrete Flared Driveways, Index 522-003



UTILITY STRIP < 10' WIDE

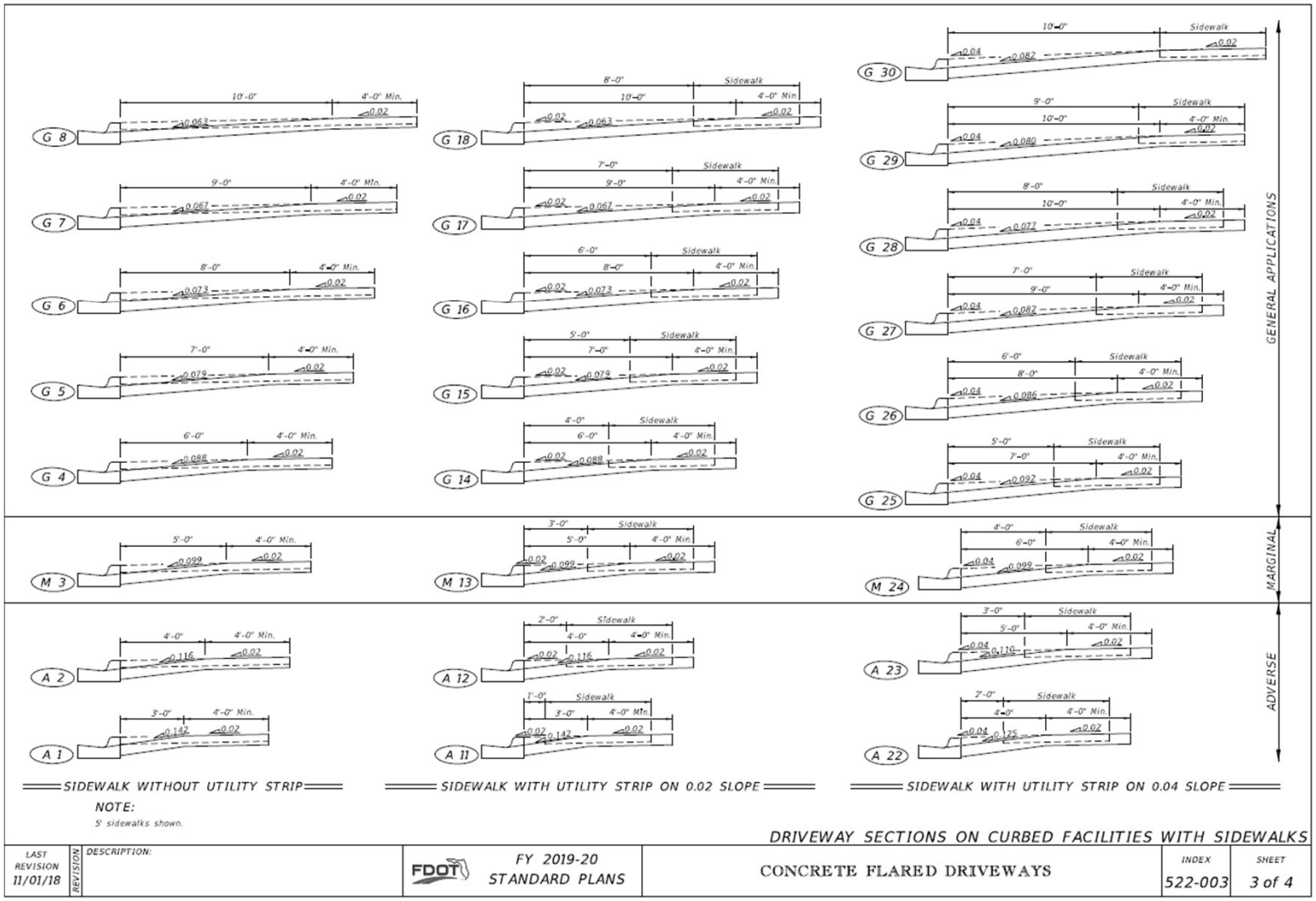
NEW - Concrete Flared Driveways, Index 522-003

SHEET 3 of 4:

Typical Driveway Profiles: Alpha-Numeric Identifications

Details from Old *Index 000-515*

Sheet 4 of 4 Similar



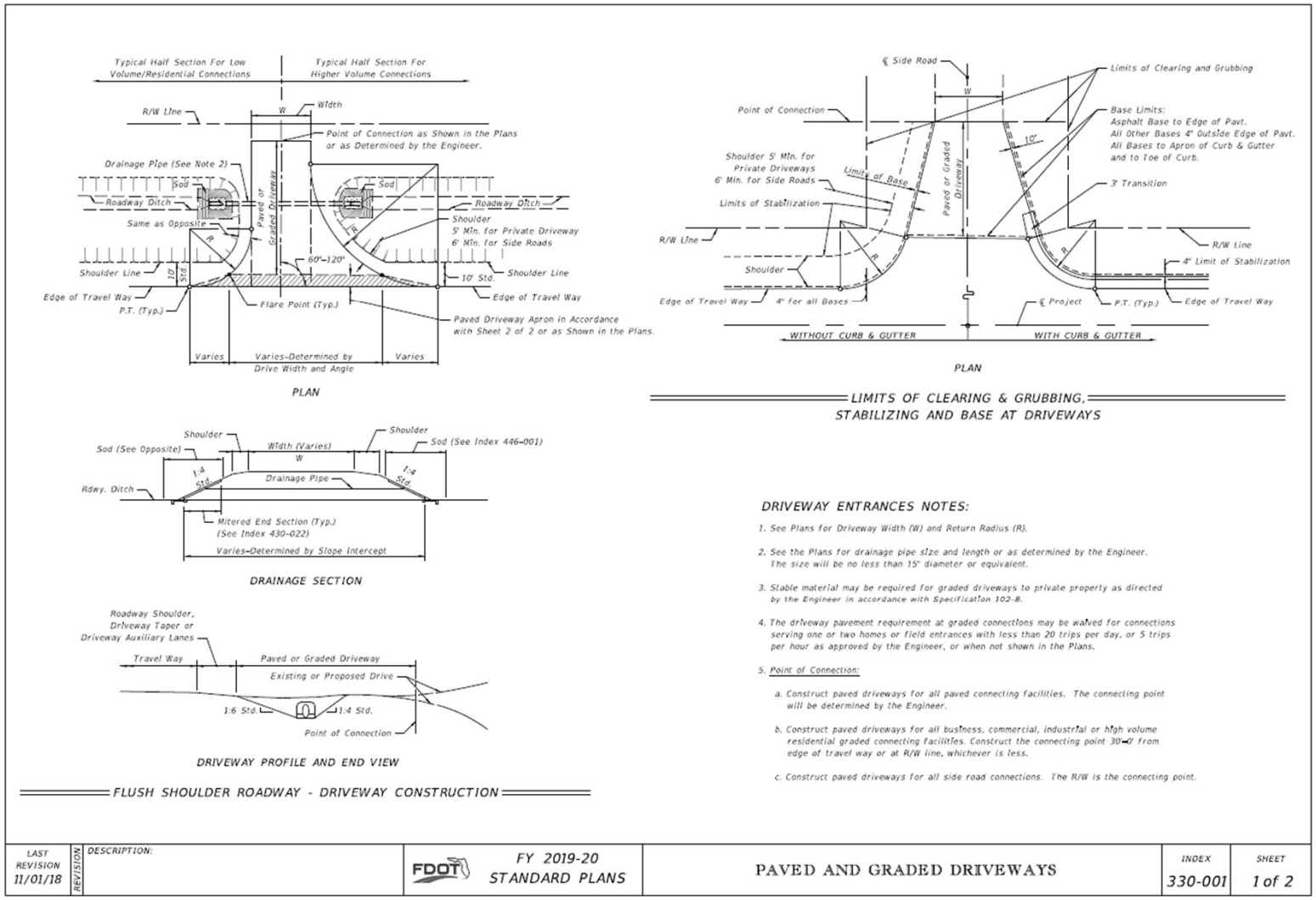
NEW - Paved and Graded Driveways, Index 330-001

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



NEW - Paved and Graded Driveways, Index 330-001

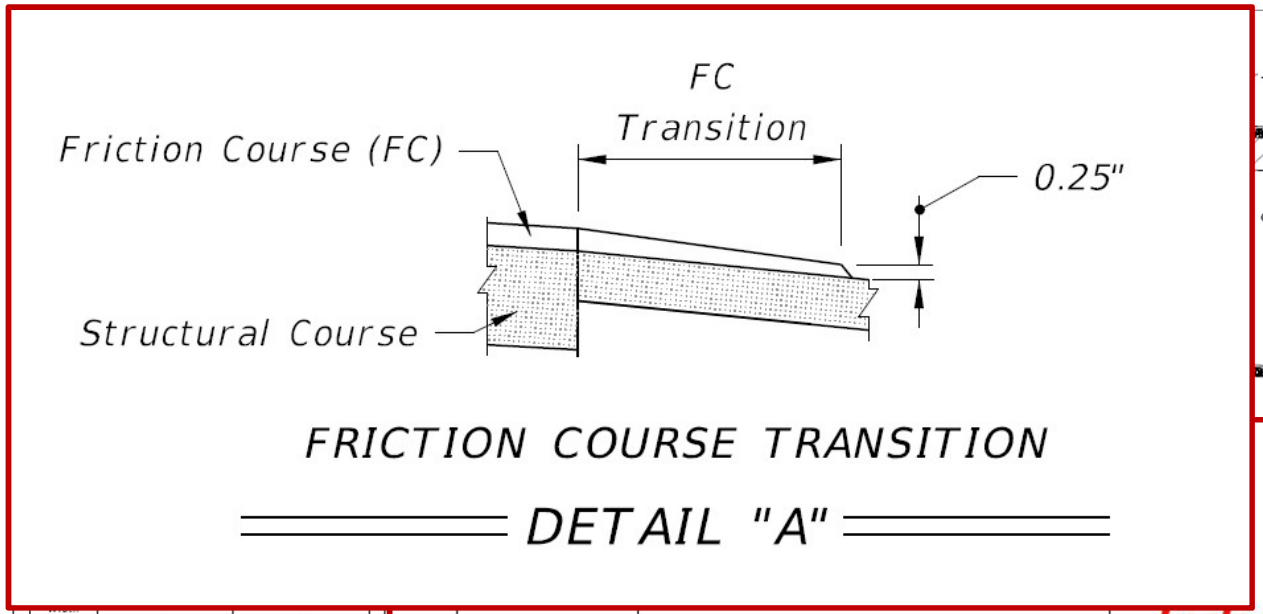
SHEET 2 of 2:

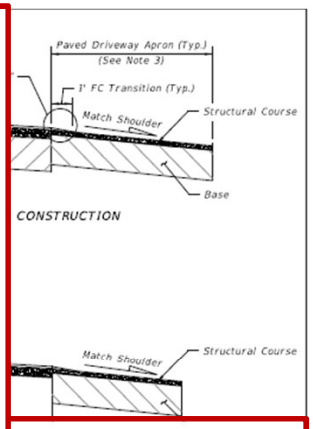
Construction Information from Old *Index 000-516*

Updated Material Requirements to Work for New Construction and Resurfacing Projects

Updated Cross-Sections

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

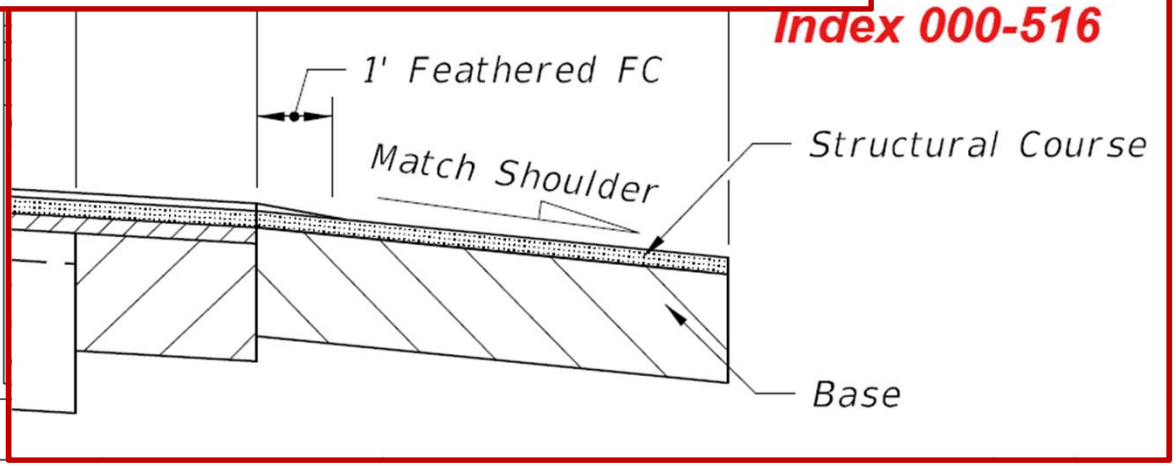




(Ft.)	Type I	Type II	Type I	Type II
12	26	51	31	60
14	27	52	33	61
16	28	53	34	63
18	29	54	35	64
20	31	55	37	65
22	32	56	38	67
24	33	57	39	68
26	34	58	40	69
28	35	59	42	70
30	36	61	43	72
32	37	62	44	73
34	38	63	46	74
36	39	64	47	76
38	41	65	48	77
40	42	66	49	78
42	43	67	51	79
44	44	68	52	81
46	45	69	53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

LAST REVISION 11/01/18 | REVISION | DESCRIPTION:

Old *Index 000-516*



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***

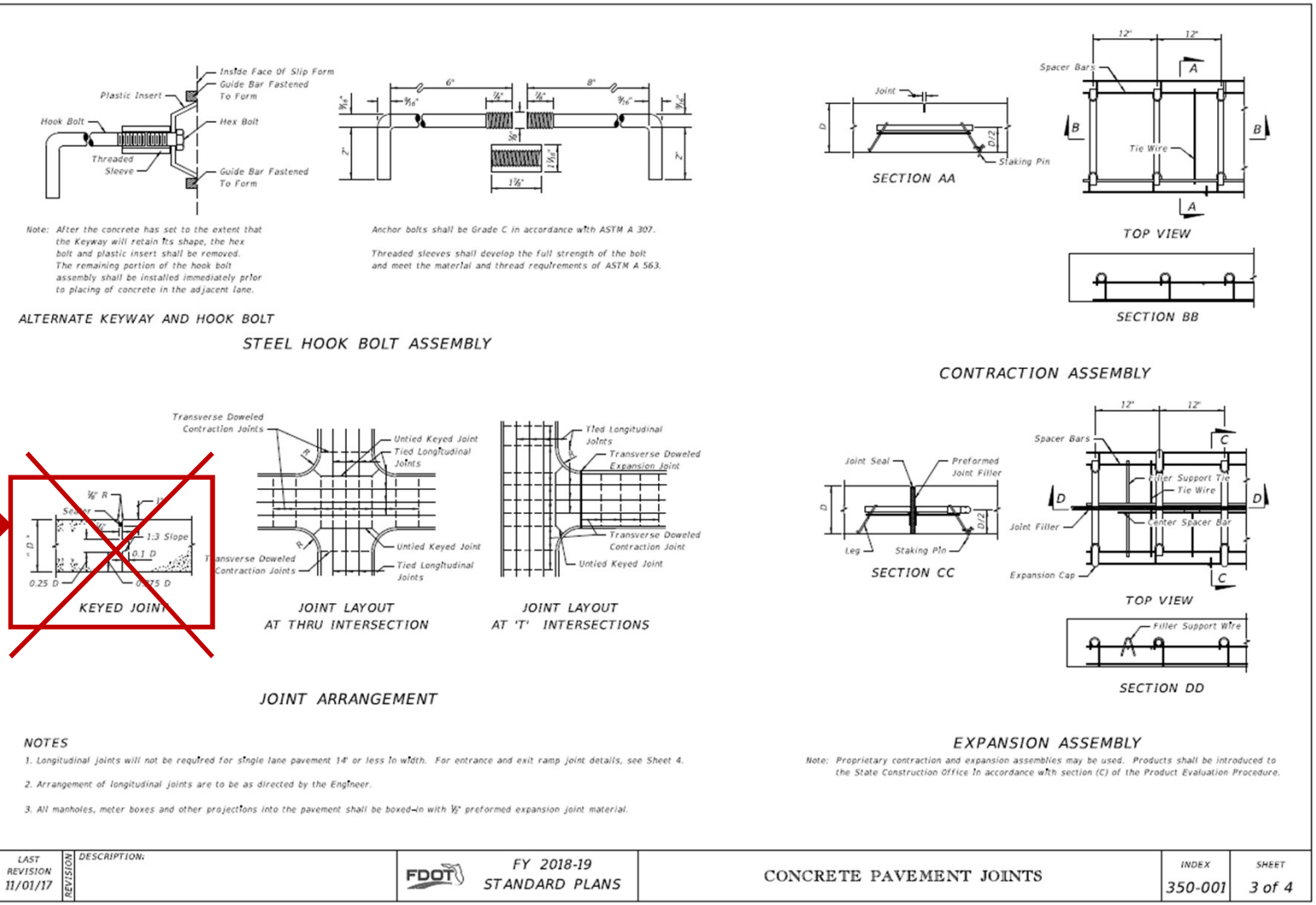
f) ***Index 522-001 - Concrete Sidewalk***

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***

Concrete Pavement Joints, Index 350-001

Deleted Keyed Joint



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*

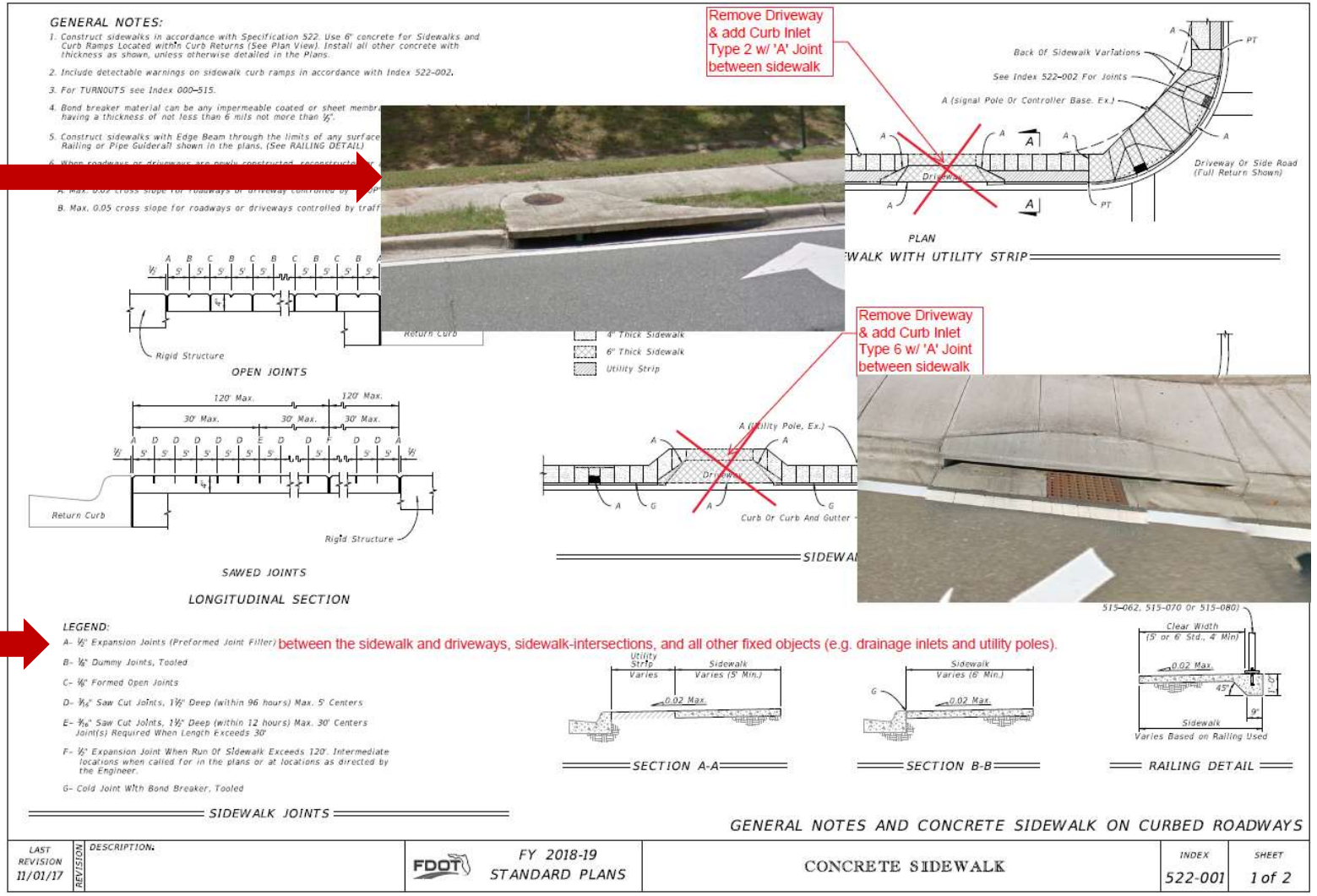
Concrete Sidewalk, Index 522-001

SHEET 1 of 2:

Added Curb Inlets to Examples

Clarified Intent of Expansion Joint Locations

Revised:
Specification 522

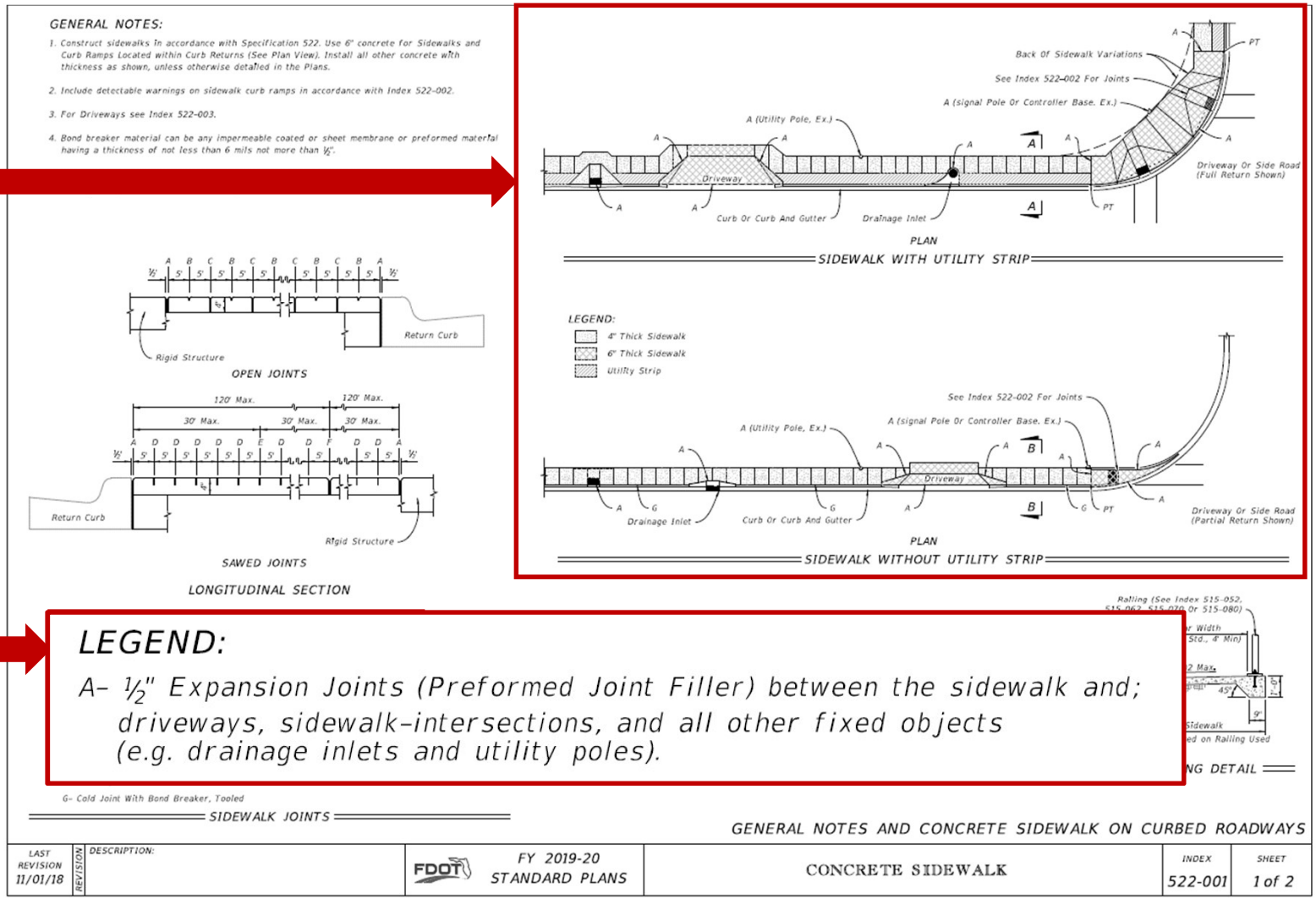


Concrete Sidewalk, Index 522-001

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 ½".

Back Of Sidewalk Variations
See Index 522-002 For Joints
A (signal Pole Or Controller Base, Ex.)
A (Utility Pole, Ex.)
Driveway
Curb Or Curb And Gutter
Drainage Inlet
Driveway Or Side Road (Full Return Shown)

PLAN

SIDEWALK WITH UTILITY STRIP

LEGEND:
4" Thick Sidewalk
6" Thick Sidewalk
Utility Strip

See Index 522-002 For Joints
A (Utility Pole, Ex.)
A (signal Pole Or Controller Base, Ex.)
Driveway
Drainage Inlet
Curb Or Curb And Gutter
Driveway Or Side Road (Partial Return Shown)

PLAN

SIDEWALK WITHOUT UTILITY STRIP

Return Curb
Rigid Structure

OPEN JOINTS

120' Max.
30' Max.

Return Curb
Rigid Structure

SAWED JOINTS

LONGITUDINAL SECTION

LEGEND:

A– ½" 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

SIDEWALK JOINTS

GENERAL NOTES AND CONCRETE SIDEWALK ON CURBED ROADWAYS

LAST REVISION 11/01/18	REVISION	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*

Detectable Warnings and Sidewalk Curb Ramps, Index 522-002

SHEET 1 of 8:

Updated Note 'C'

New Language

Old 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.

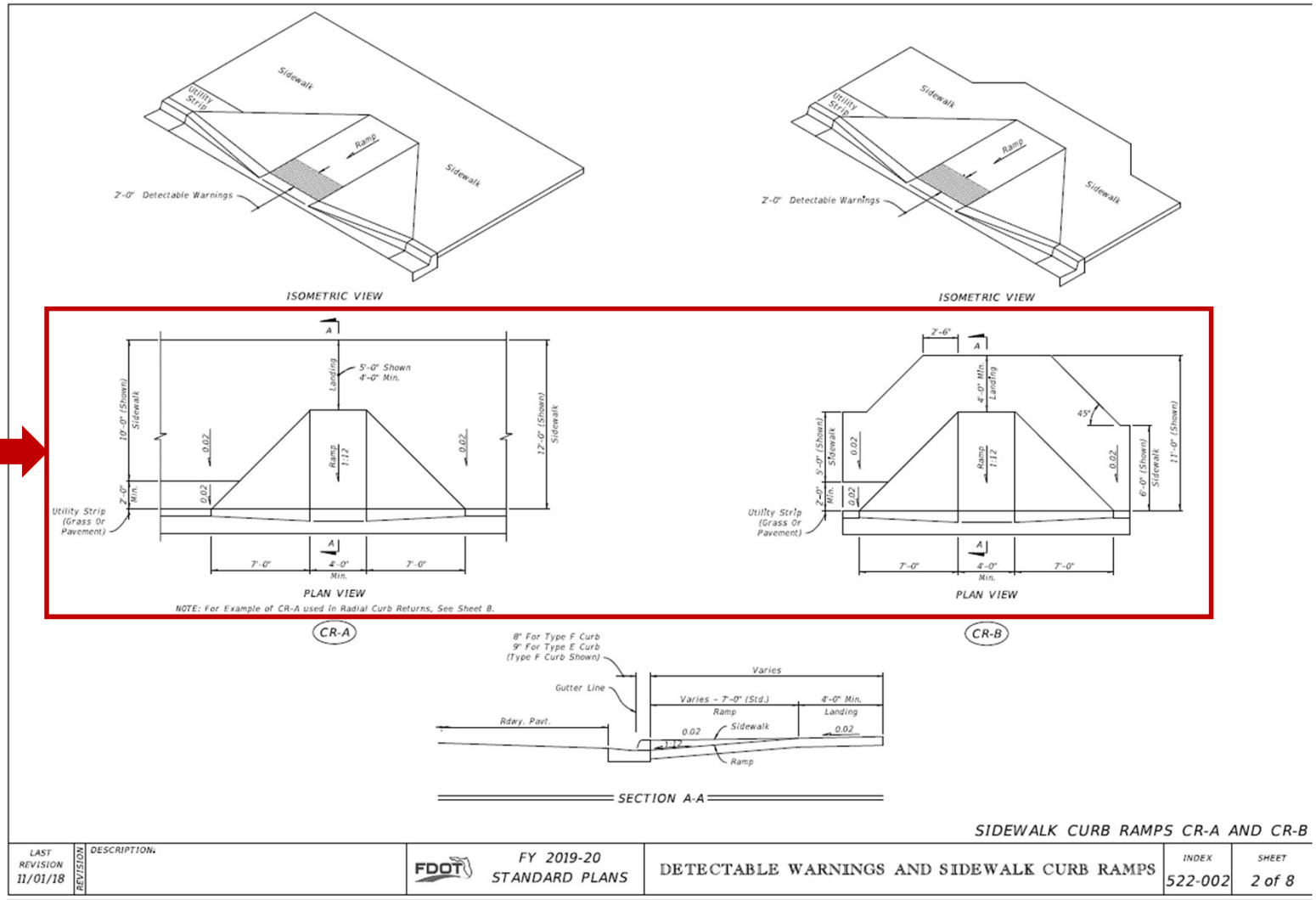
D. Joints permitted at the location of Slope Breaks. Otherwise locate joints in accordance with Index 522-001. No joints are permitted within the ramp portion of the Curb Ramp.

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

Detectable Warnings and Sidewalk Curb Ramps, Index 522-002

SHEET 2 of 8:

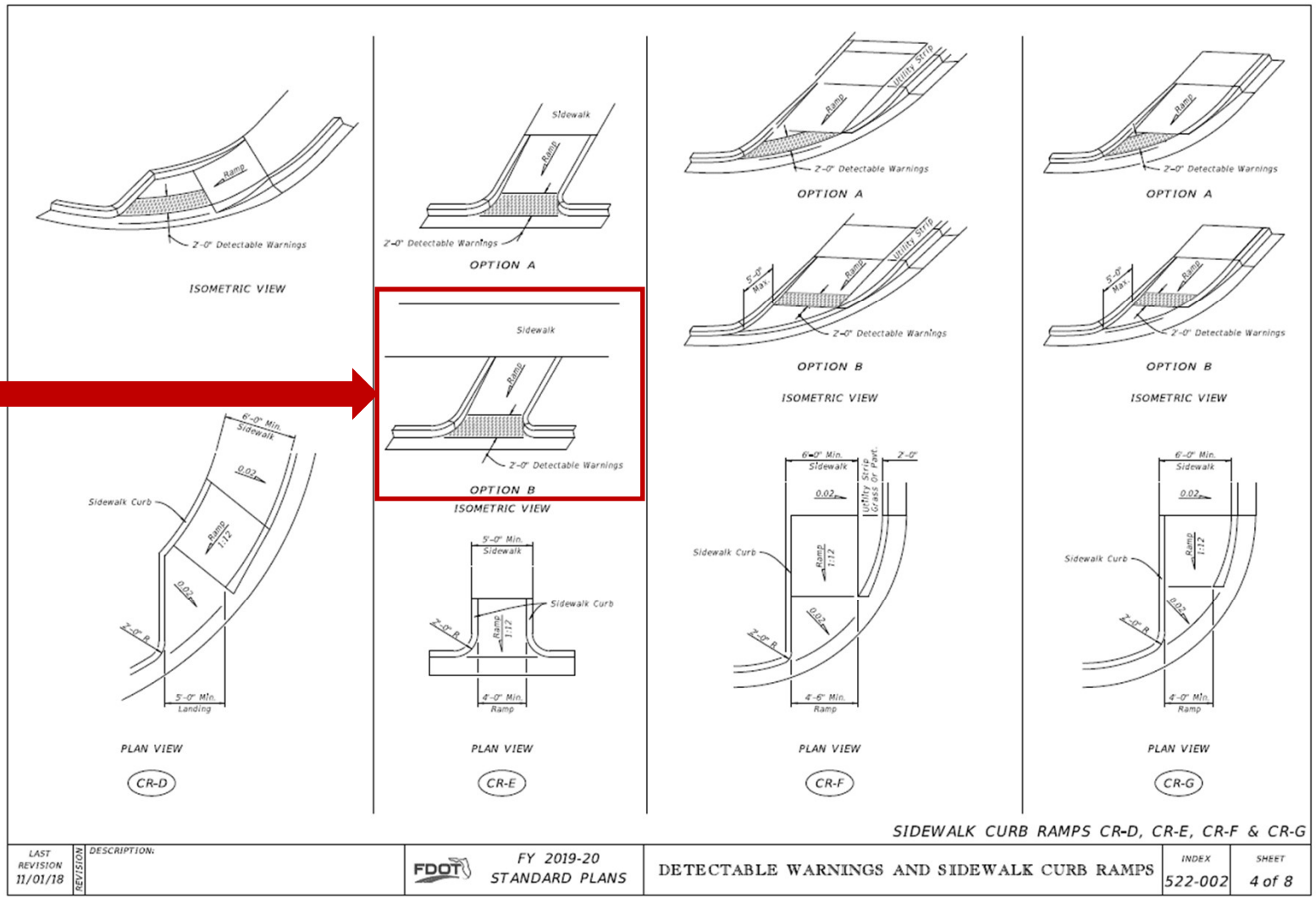
Updated CR-A and CR-B Plan View to Work With Current Sidewalk Width Requirements See FDM 222



Detectable Warnings and Sidewalk Curb Ramps, Index 522-002

SHEET 4 of 8:

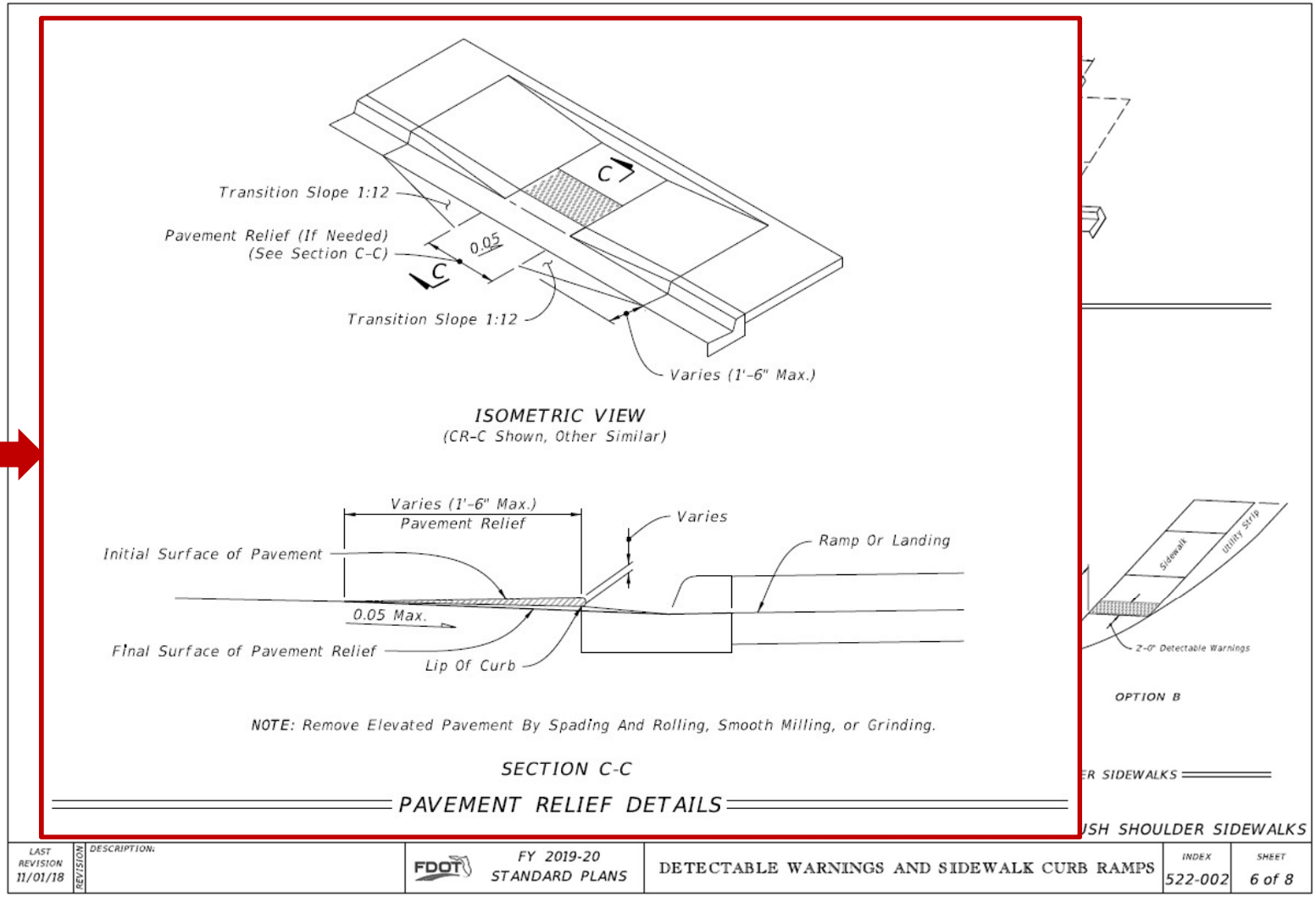
Added Option B for Parallel Sidewalk



Detectable Warnings and Sidewalk Curb Ramps, Index 522-002

SHEET 6 of 8:

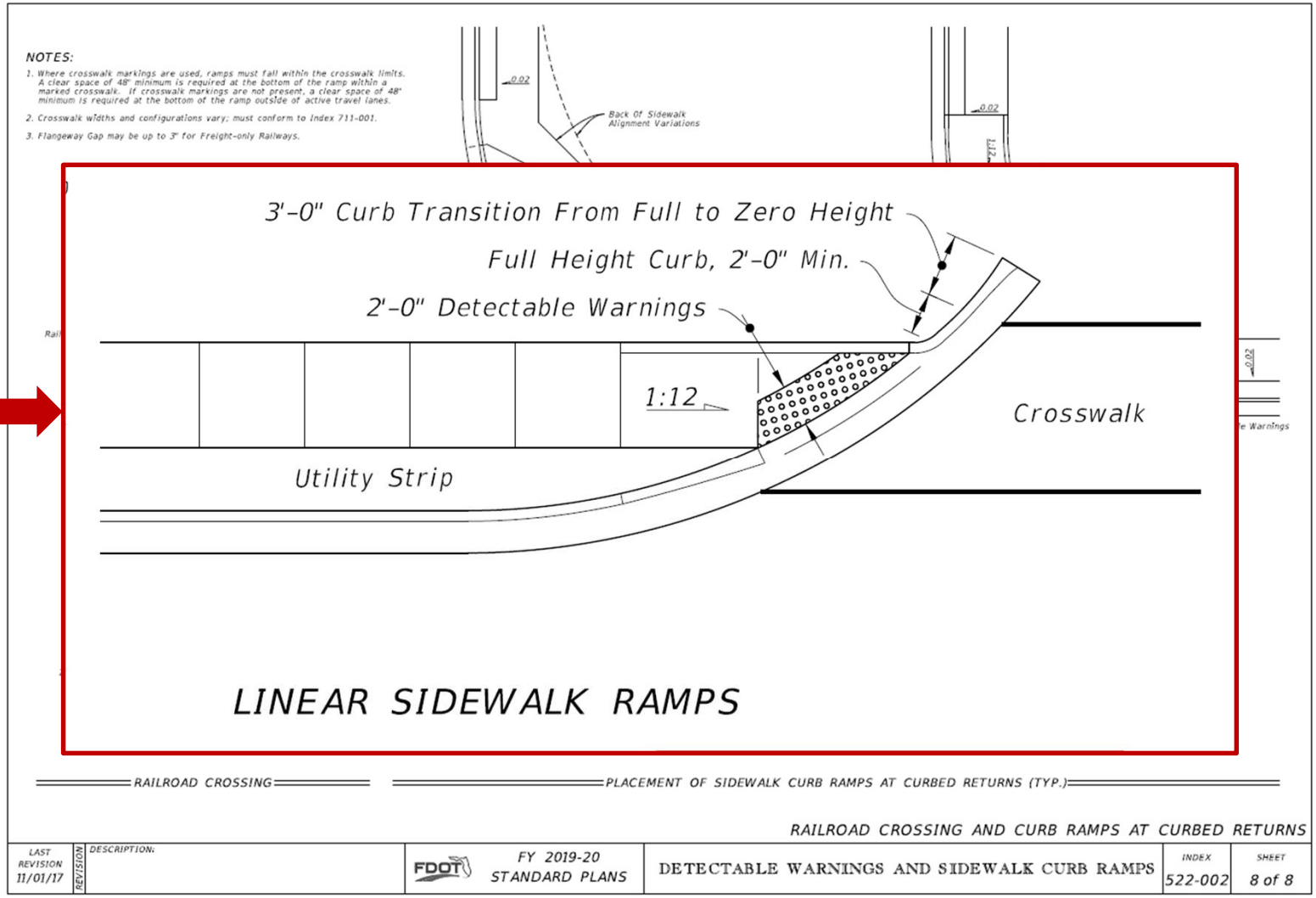
Re-Indexed 160-001: Stabilization Details



Detectable Warnings and Sidewalk Curb Ramps, Index 522-002

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*

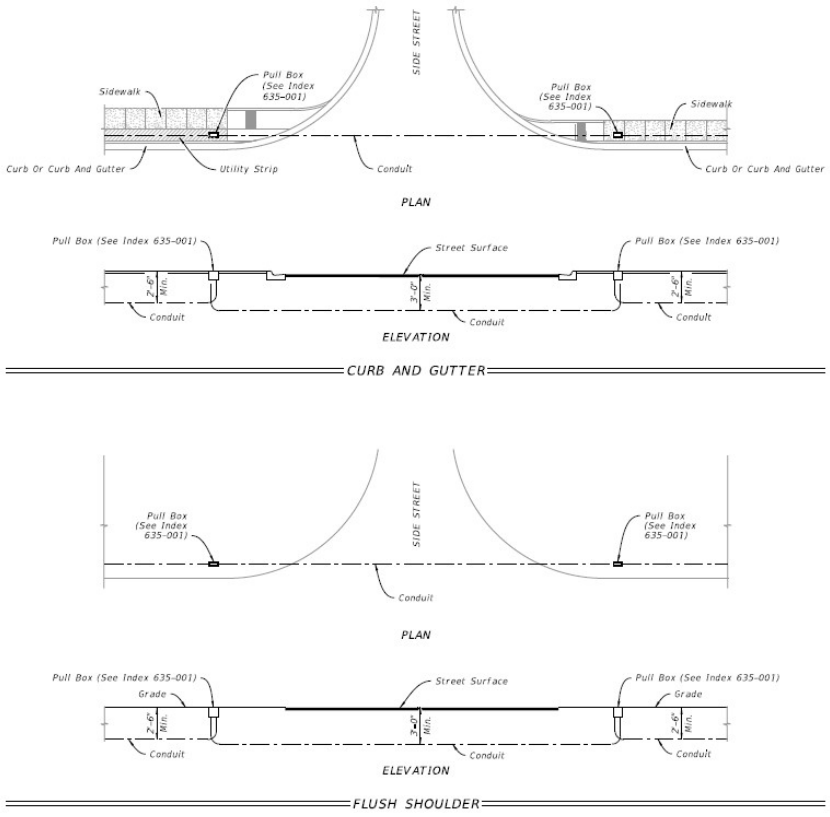
g) *Index 522-002 - Detectable Warnings and Sidewalk Curb Ramps*

h) *Misc. Traffic Control Signals and Devices (Including: Indexes 630-001, 634-002, 635-001, 659-010, 660-001, and 676-010*

Misc. Index 600 Series, Traffic Control Signals and Devices

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

INDEX 630-001

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"

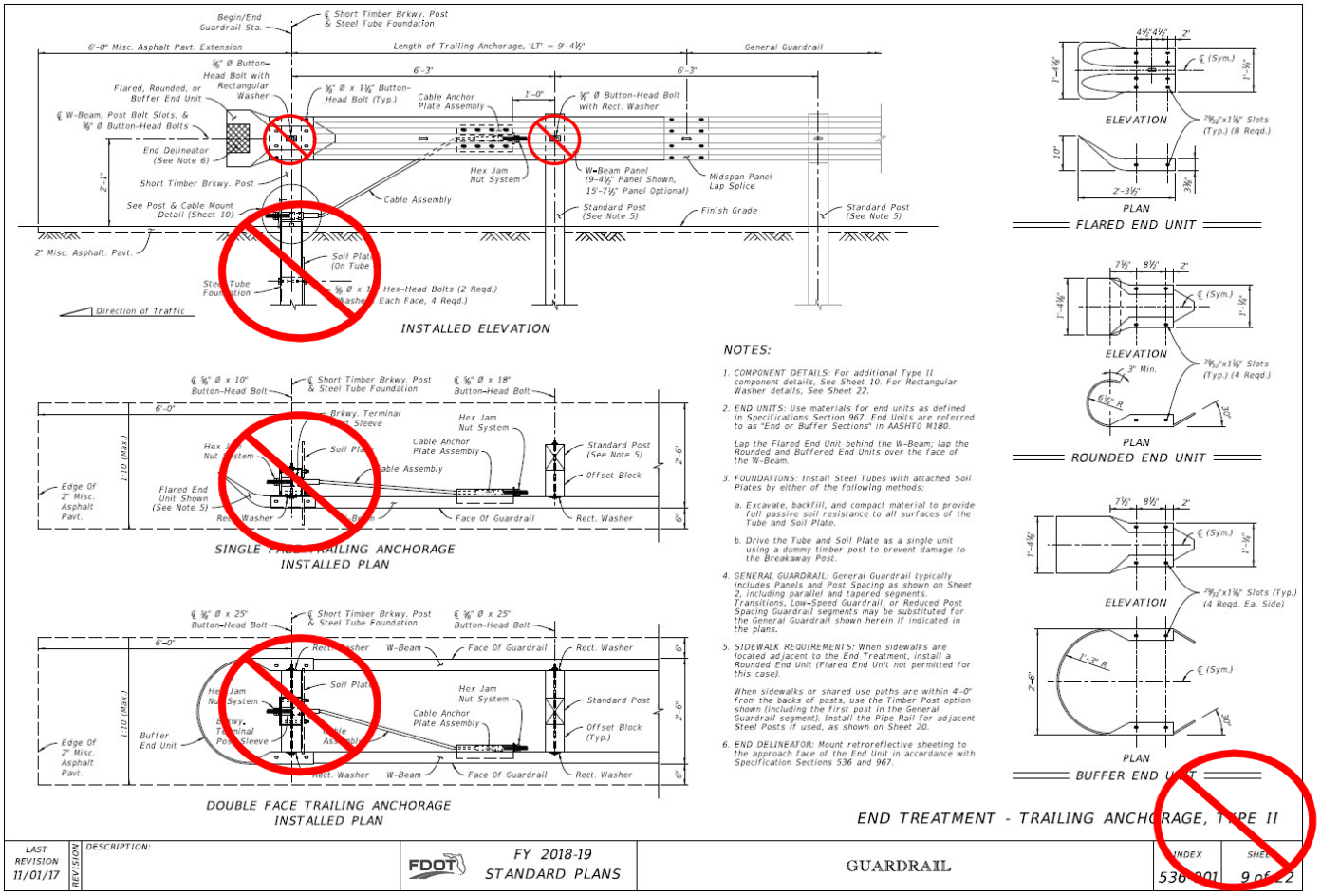
3) ***Index 521-010*** **– Opaque Visual Barrier (OVB)**
   - *Redeveloped* Index Sheets for Clarity
     - Durability Improvements
     - Varying Barrier Heights
   - *New* SPI and FDM Section

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:

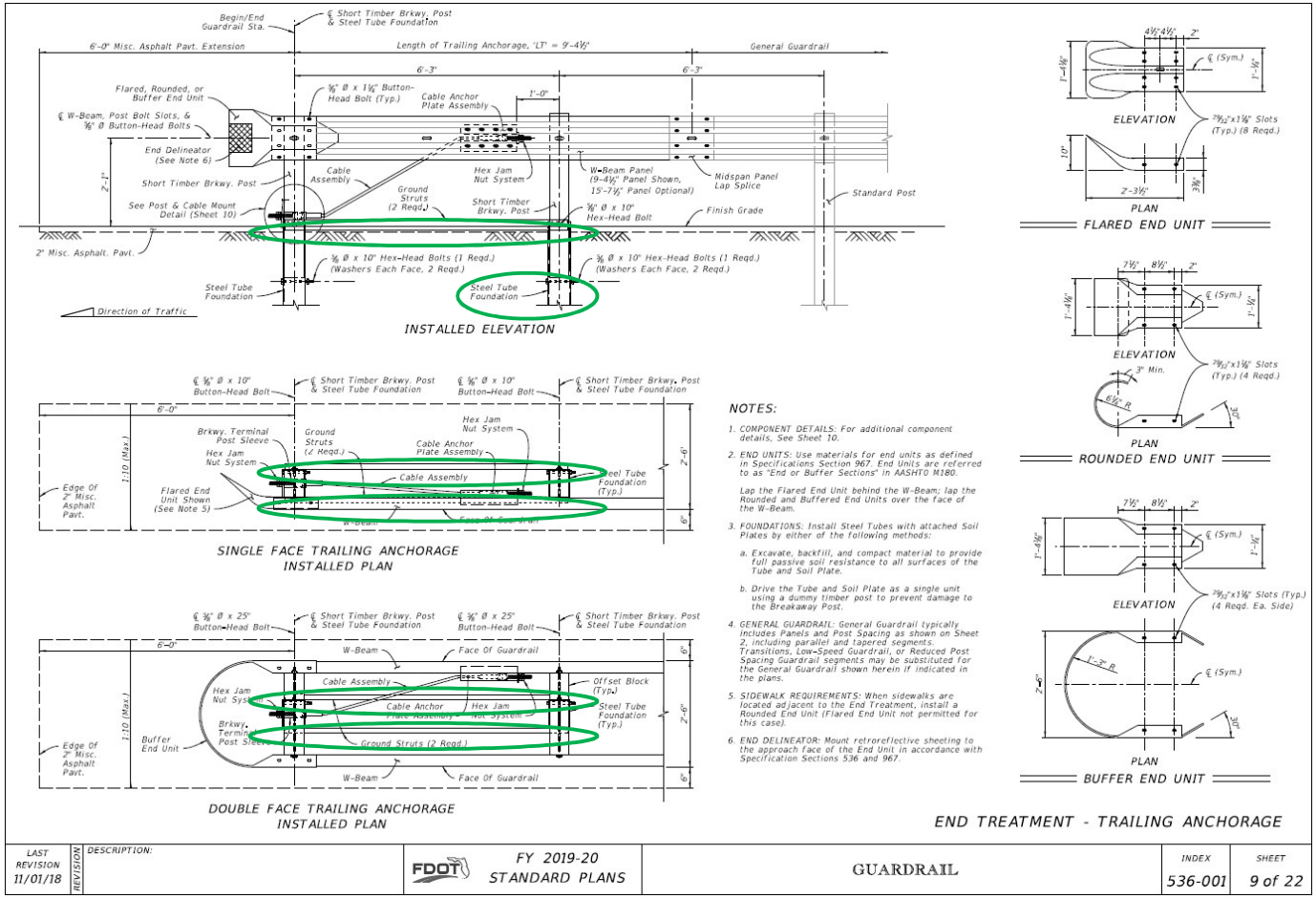
1) ***Index 536-001*** **– Guardrail**
   - *New* "Trailing Anchorage"
     - Updated Downstream Placement Policy

Sheet 9: No More "Type II"!



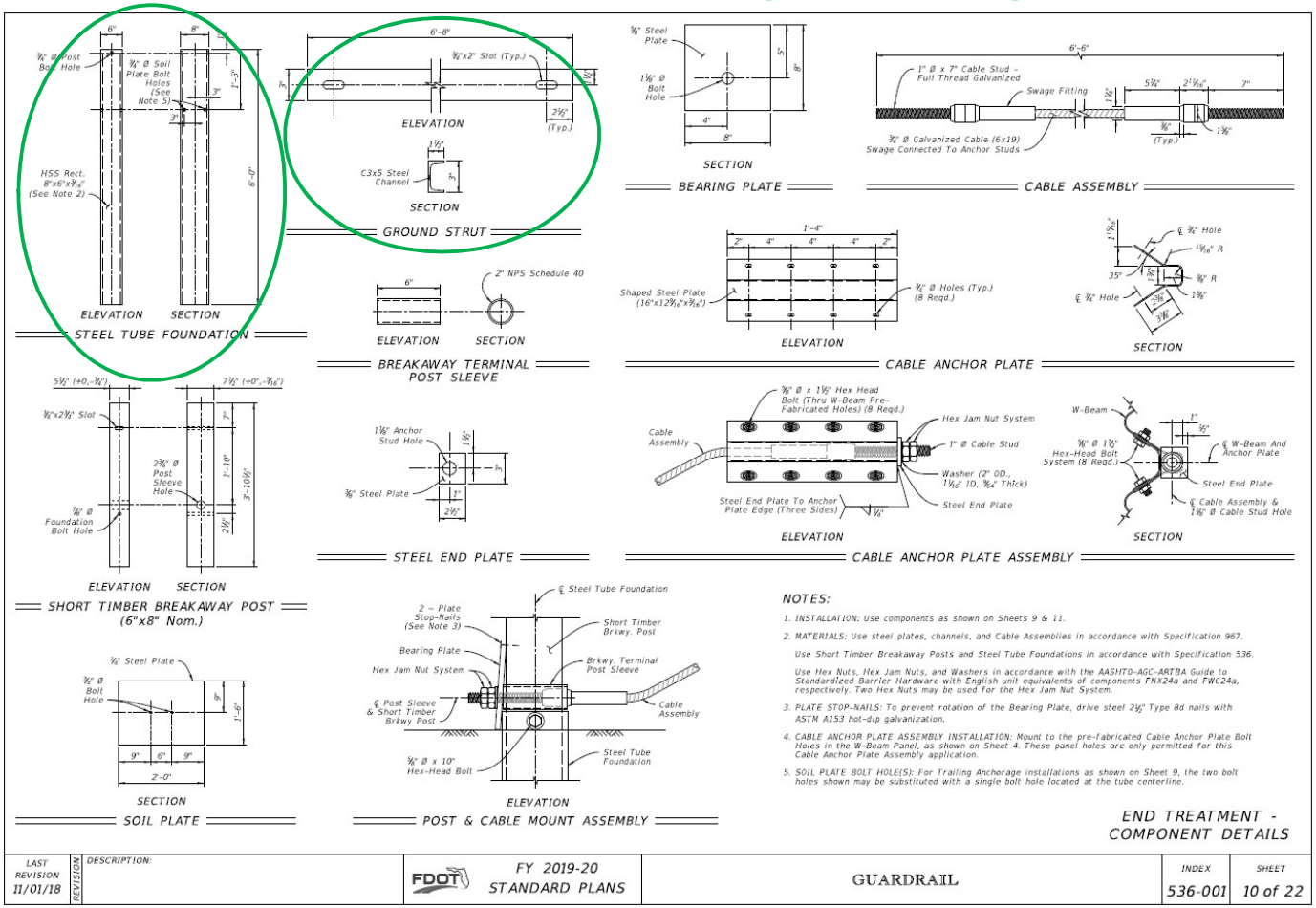
- Soil Plate System Removed
- Rectangular Washers Removed

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

Sheet 10: *New* Trailing Anchorage!



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

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=29 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

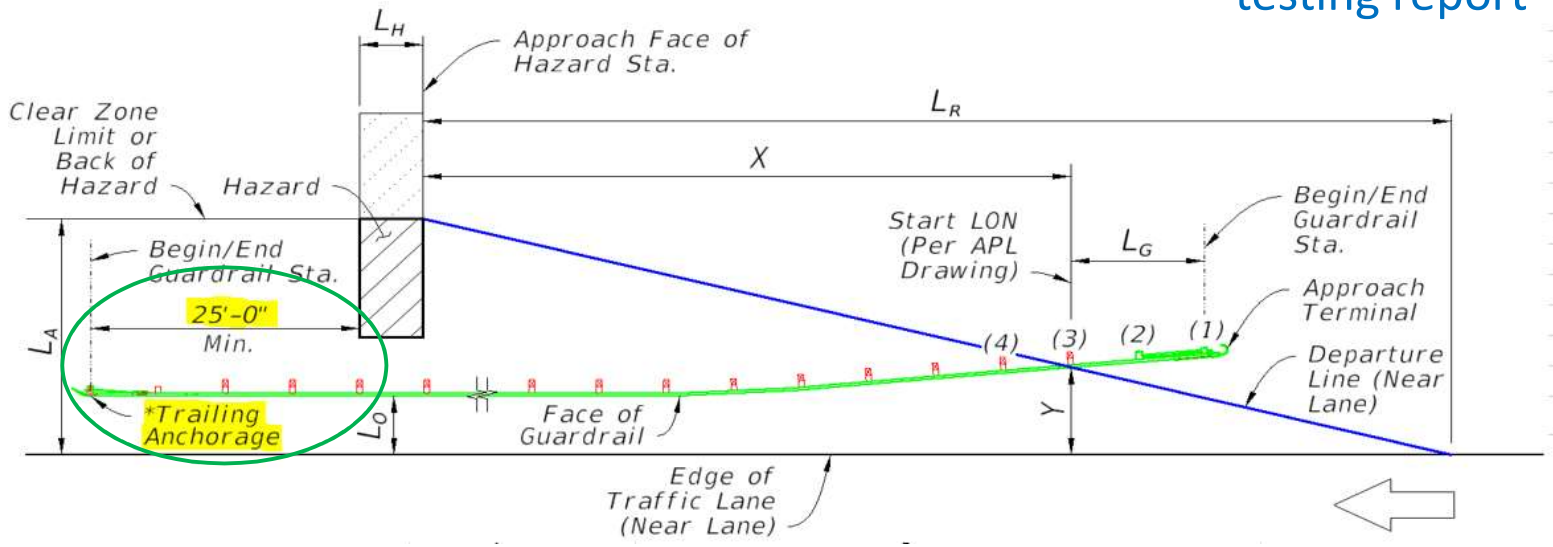
SPI, Part C: *New* Trailing Anchorage!

Standard Plans Instructions — Topic No. 625-010-003
Index 536-001 Guardrail — 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.



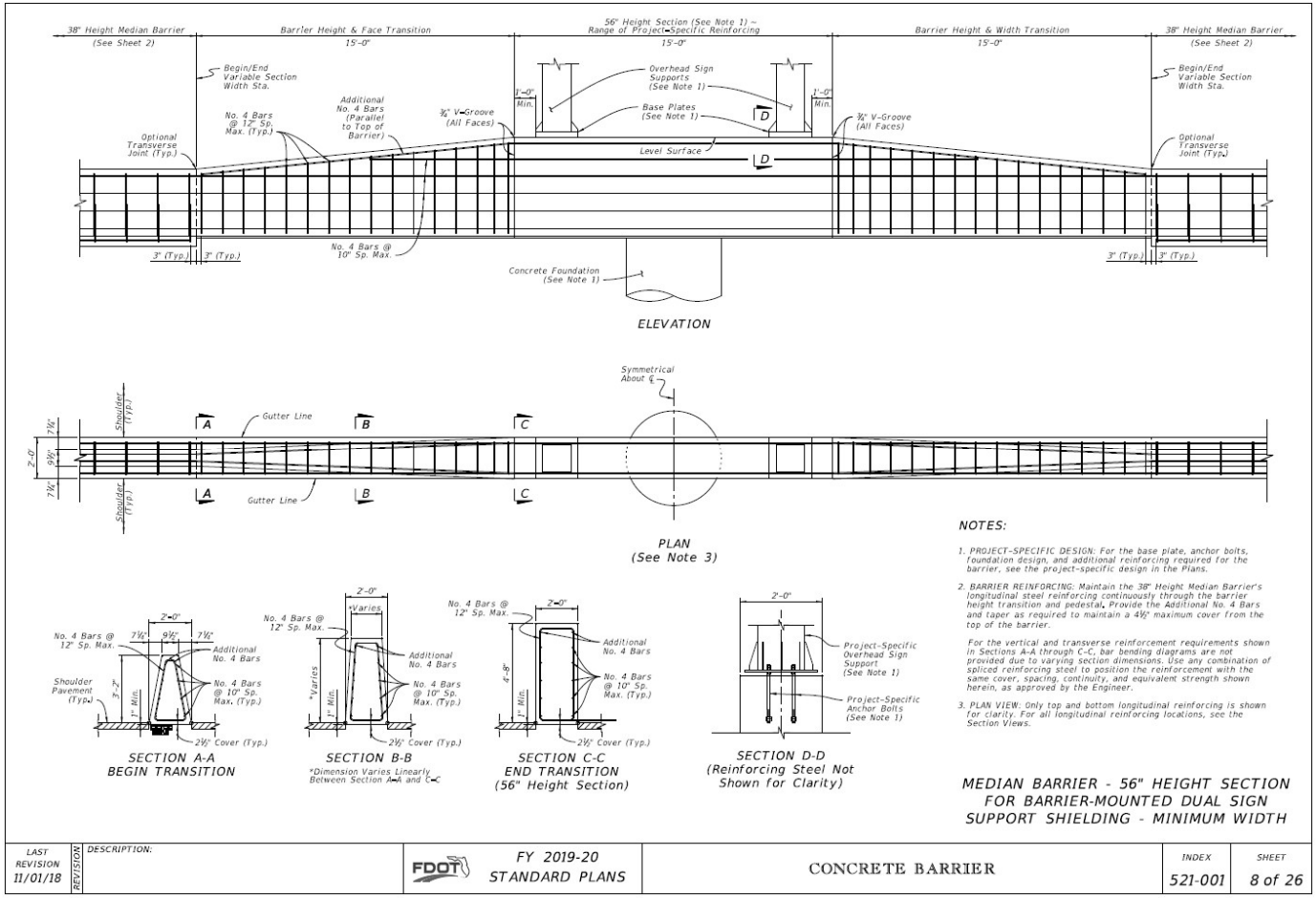
- Extend Trailing Anchorage to **25 feet** downstream of hazard being shielded
- Based on latest MASH crash testing report

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

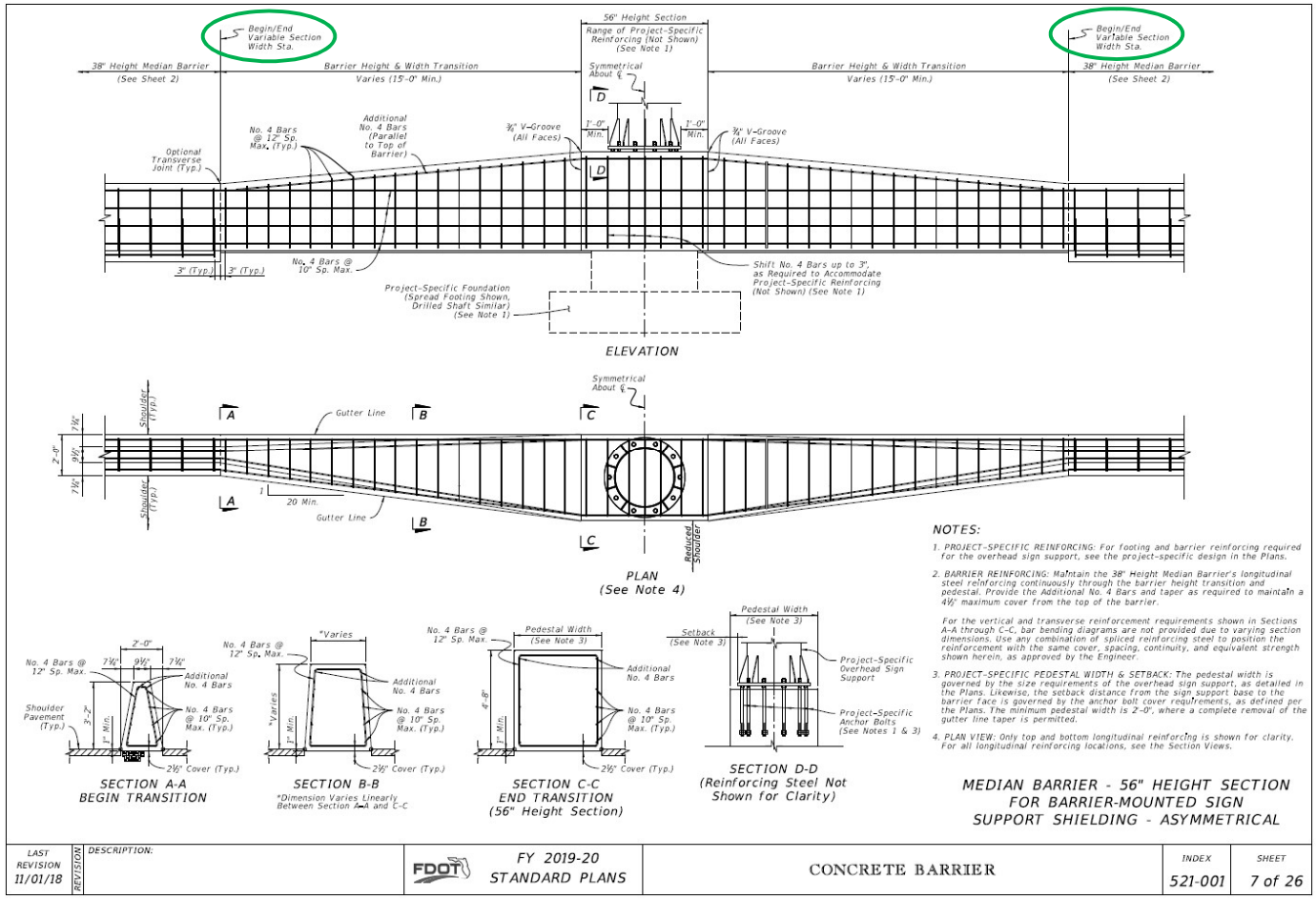
****

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

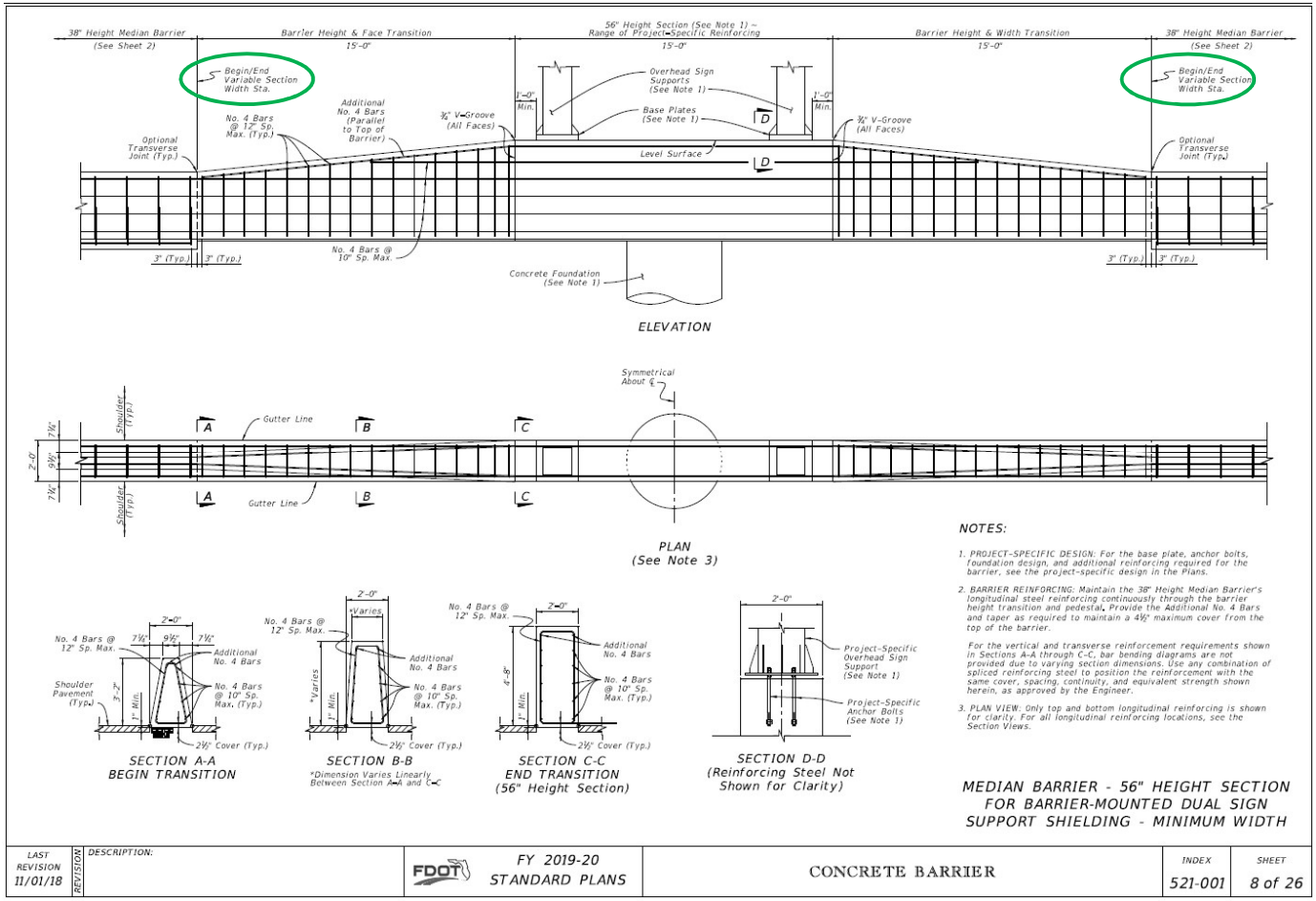
- **New Pay Item** for single-faced Wall Shielding Barrier
- Shoulder Concrete Barrier **521-72-61** is for ***single-faced*** application

Sheet 7: Variable Section Width Callouts



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

Sheet 8: Variable Section Width Callouts

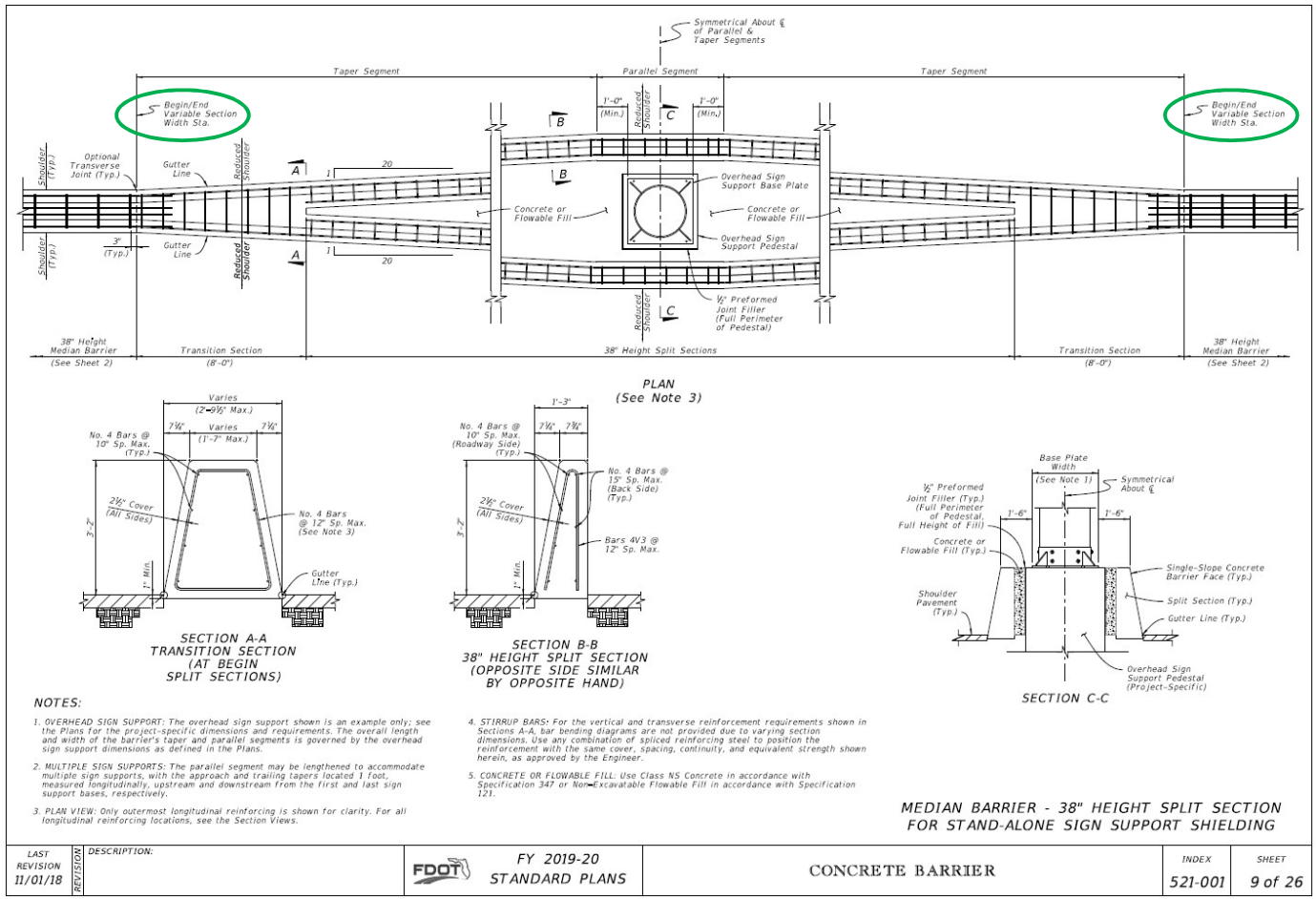


- *Example* of… Variable Section Width Pay Item (Double-Faced)

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

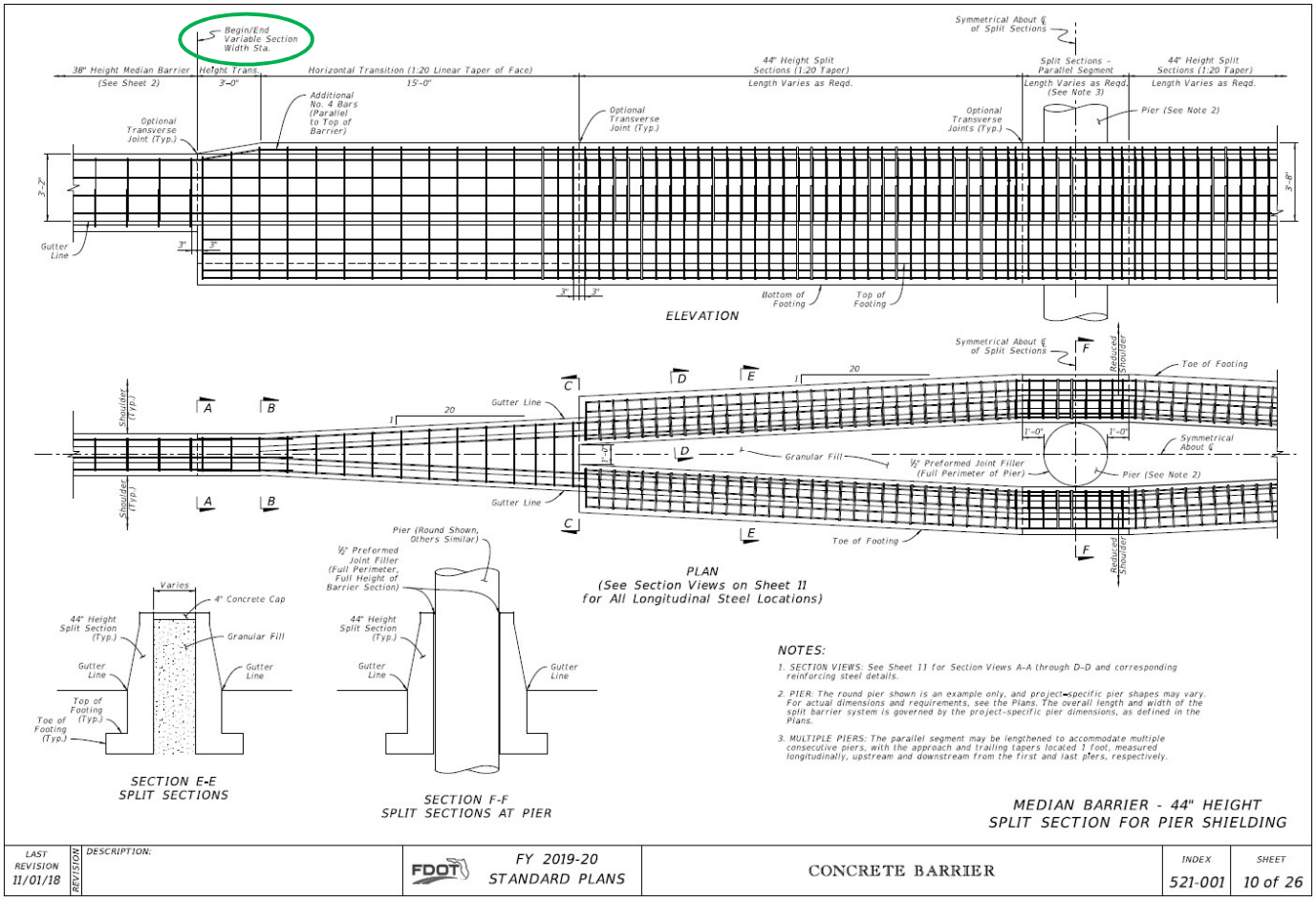


- *Example* of… Variable Section Width Pay Item (Double-Faced)

NOTE:

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

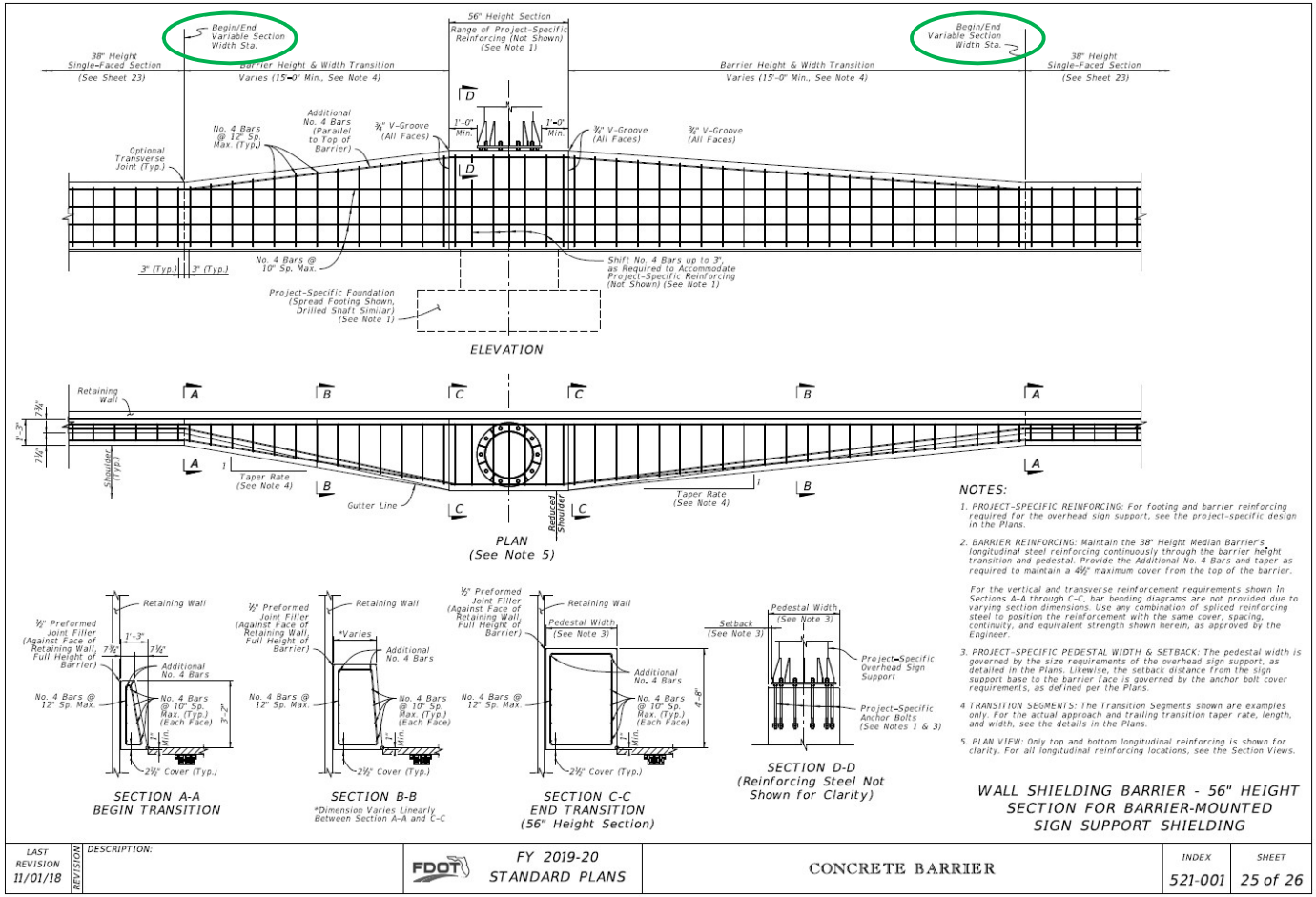
Sheet 10: Variable Section Width Callouts



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

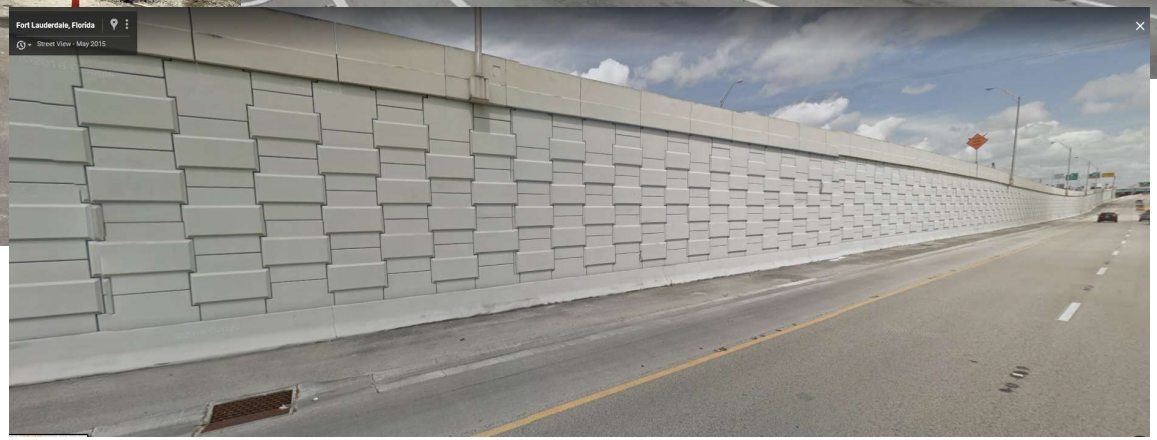
NOTE:
Measurement is along centerline of entire Variable Section Width system per the SPI and Specifications.

Sheet 25: Variable Section Width Callouts

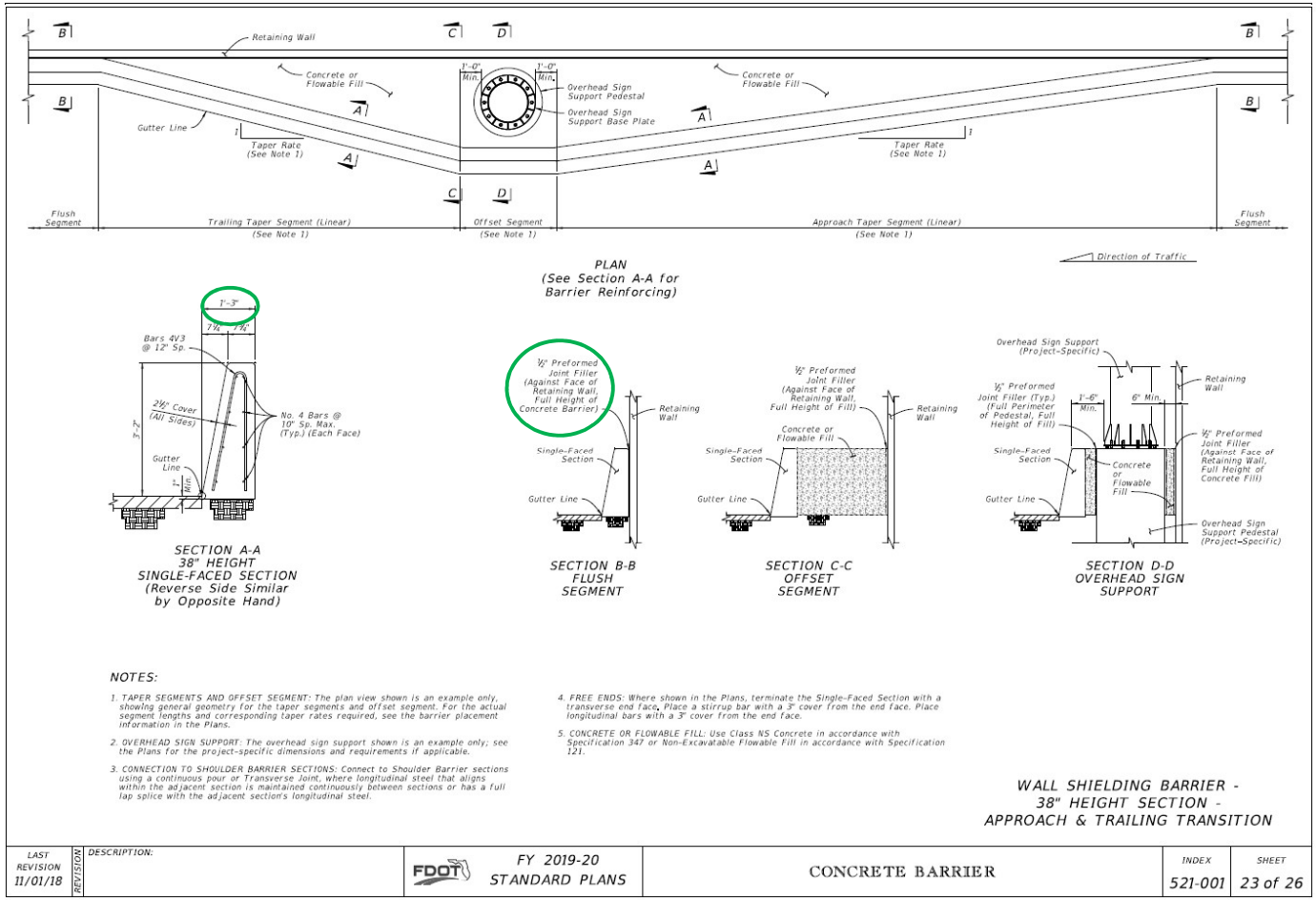


- *Example* of… Variable Section Width Pay Item (Single-Faced)
- Sneak Peak of *Wall Shielding Barrier*

Wall Shielding Barrier – Past Examples (Non-Standard)

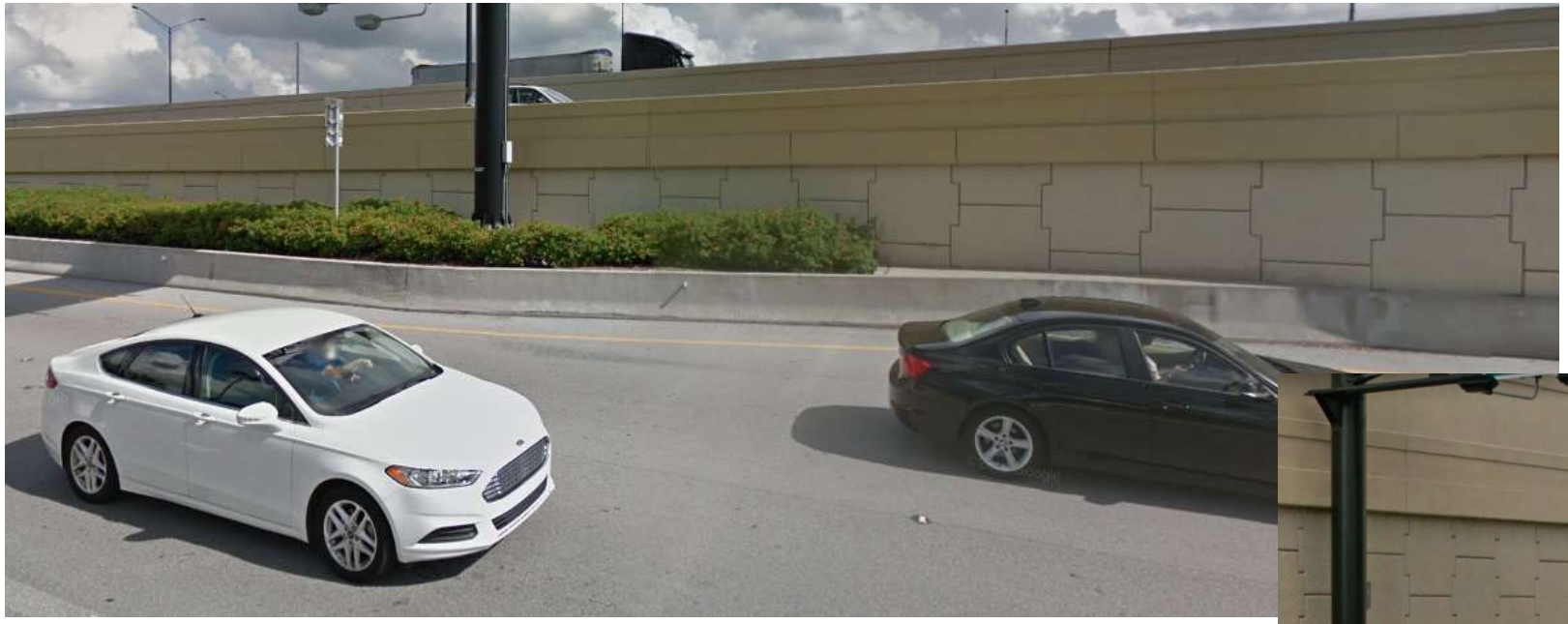


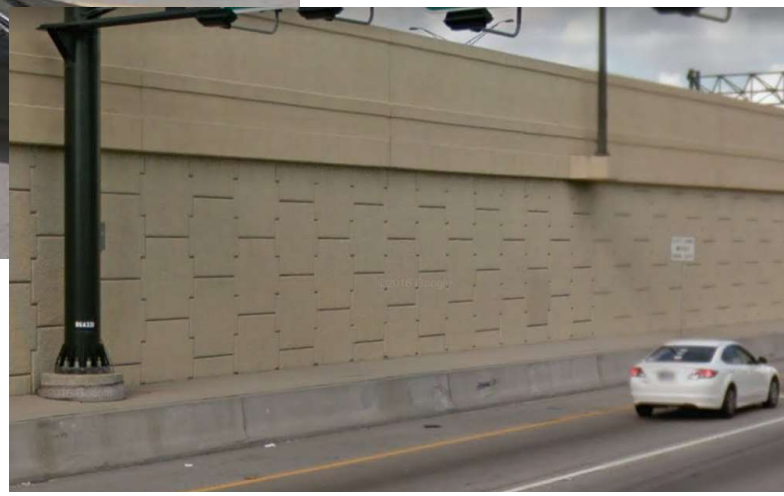
Sheet 23: Wall Shielding Barrier – Approach & Trailing Taper



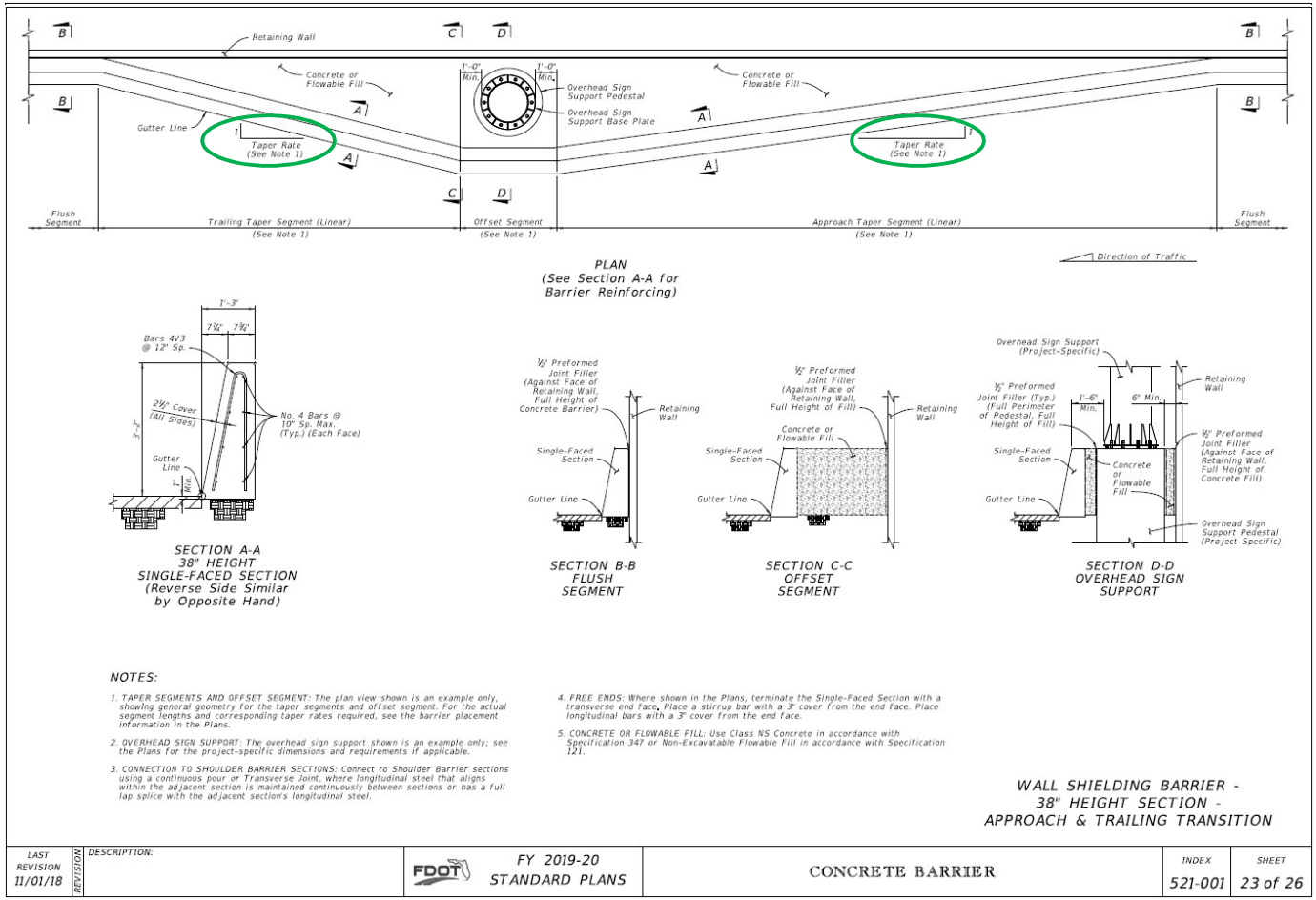
- **Usage:** Decision is project-specific per the SPI, Part B (District-level decision)
- **Space Needed:** Requires 1’-3½” from retaining wall to gutter line (Barrier Section plus half-inch joint filler)

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





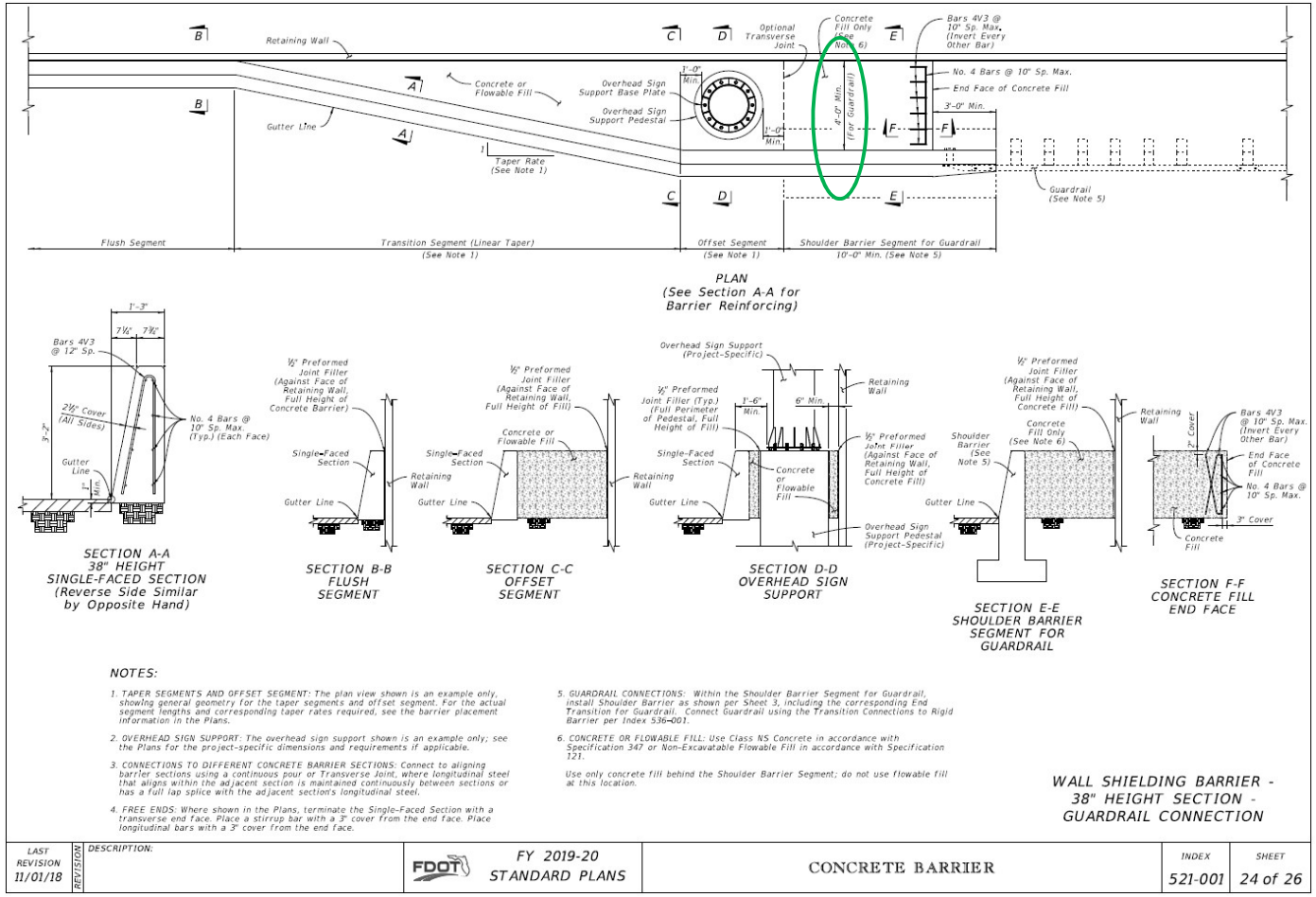
Sheet 23: Wall Shielding Barrier – Approach & Trailing Taper



- **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)

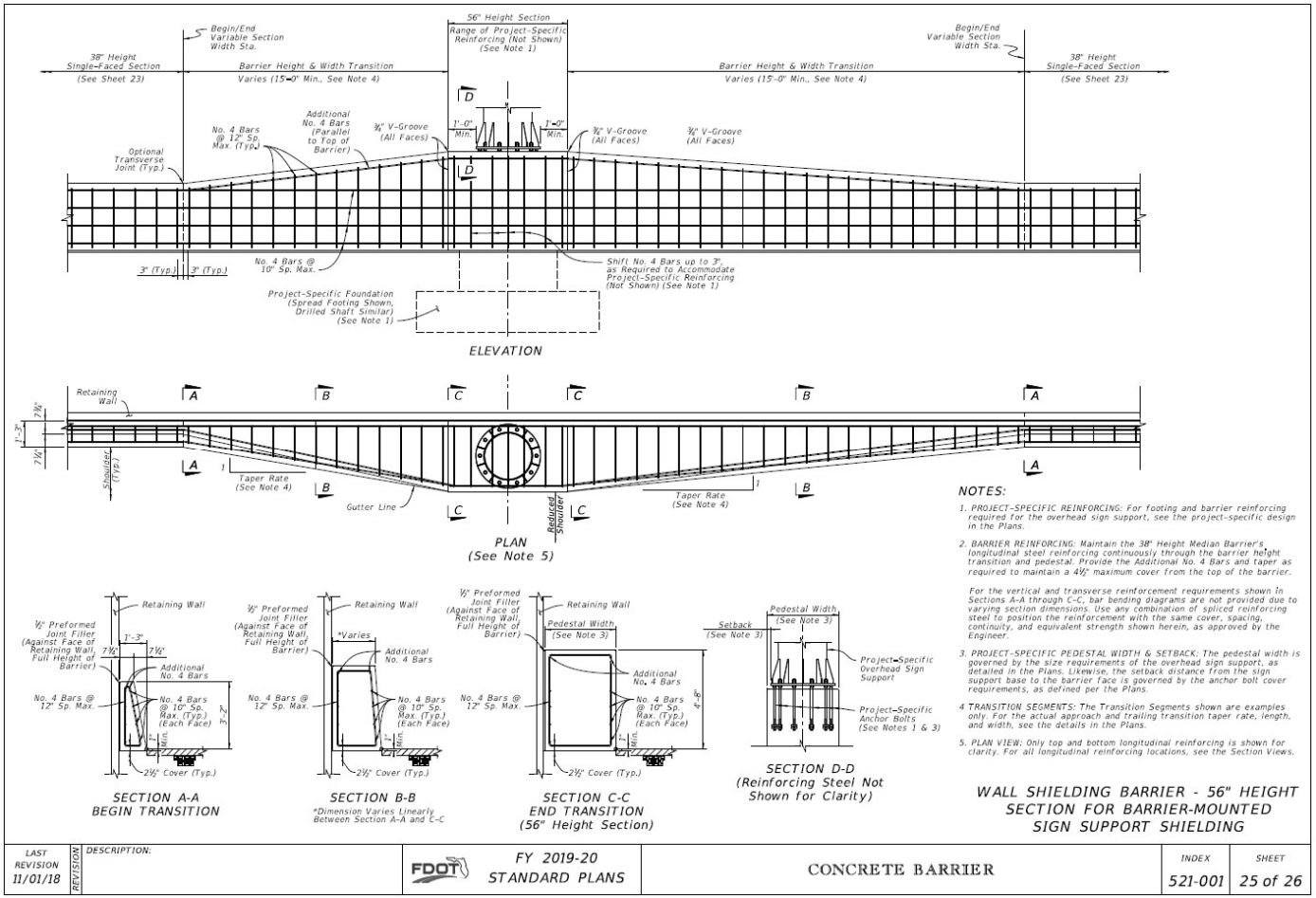
Wall Shielding Barrier – Past Examples (Non-Standard)
Guardrail Connection

Sheet 24: Wall Shielding Barrier – Guardrail Connection



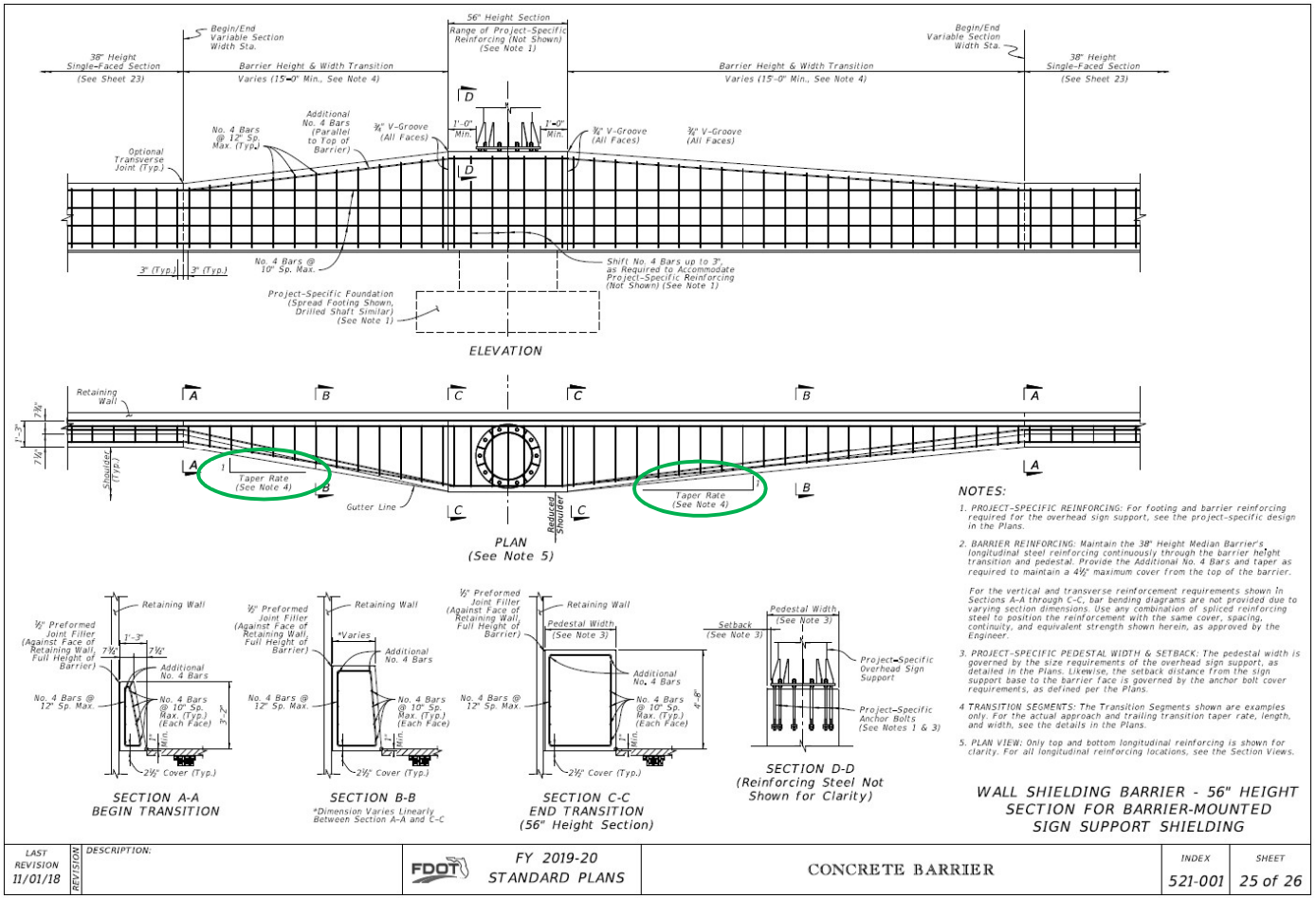
- **Space Needed:** Requires 5’-3½” from retaining wall to gutter line (for proper Guardrail setback)
- **Overhead Sign Support:** Project-specific design, similar to median version, (Sheets 9-10)

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
Shoulder Barrier, Curb & Gutter Barrier, and Wall Shielding Barrier	70	1:20	1:5
	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

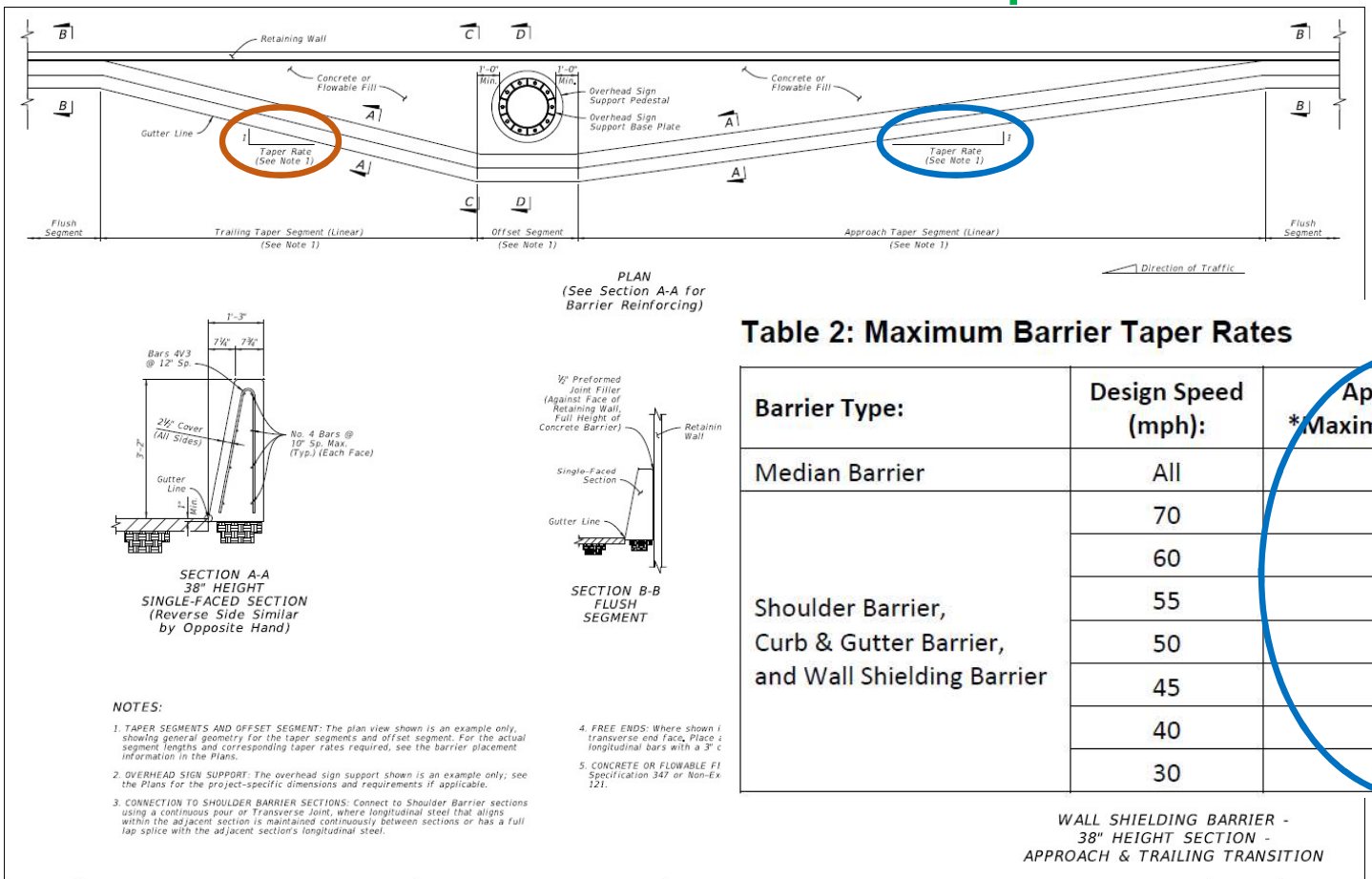


Table 2: Maximum Barrier Taper Rates

Barrier Type:	Design Speed (mph):	Approach End *Maximum Taper Rate:	Trailing End *Maximum Taper Rate
Median Barrier	All	1:20	1:20
Shoulder Barrier, Curb & Gutter Barrier, and Wall Shielding Barrier	70	1:20	1:5
	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 Example** – Wall Shielding Barrier

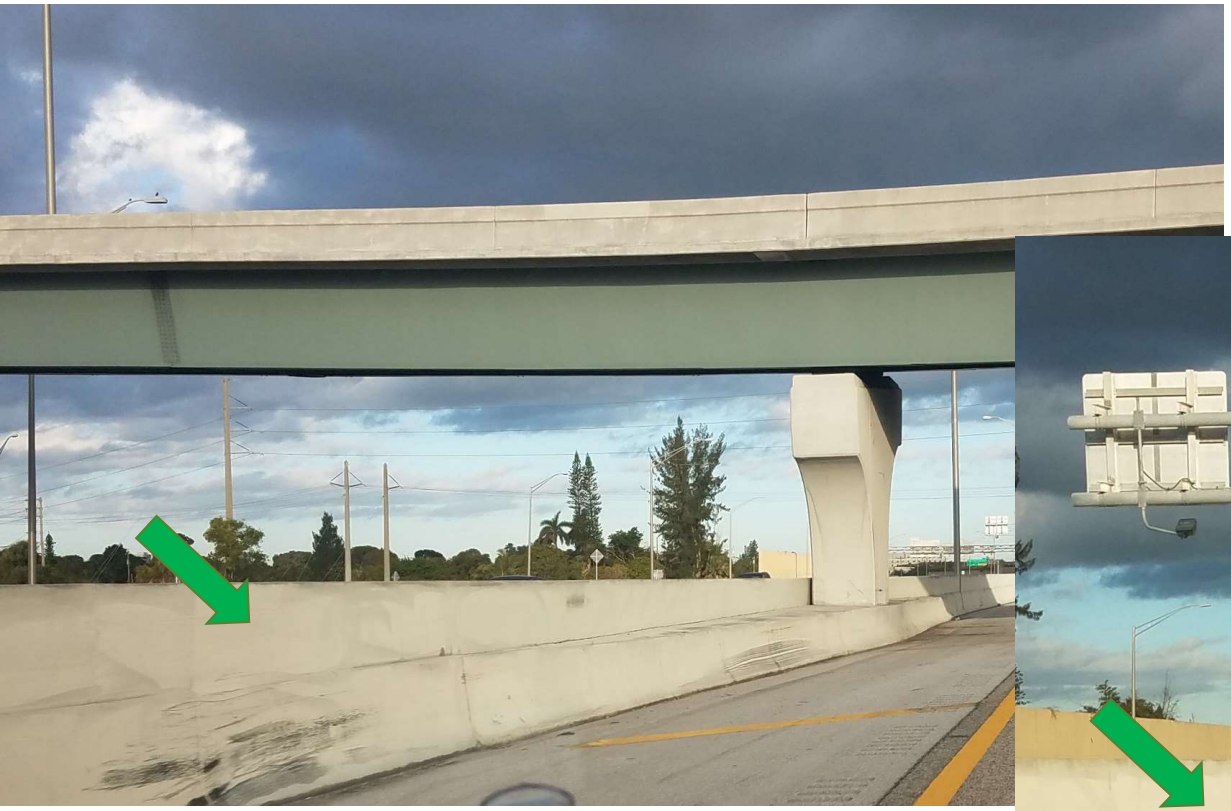
Standard Plans – Primary Index Updates:

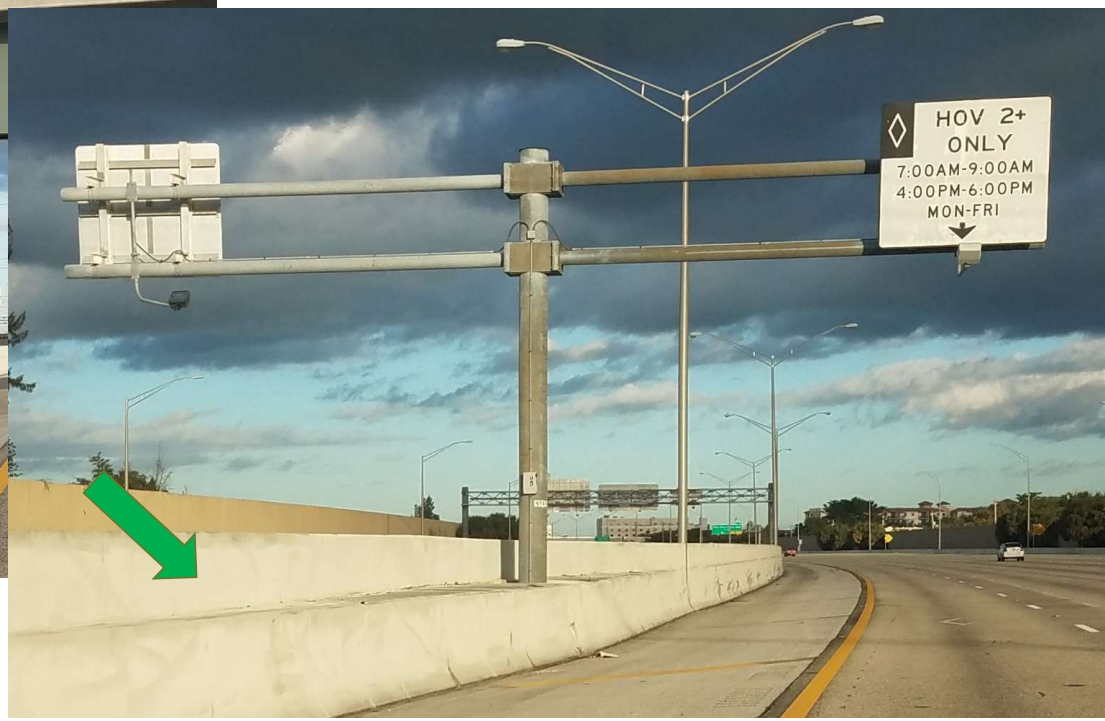
✓ **1) *Index 536-001* – Guardrail**
- *New* "Trailing Anchorage"
  - Updated Downstream Placement Policy

✓ **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

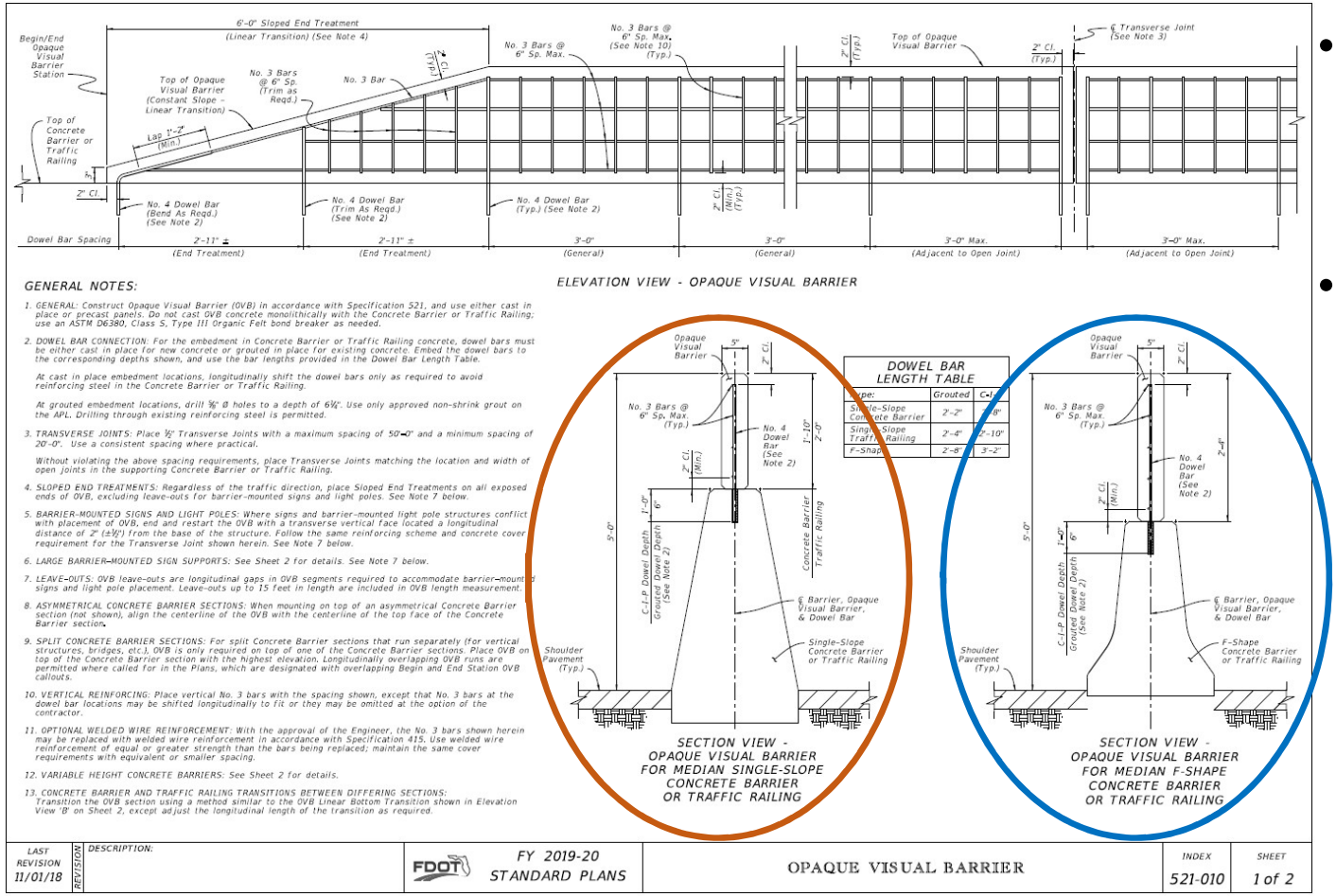
Opaque Visual Barrier is used on top of median concrete barrier and traffic railing to reduce headlight glare from opposing traffic lanes. Opaque Visual Barrier may be considered on LA Facilities that have glare issues when the facility has high-traffic volumes and a separation between opposing traffic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



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.

   At cast in place embedment locations, longitudinally shift the dowel bars only as required to avoid reinforcing steel in the Concrete Barrier or Traffic Railing.

   At grouted embedment locations, drill ⅝" Ø holes to a depth of 6½". Use only approved non-shrink grout on the APL. Drilling through existing reinforcing steel is permitted.
3. TRANSVERSE JOINTS: Place ½" Transverse Joints with a maximum spacing of 50'-0" and a minimum spacing of 20'-0". Use a consistent spacing where practical.

   Without violating the above spacing requirements, place Transverse Joints matching the location and width of open joints in the supporting Concrete Barrier or Traffic Railing.
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" (±½") 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-I-P
Single-Slope Concrete Barrier	2'-2"	2'-0"
Single-Slope Traffic Railing	2'-4"	2'-10"
F-Shape	2'-8"	3'-2"

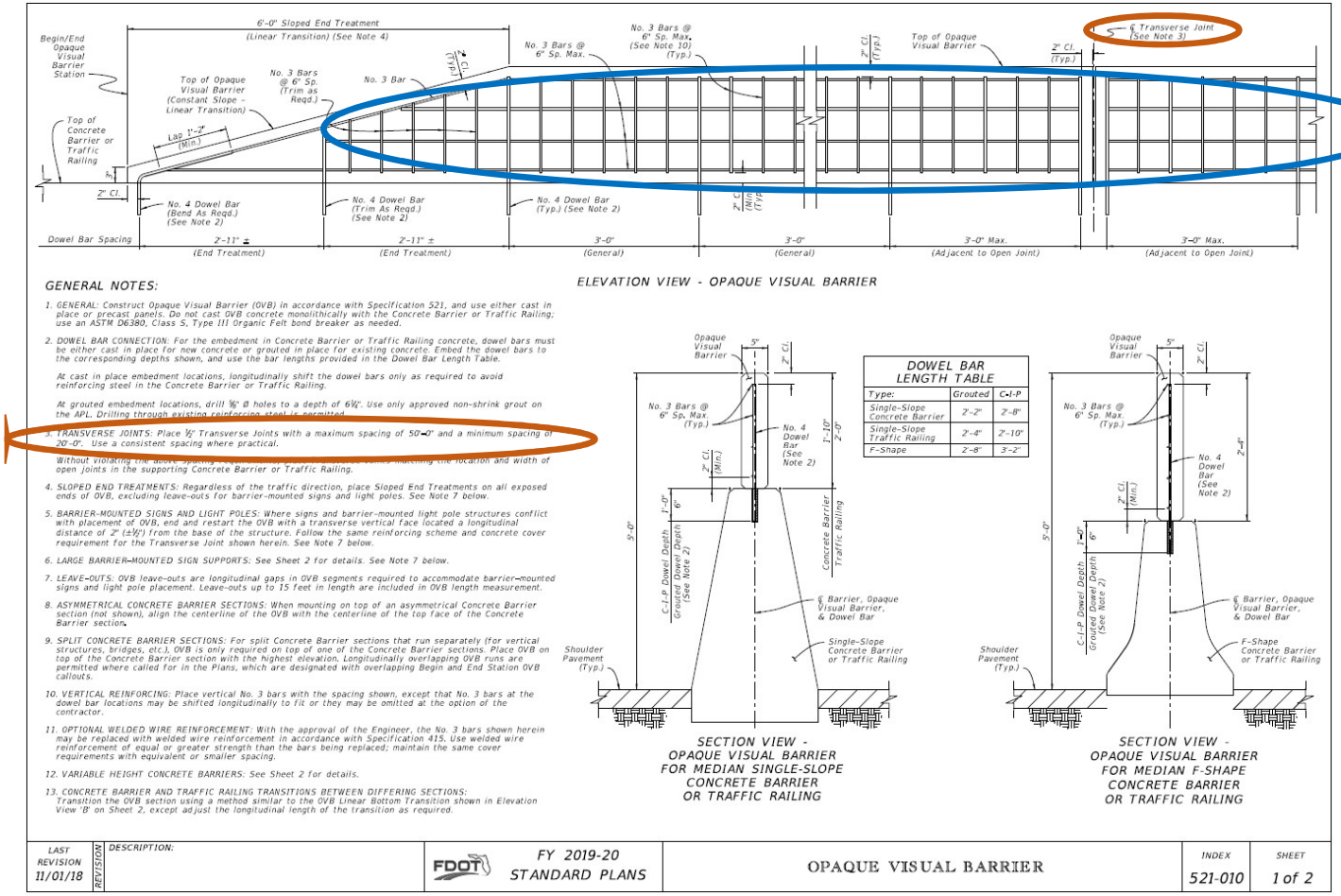
SECTION VIEW - OPAQUE VISUAL BARRIER FOR MEDIAN SINGLE-SLOPE CONCRETE BARRIER OR TRAFFIC RAILING

SECTION VIEW - OPAQUE VISUAL BARRIER FOR MEDIAN F-SHAPE CONCRETE BARRIER OR TRAFFIC RAILING

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

- **<u>Notes rewritten</u> for clarity with new headings**
- **<u>New OVB Heights</u>:**
  Now accommodates multiple cases:
  - **New Single-Slope Concrete Barrier & Bridge Traffic Railing**
  - **Old F-Shape Barrier (Existing)**

Sheet 1: *Redeveloped* OVB – New Heights and Features



ELEVATION VIEW - OPAQUE VISUAL BARRIER

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.

   At cast in place embedment locations, longitudinally shift the dowel bars only as required to avoid reinforcing steel in the Concrete Barrier or Traffic Railing.

   At grouted embedment locations, drill 1⅜" Ø holes to a depth of 6½". Use only approved non-shrink grout on the APL. Drilling through existing reinforcing steel is permitted.
3. TRANSVERSE JOINTS: Place ½" Transverse Joints with a maximum spacing of 50'-0" and a minimum spacing of 20'-0". Use a consistent spacing where practical.

   Without violating the above spacing requirements, adjust joint locations as necessary to maximize the location and width of open joints in the supporting Concrete Barrier or Traffic Railing.
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" (±½") 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.

SECTION VIEW - OPAQUE VISUAL BARRIER FOR MEDIAN SINGLE-SLOPE CONCRETE BARRIER OR TRAFFIC RAILING

DOWEL BAR LENGTH TABLE

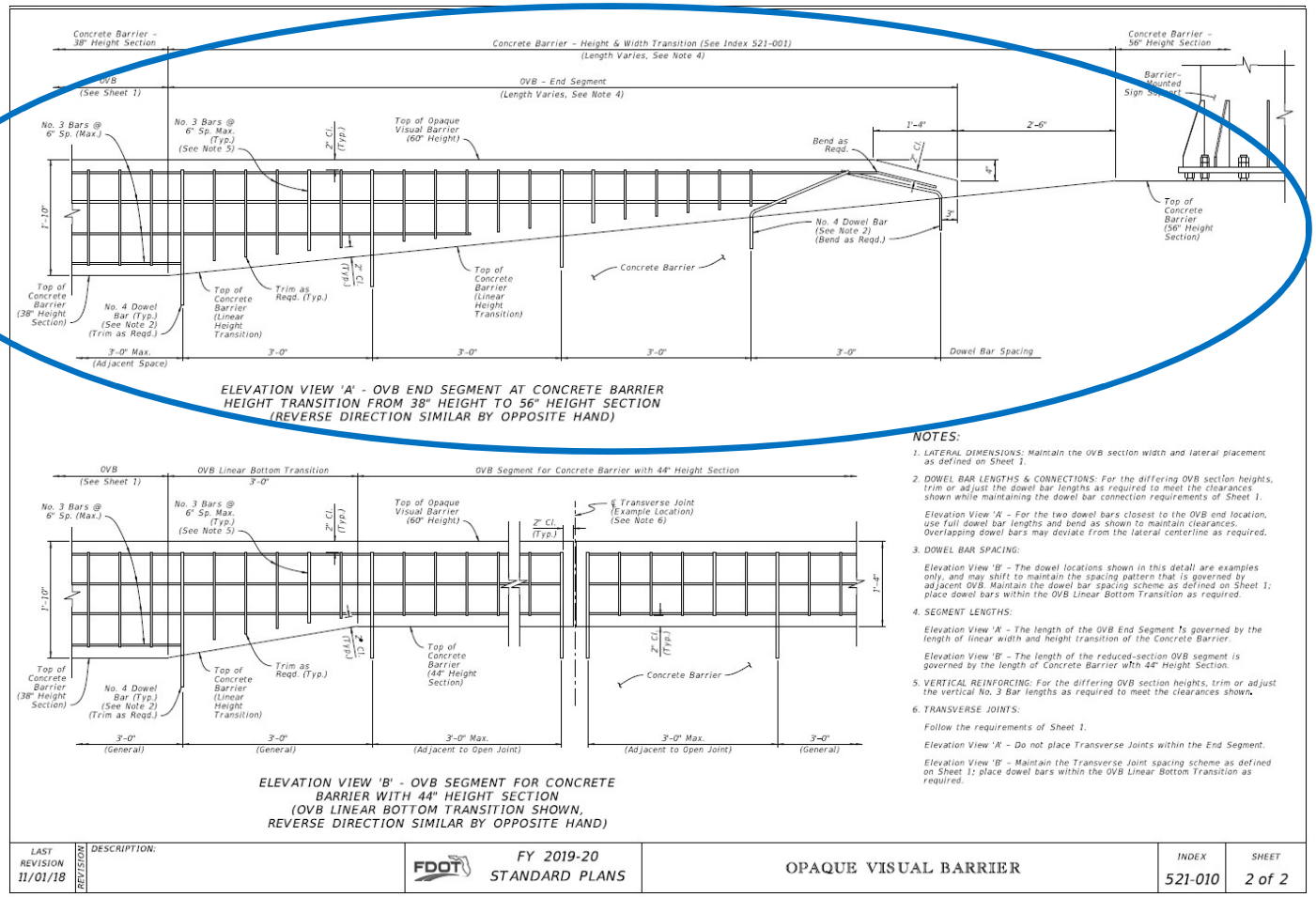
Type:	Grouted	C-I-P
Single-Slope Concrete Barrier	2'-2"	2'-8"
Single-Slope Traffic Railing	2'-4"	2'-10"
F-Shape	2'-8"	3'-2"

SECTION VIEW - OPAQUE VISUAL BARRIER FOR MEDIAN F-SHAPE CONCRETE BARRIER OR TRAFFIC RAILING

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

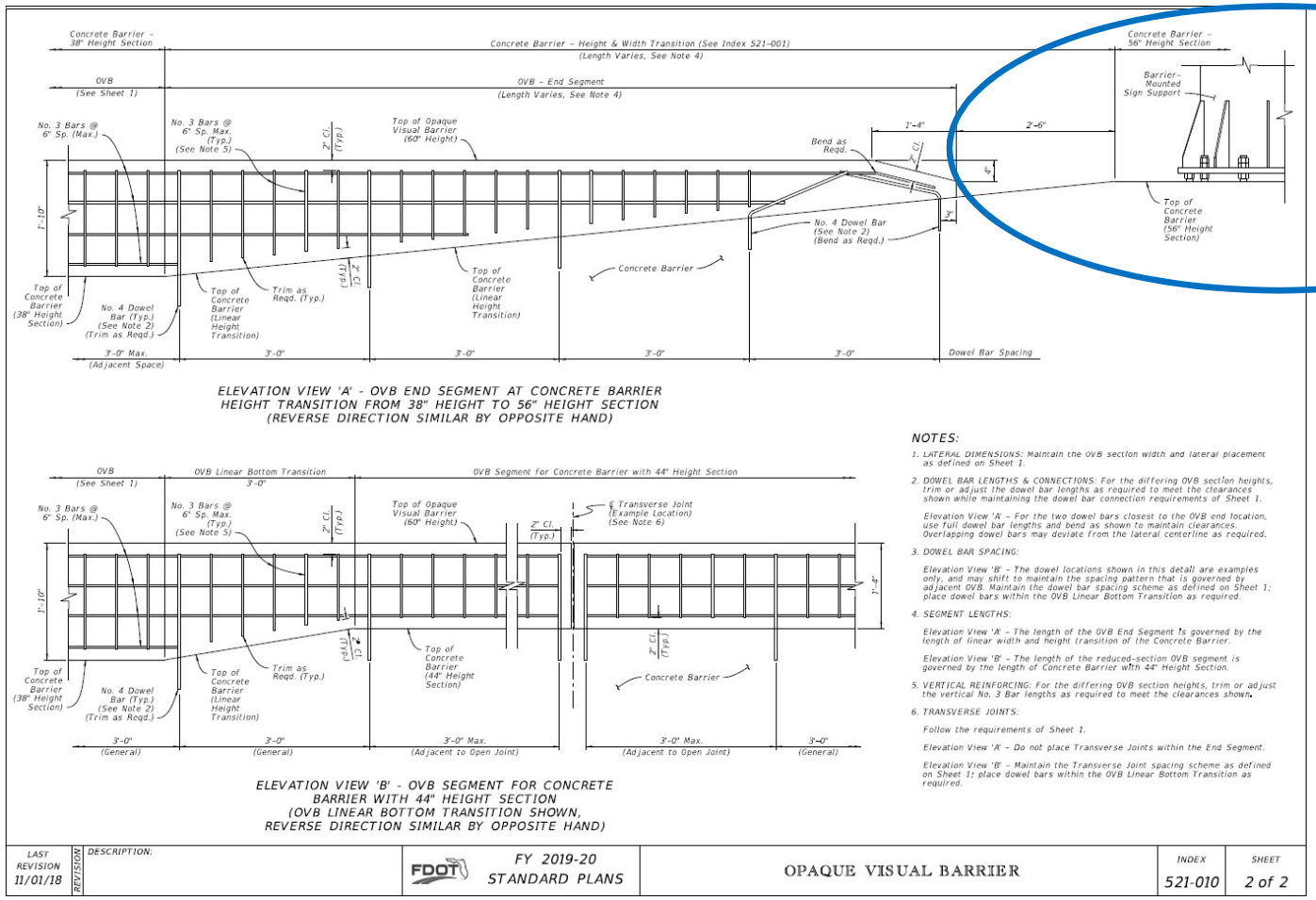
- **Tighter Reinforcing:** web now 6" spacing
- **Longer Panel Lengths:** minimum joint spacing of 20 feet

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



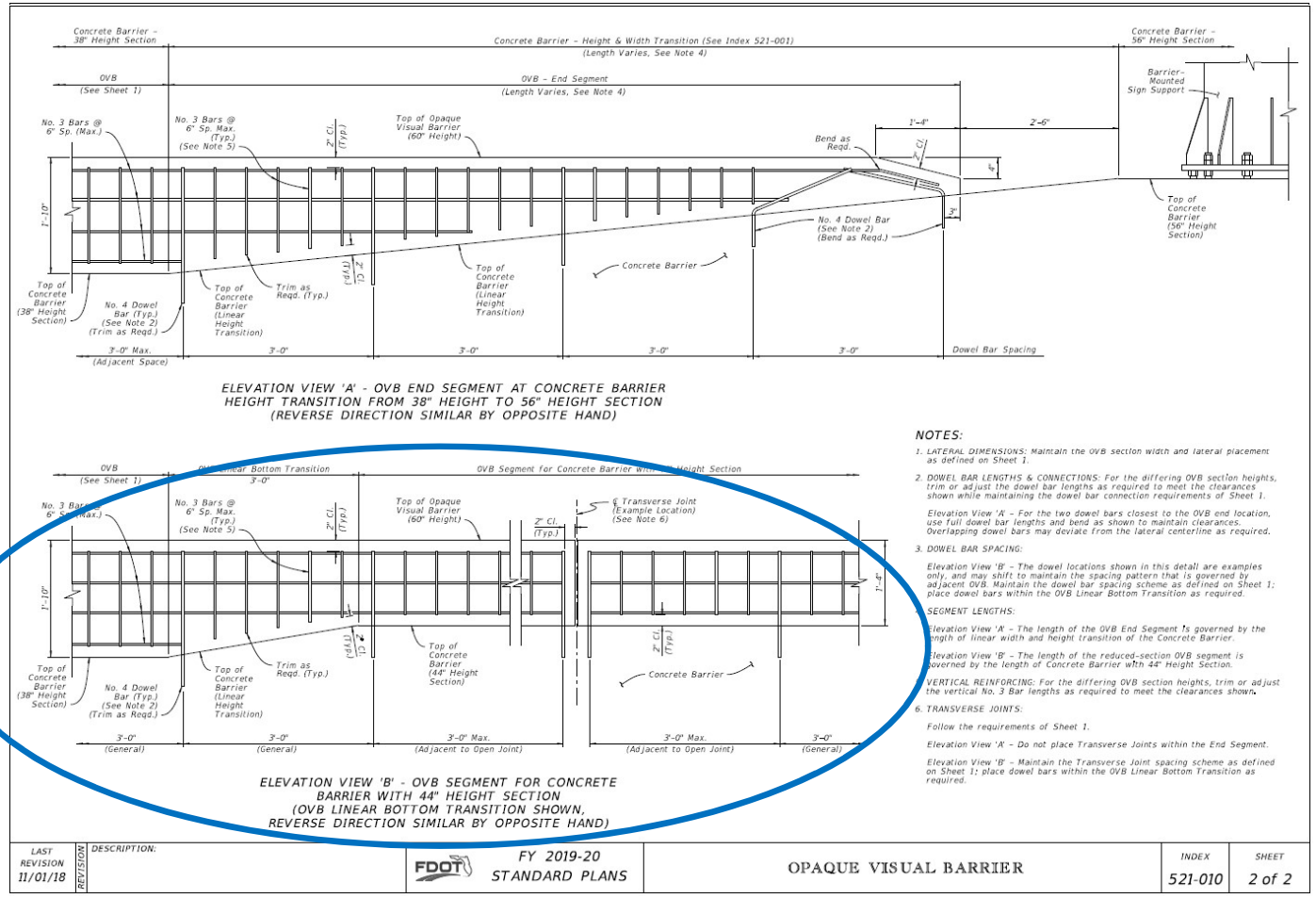
- Large Sign Support with 56" Height Barrier (per Index 521-001)

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)

SPI: *New* Standard Plans Instructions

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

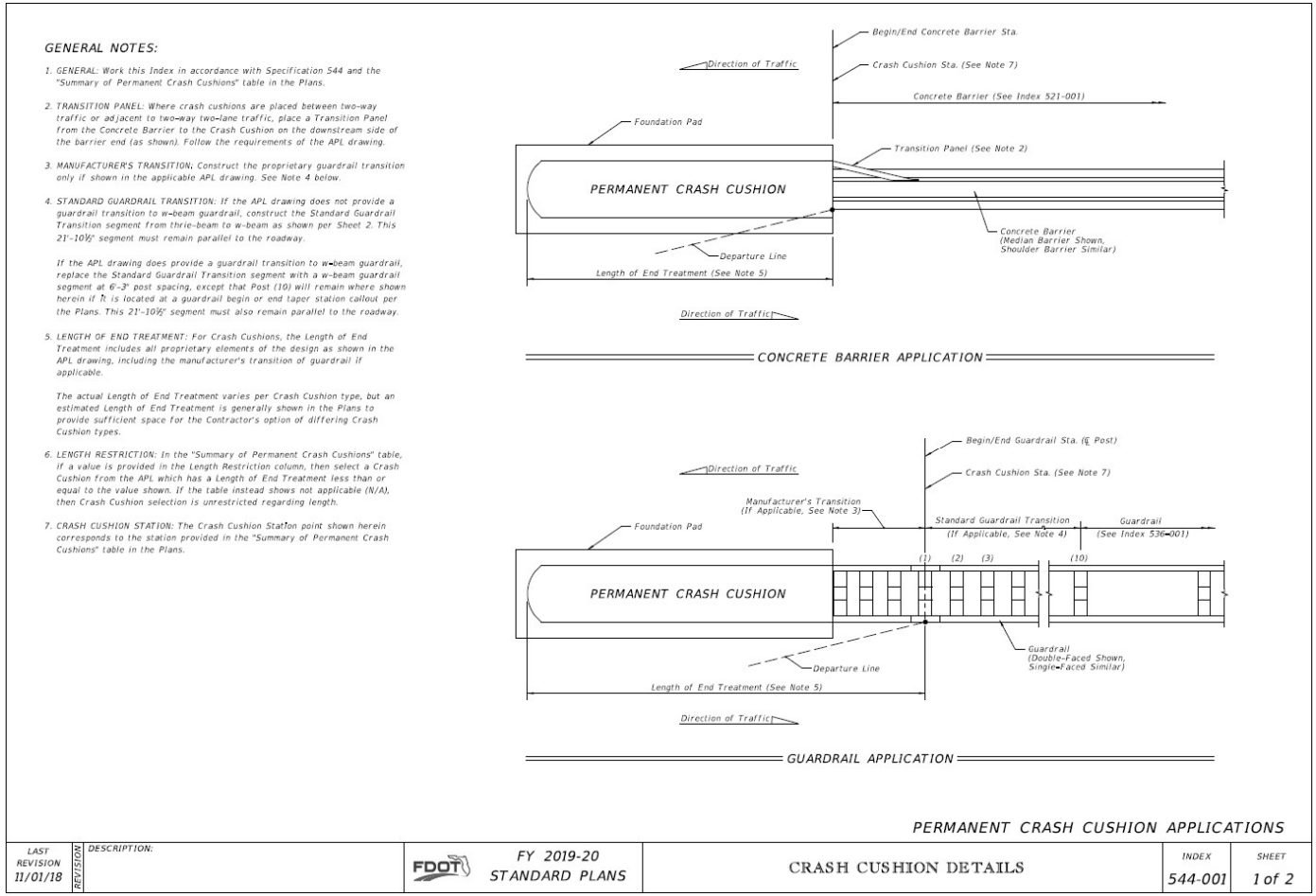
✓ **2) *Index 521-001* – Concrete Barrier**
- *New* Barrier-Mounted Sign Support Option – Dual Supports
- *New* Callouts for "Variable Section Width" Start/Stop Points
- *New* "Wall Shielding Barrier" & General "Max. Taper Rates"

✓ **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 thrie-beam to w-beam as shown per Sheet 2. This 21'-10½" segment must remain parallel to the roadway.

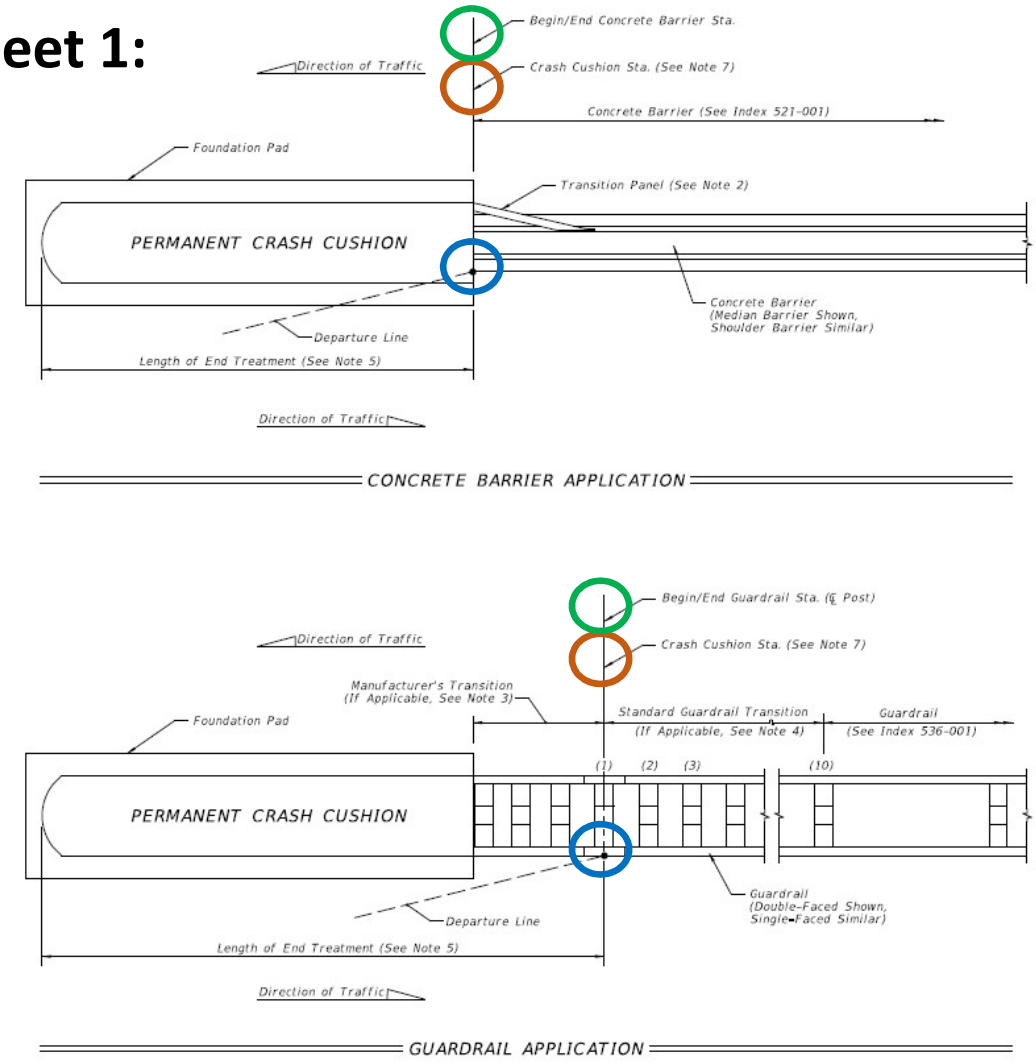
   If the APL drawing does provide a guardrail transition to w-beam guardrail, replace the Standard Guardrail Transition segment with a w-beam guardrail segment at 6'-3" post spacing, except that Post (10) will remain where shown herein if it is located at a guardrail begin or end taper station callout per the Plans. This 21'-10½" 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.

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

Crash Cushion Details, Index 544-001

Sheet 1:

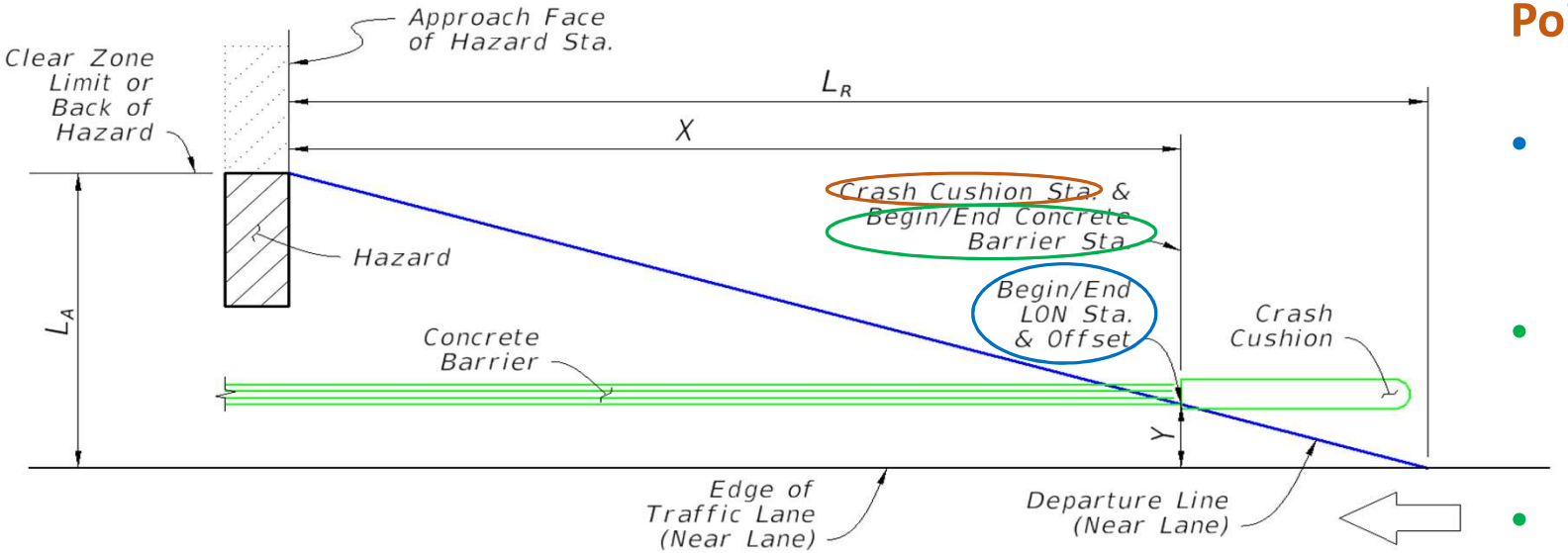


First Concept:

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):



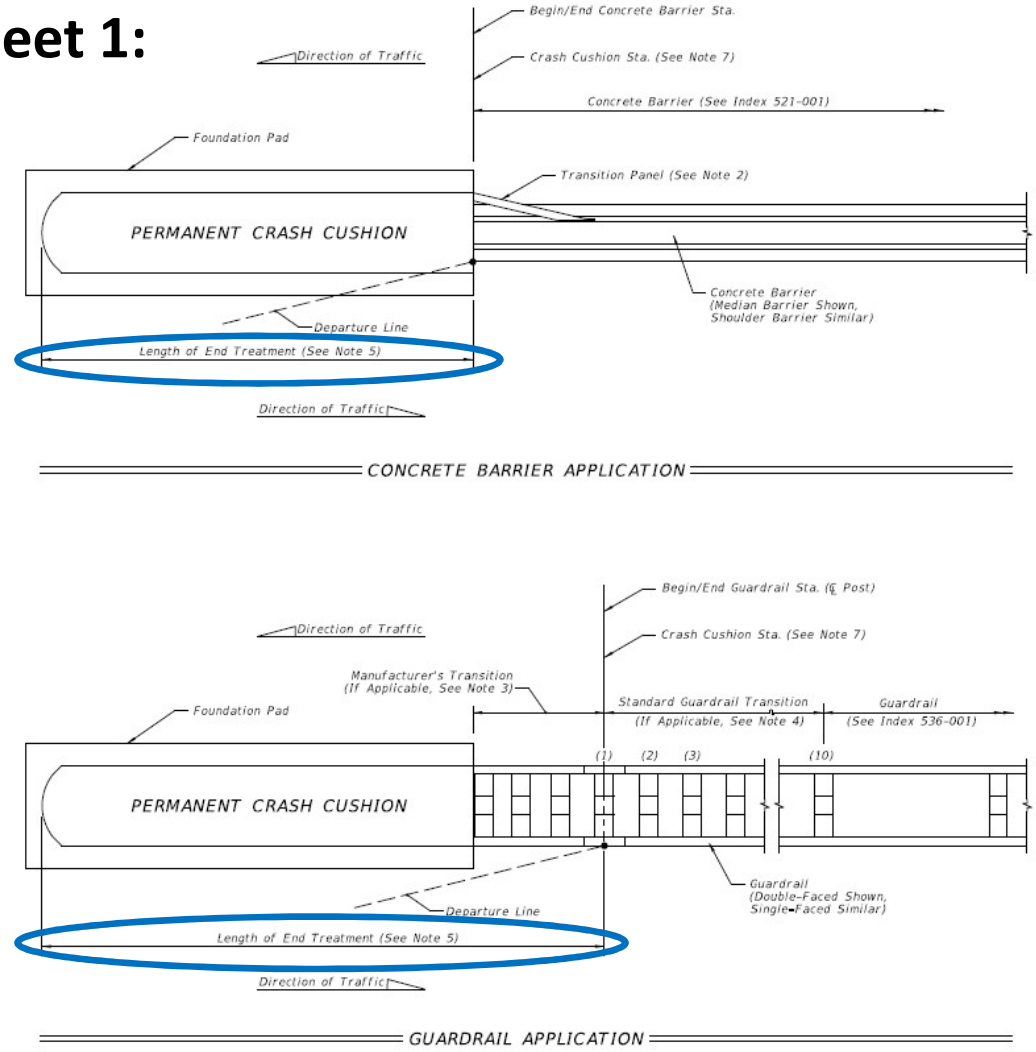
First Concept:

Crash Cushion Callout Point is the same as the:

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

Crash Cushion Details, Index 544-001

Sheet 1:



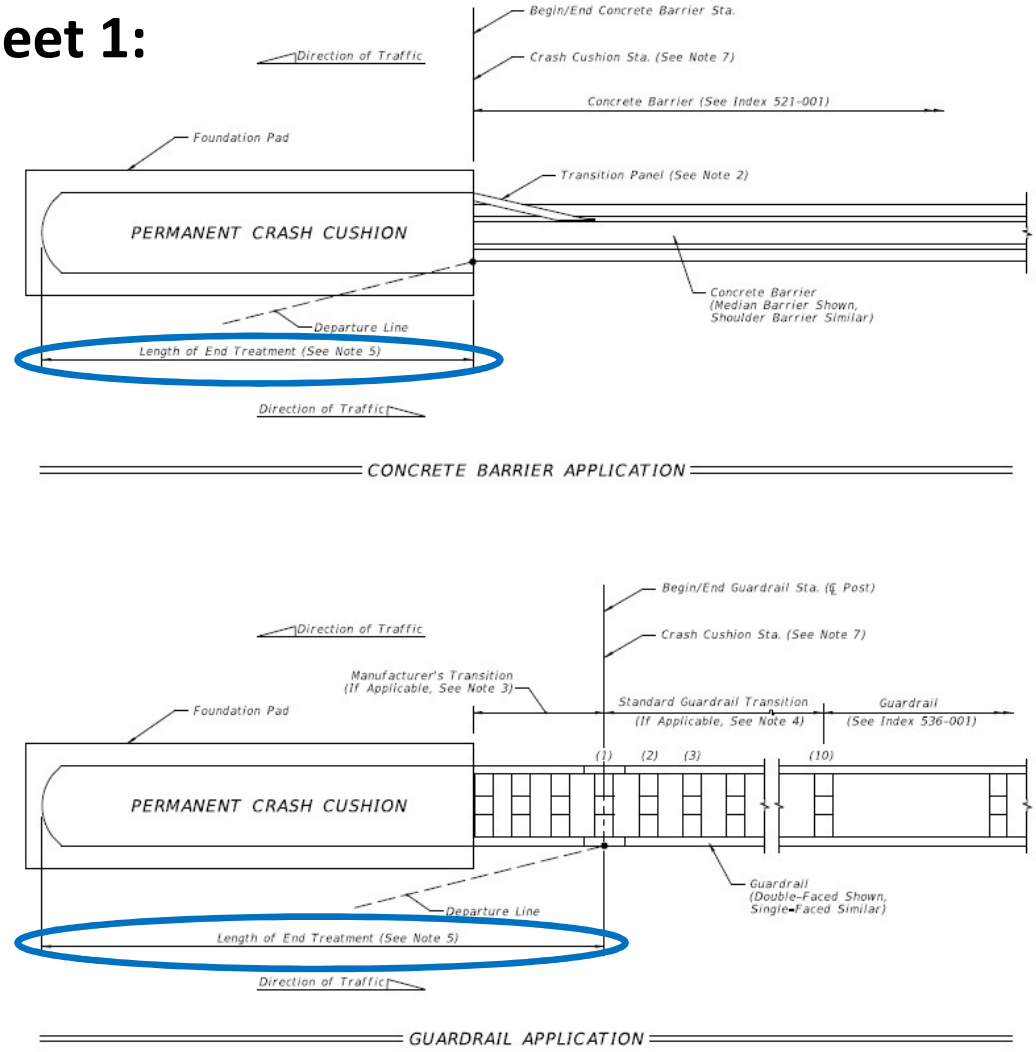
Second Concept:

'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"*

Crash Cushion Details, Index 544-001

Sheet 1:



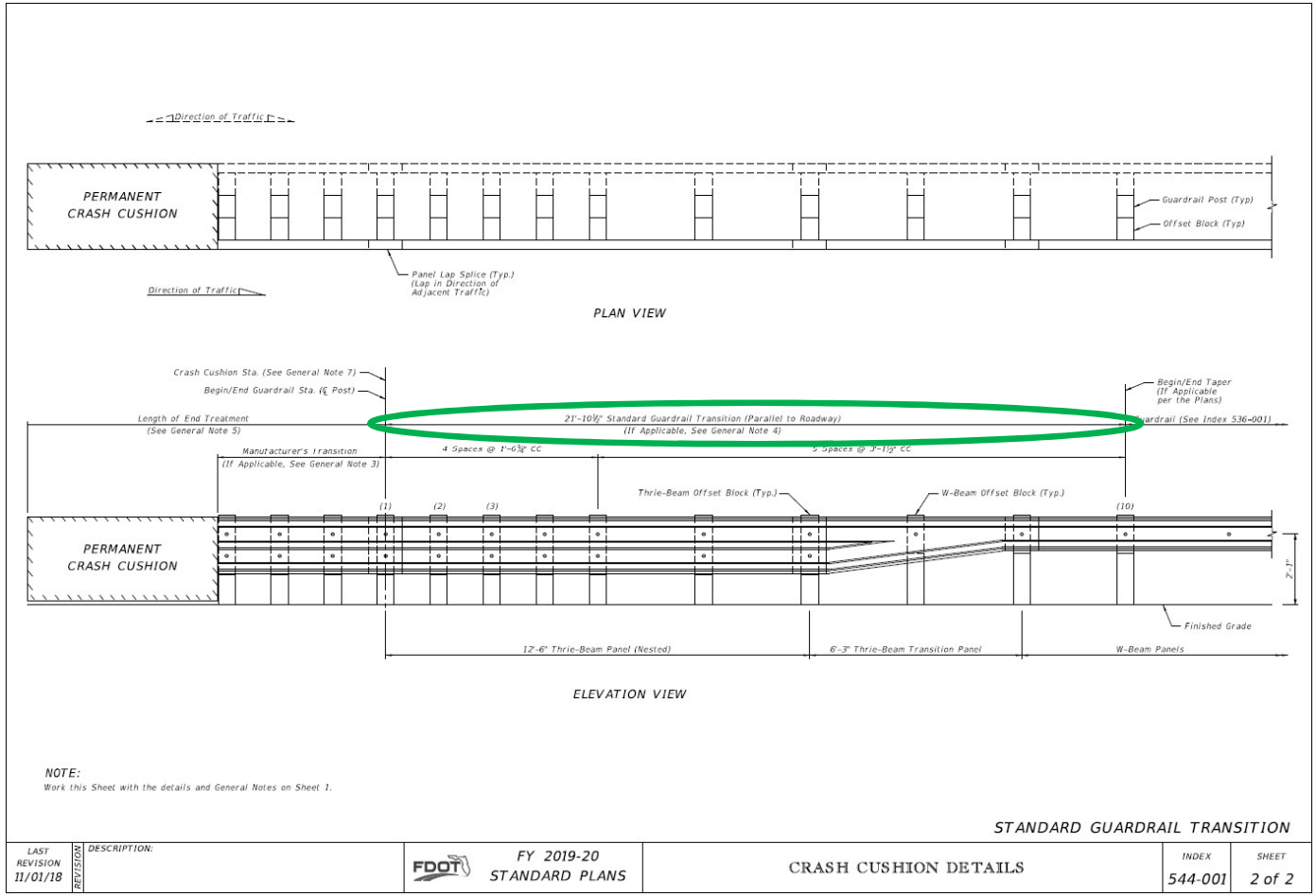
Second Concept:

'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):

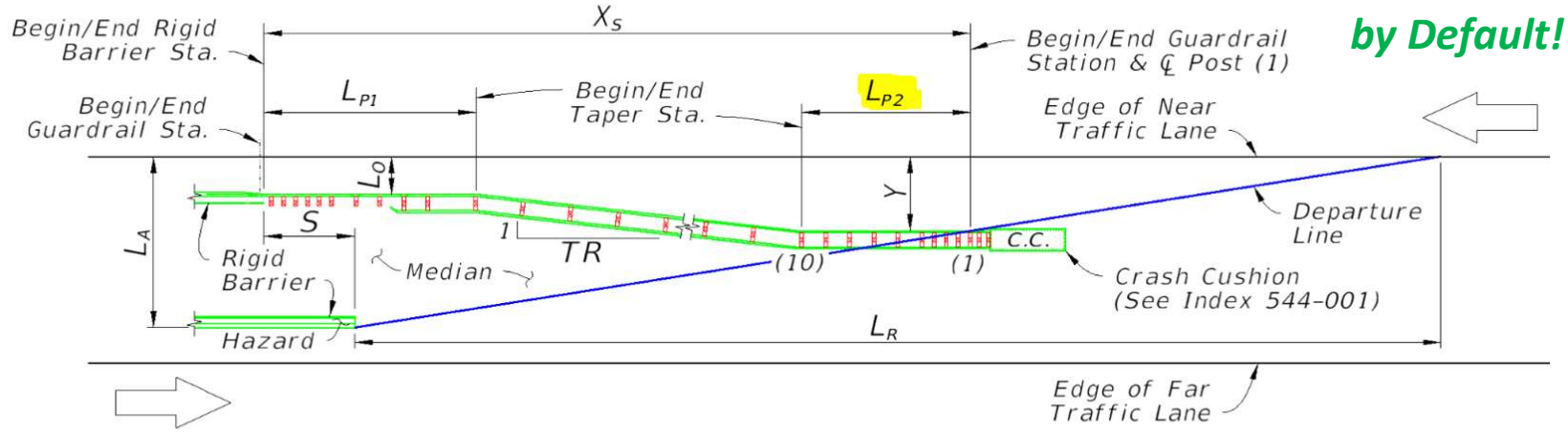
Redeveloped – Standard Guardrail Transition

Third Concept:

'Standard Guardrail Transition'

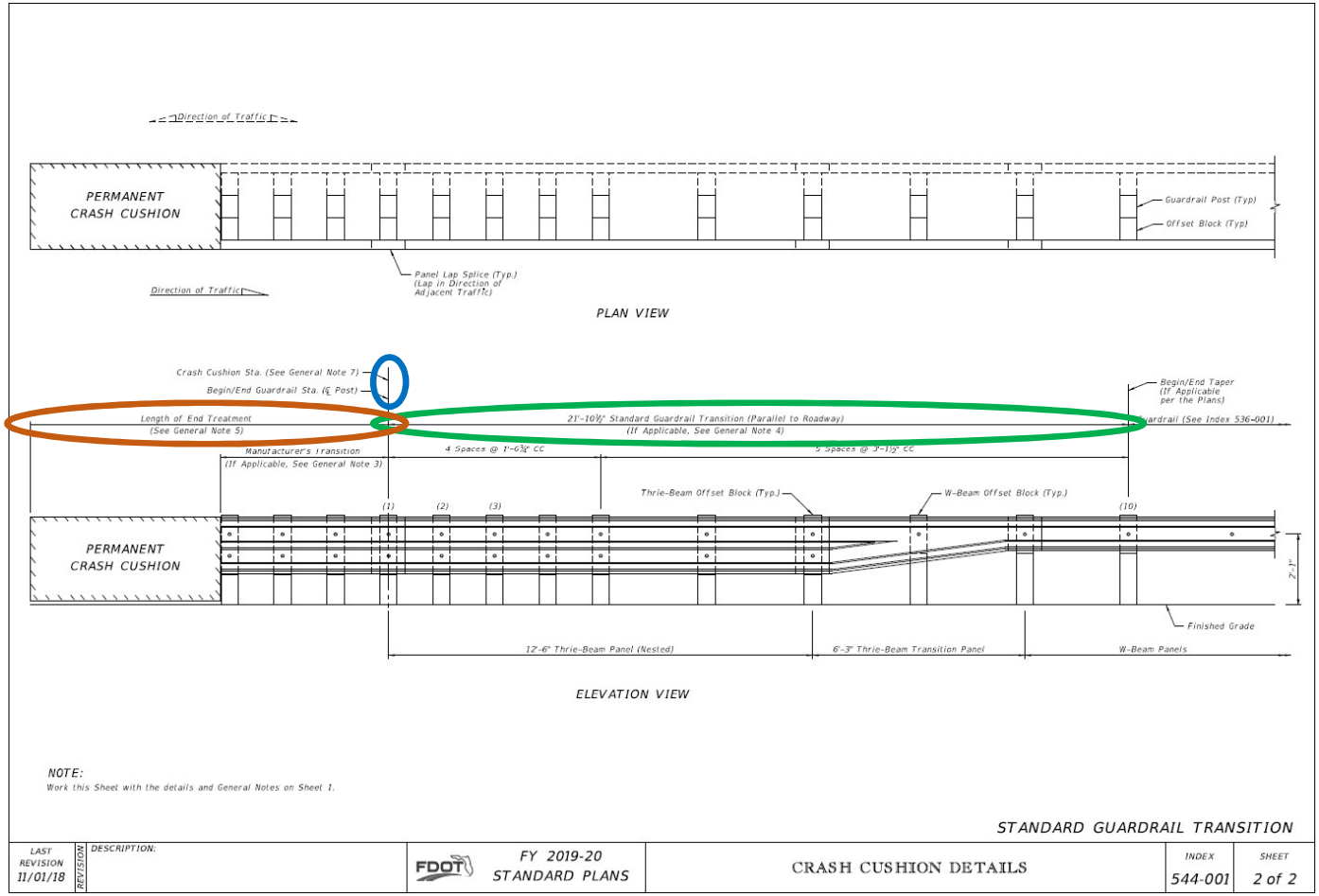
- ***L_{p2} = 'Length of Standard Guardrail Transition' by Default!***

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

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)

"LOCATION":
Defined in SPI, Part A

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	P	F		

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)

"SYSTEM WIDTH":
Defined in SPI, Part D

Added to *Pay Item Description* Automatically When Pay Item Selected (D&C Manager CADD Tool)

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	P	F		

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)

"CRASH TEST LEVEL":
Defined in SPI, Part C

Added to *Pay Item Description* Automatically When Pay Item Selected (D&C Manager CADD Tool)

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	P	F		

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)

"BARRIER WIDTH":
Defined in SPI, Part D

For example: 24" for Concrete Median Barrier

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	P	F		

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):

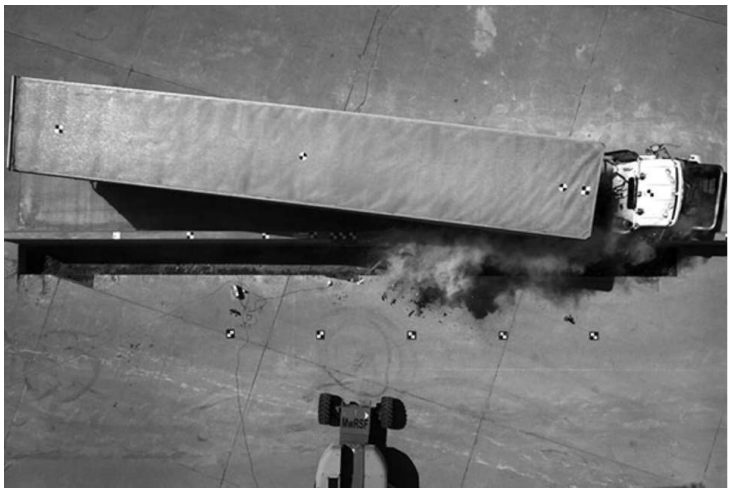
1. *Location (Station and Side), See the Crash Cushion Station in ***Index 544-001***
2. *Crash Cushion System Width (Narrow or Wide)
3. *Crash Test Level (TL-2 or TL-3)
4. *Barrier Width (Inches)
5. **Length Restriction (Based on site specific space constraints)

"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	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	3130
60	2400
55	1840
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/oversized 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 these 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 (TCP's) 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 500' 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 plates 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 1, Chapter 10.

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

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

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

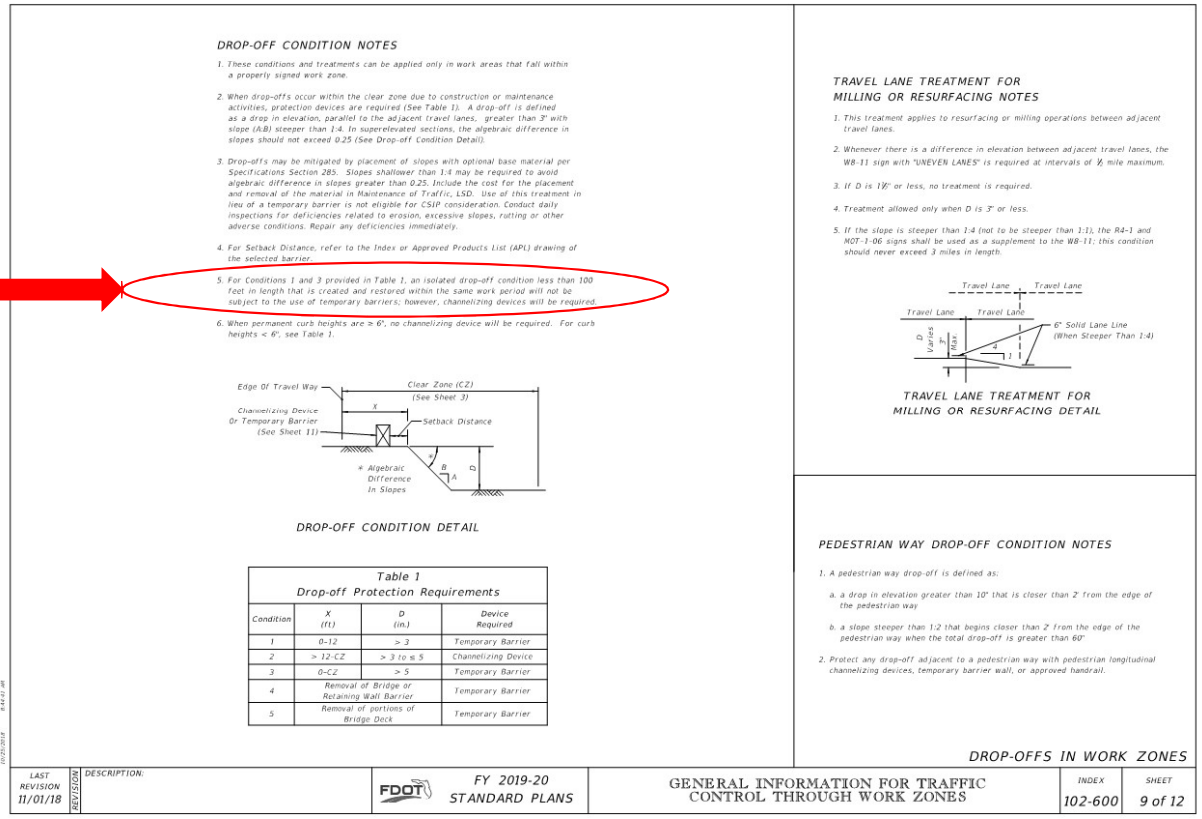
Sheet 9 of 12

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

1. These conditions and treatments can be applied only in work areas that fall within a properly signed work zone.
2. 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 (A:B) steeper than 1:4. In superelevated sections, the algebraic difference in slopes should not exceed 0.25 (See Drop-off Condition Detail).
3. 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.
4. For Setback Distance, refer to the Index or Approved Products List (APL) drawing of the selected barrier.
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.
6. When permanent curb heights are ≥ 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

1. This treatment applies to resurfacing or milling operations between adjacent travel lanes.
2. Whenever there is a difference in elevation between adjacent travel lanes, the W8-11 sign with "UNEVEN LANES" is required at intervals of ½ mile maximum.
3. If D is 1½" or less, no treatment is required.
4. Treatment allowed only when D is 3" or less.
5. If the slope is steeper than 1:4 (not to be steeper than 1:1), the R4-1 and NOT-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

1. A pedestrian way drop-off is defined as:
   a. a drop in elevation greater than 10" that is closer than 2' from the edge of the pedestrian way
   b. 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"
2. 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		FY 2019-20 STANDARD PLANS	GENERAL INFORMATION FOR TRAFFIC CONTROL THROUGH WORK ZONES	INDEX 102-600	SHEET 9 of 12

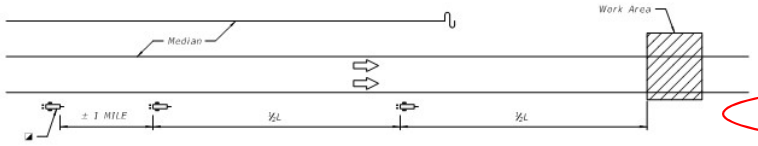
Traffic Pacing, Index 102-655

Sheet 1 of 3

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.

CHANGEABLE MESSAGE SIGNS
(Typical Placement and Messages)



L = Length of Traffic Pacing Operation

CHANGEABLE MESSAGE SIGN MESSAGE
(MAINLINE AND RAMPS)

ONE WEEK PRIOR TO PACING OPERATION	EXPECT DELAYS ON	MMM DD-DD X AM - X AM
DURING DAY OF PACING OPERATION	ROAD WORK TONIGHT	EXPECT PERIODIC DELAYS
DURING PACING OPERATION	SLOW TRAFFIC AHEAD	BE PREPARED TO STOP

Symbols

- 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

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.

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.

New

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.

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

10/18/2018 5:45:08 PM

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**

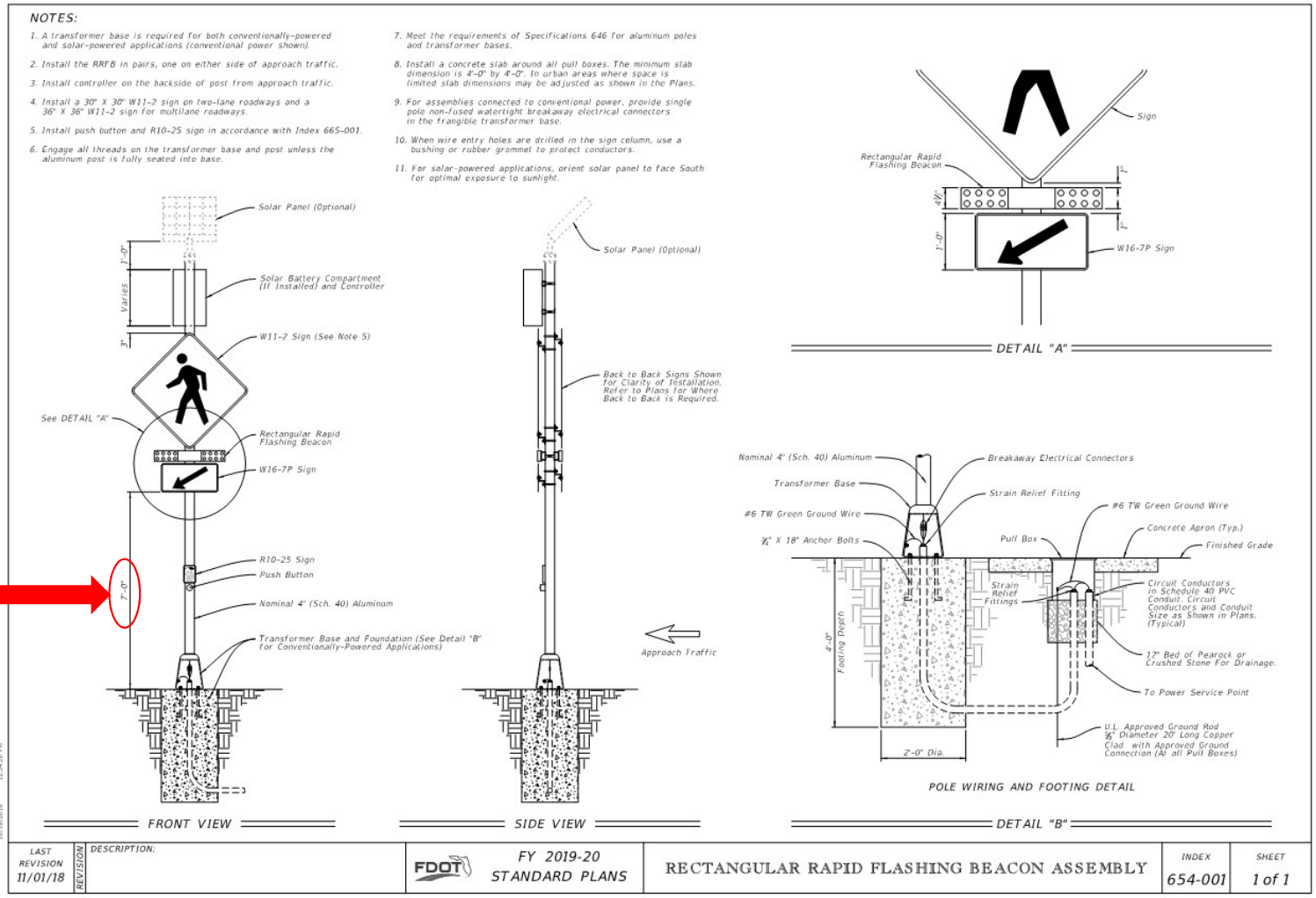
3) ***Lighting Indexes***

Rectangular Rapid Flashing Beacon Assembly, Index 654-001

Sheet 1 of 1

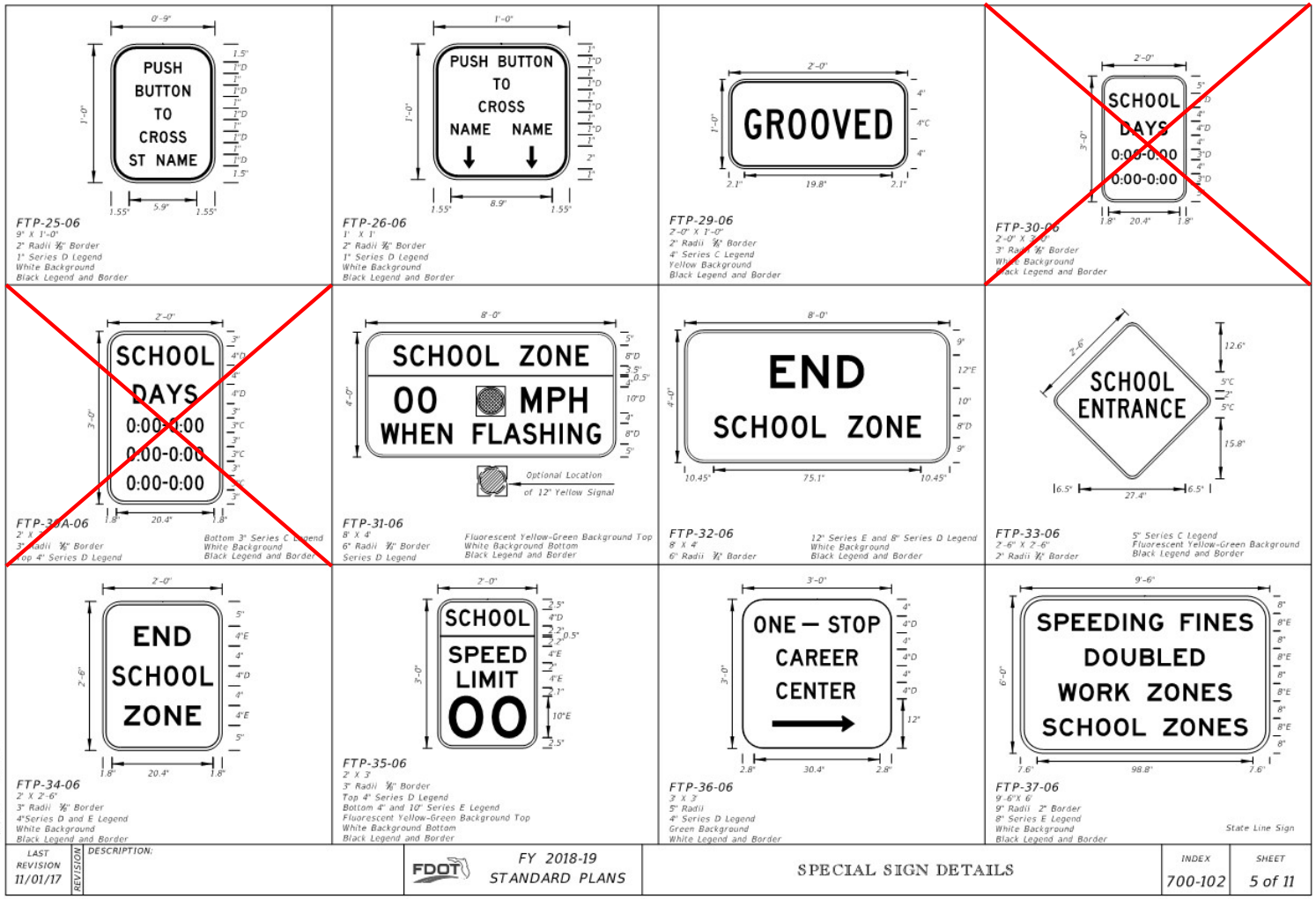
New!

Changed



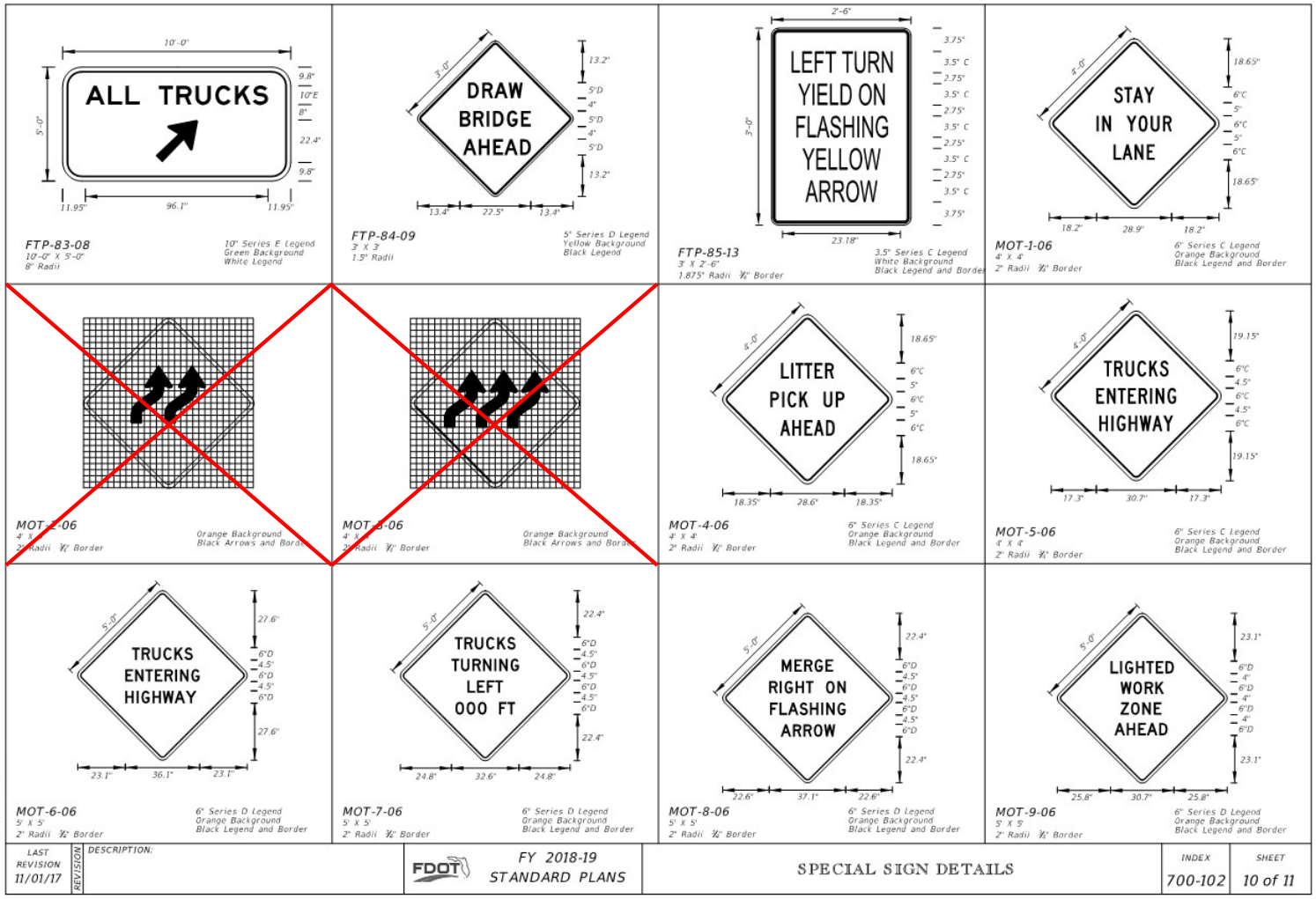
Special Sign Details, Index 700-102

Sheet 5 of 11



Special Sign Details, Index 700-102

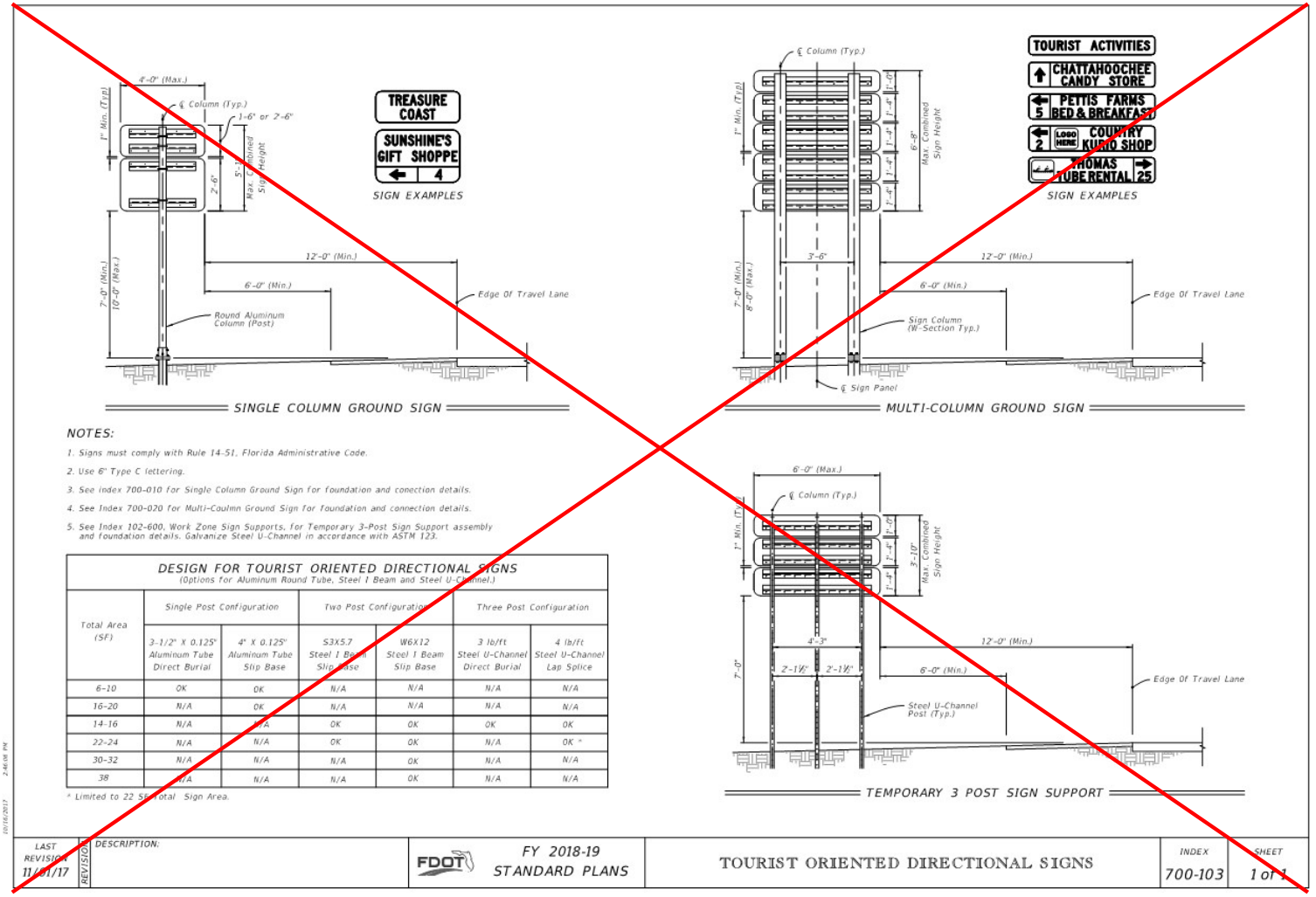
Sheet 10 of 11



Tourist Oriented Directional Signs, Index 700-103

Sheet 1 of 1

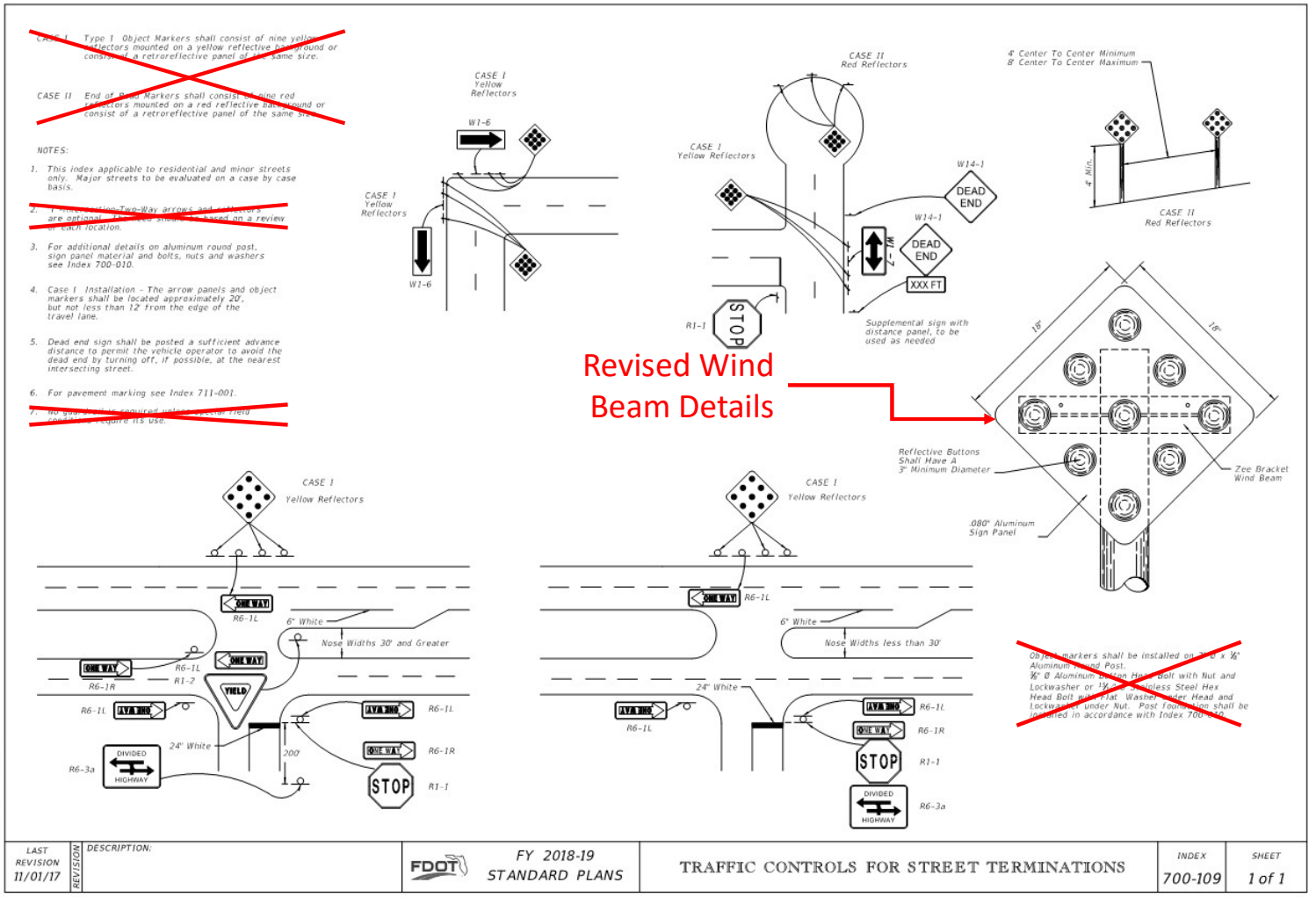
Deleted Index and moved the details into FDM 230.2.10.



Traffic Controls for Street Terminations, Index 700-109

Sheet 1 of 1

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

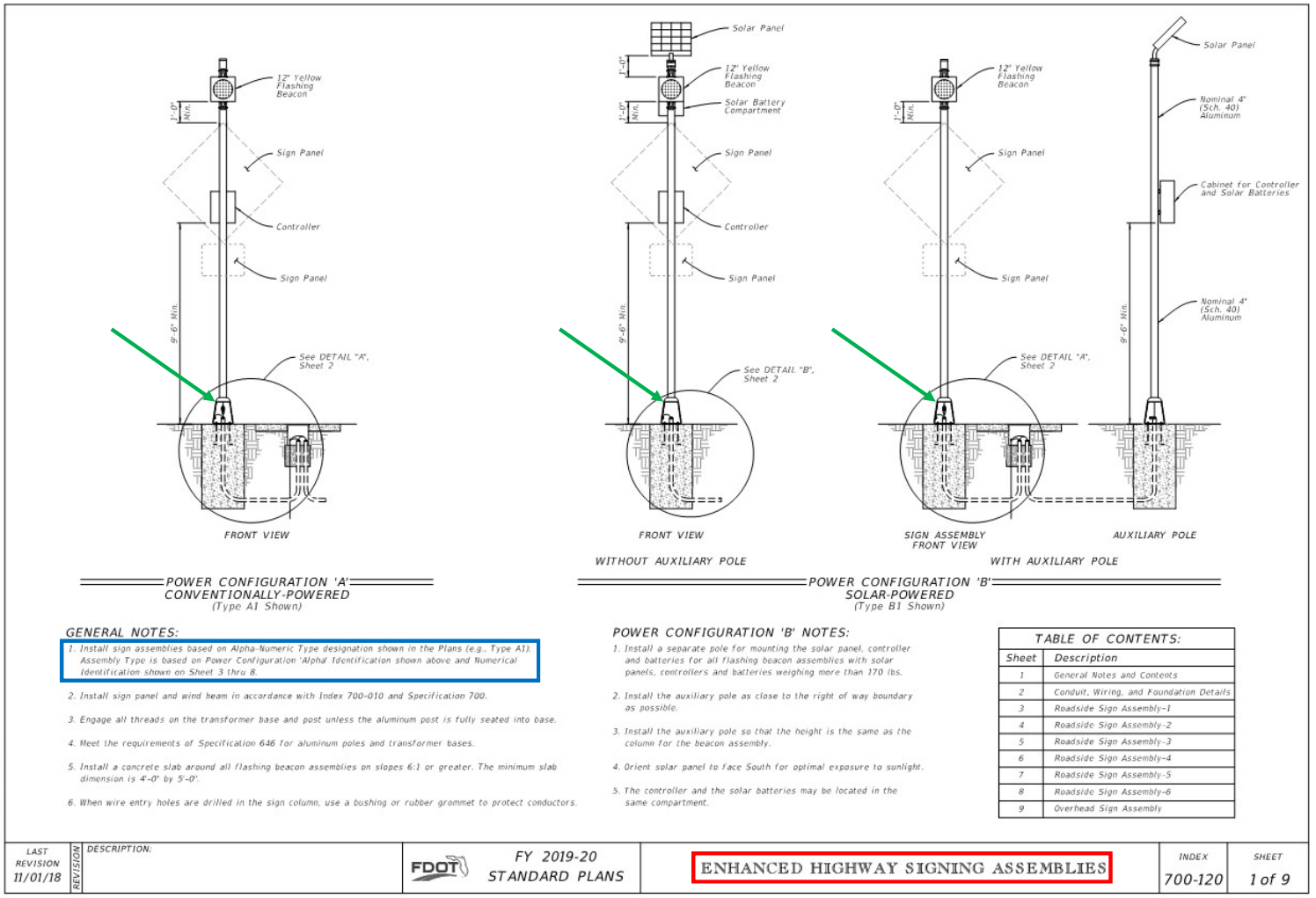


Enhanced Highway Signing Assemblies, Index 700-120

Sheet 1 of 1

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

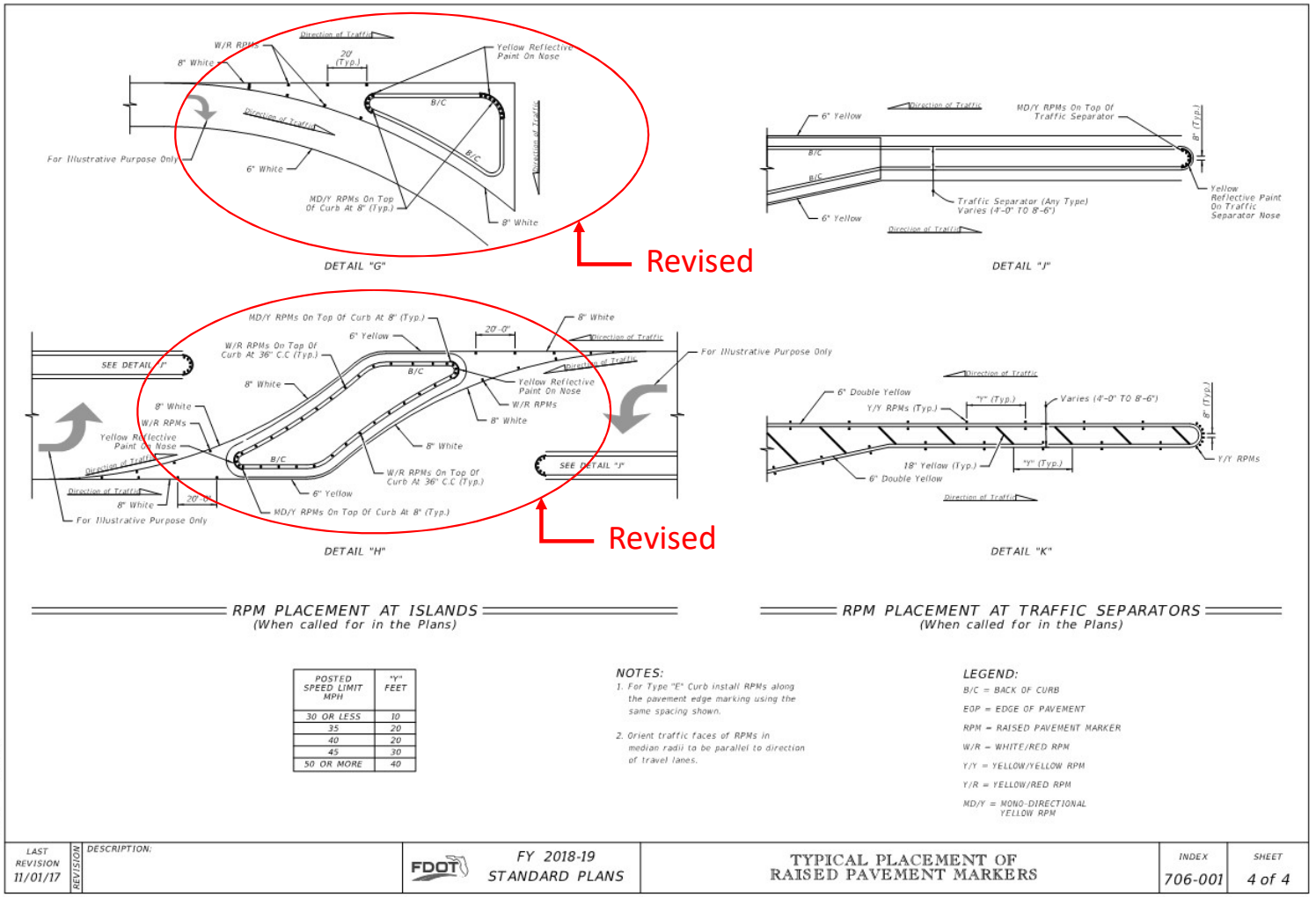
- **Changed title to "Enhanced Highway Signing Assemblies"**
- **The removal of RRFBs to separate Index 654-001**
- **An alpha-numerical system for easy identification**
- **The addition of highlighted signs**
- **The use of pedestals for all roadside signs**



Typical Placement of Raised Pavement Markers, Index 706-001

Sheet 4 of 6

Revised RPM and Reflective Yellow Paint placement.



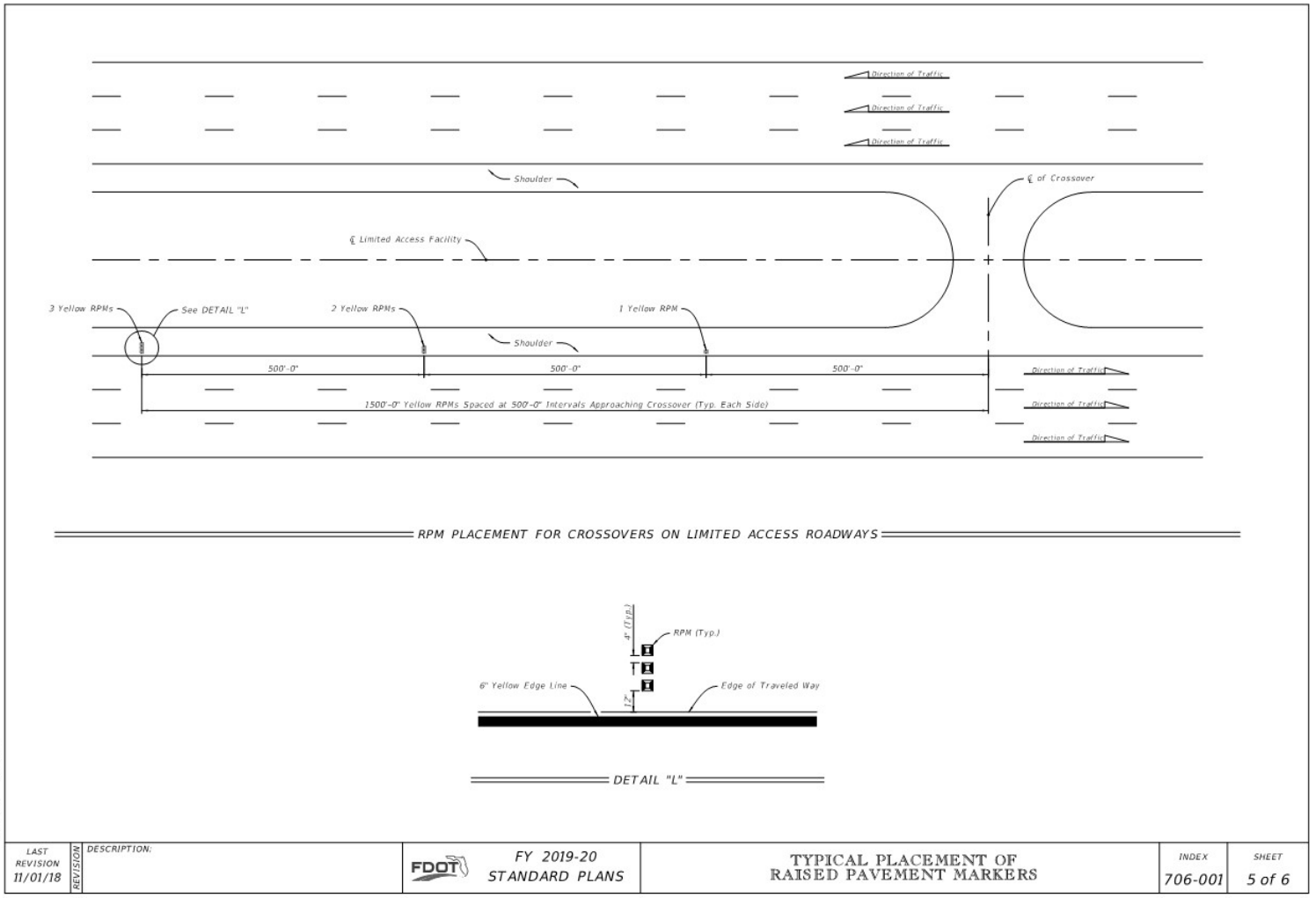
POSTED SPEED LIMIT MPH	"Y" FEET
30 OR LESS	10
35	20
40	20
45	30
50 OR MORE	40

Typical Placement of Raised Pavement Markers, Index 706-001

Sheet 5 of 6

New!

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

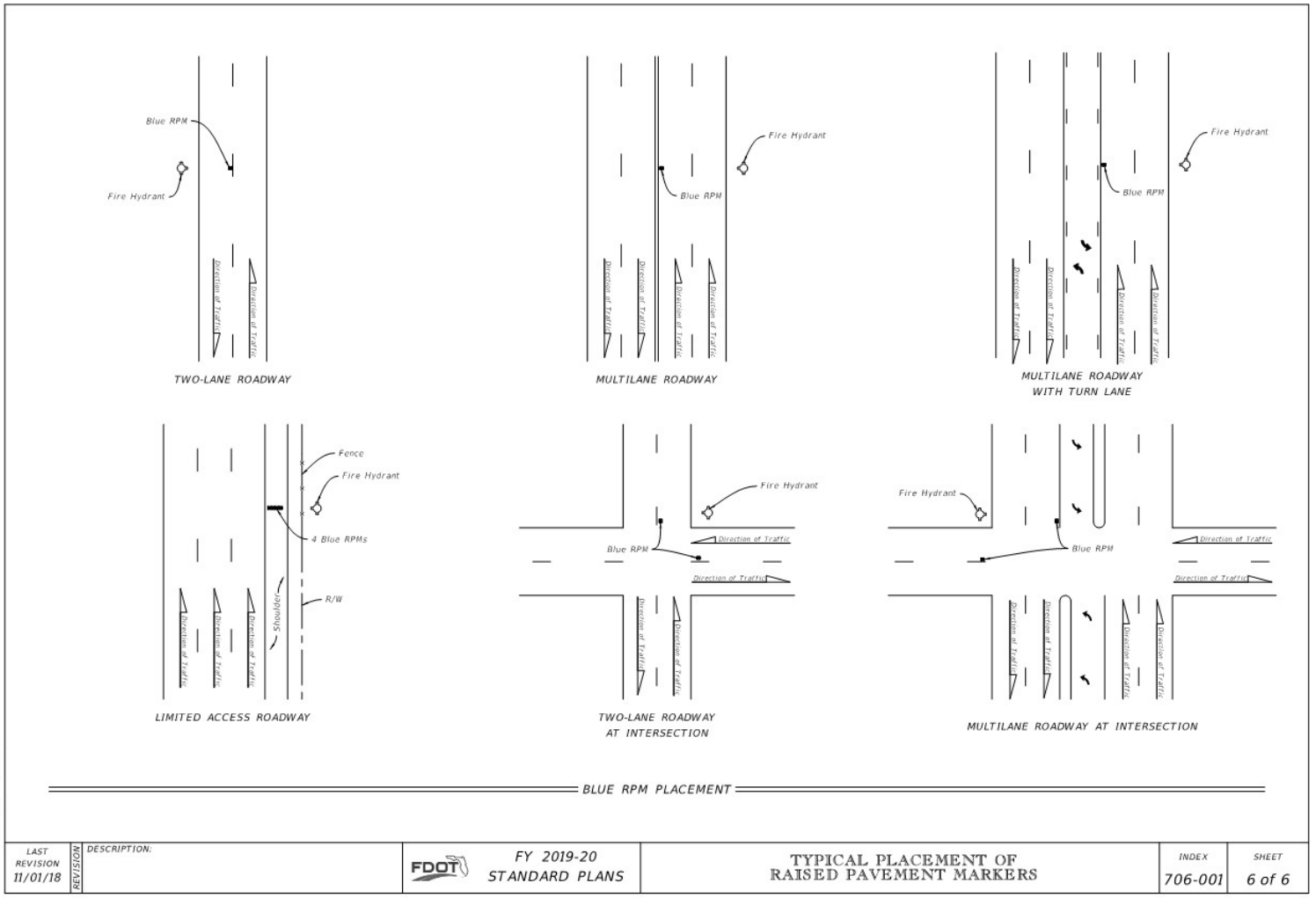


Typical Placement of Raised Pavement Markers, Index 706-001

Sheet 6 of 6

New!

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



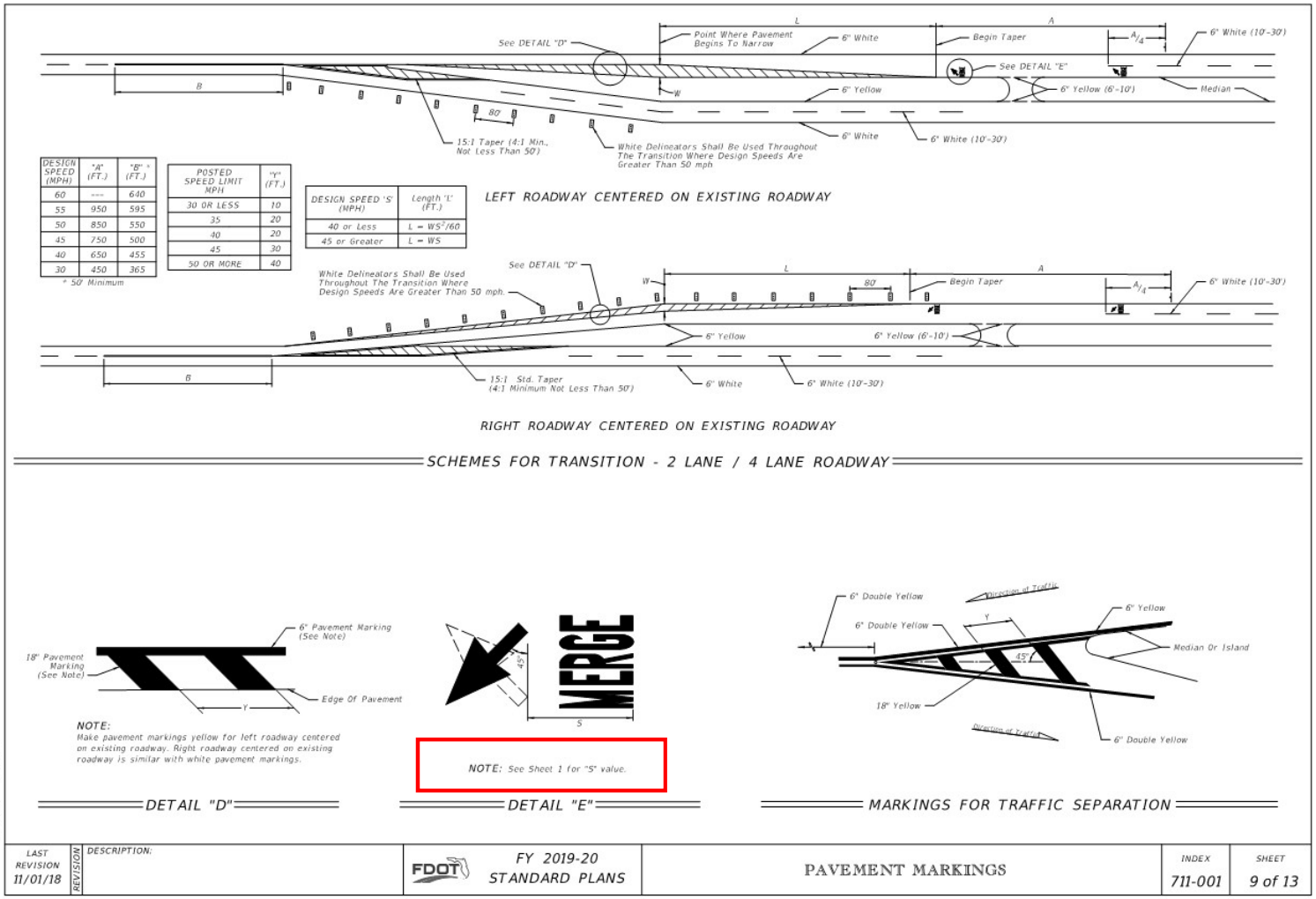
Pavement Markings, Index 711-001

Sheet 1 of 13

Significant changes on Sheet 1 are the following:

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

Sheet 9 of 13



DESIGN SPEED (MPH)	"A" (FT.)	"B" * (FT.)
60	---	640
55	950	595
50	850	550
45	750	500
40	650	455
30	450	365

* 50' Minimum

POSTED SPEED LIMIT MPH	"Y" (FT.)
30 OR LESS	10
35	20
40	20
45	30
50 OR MORE	40

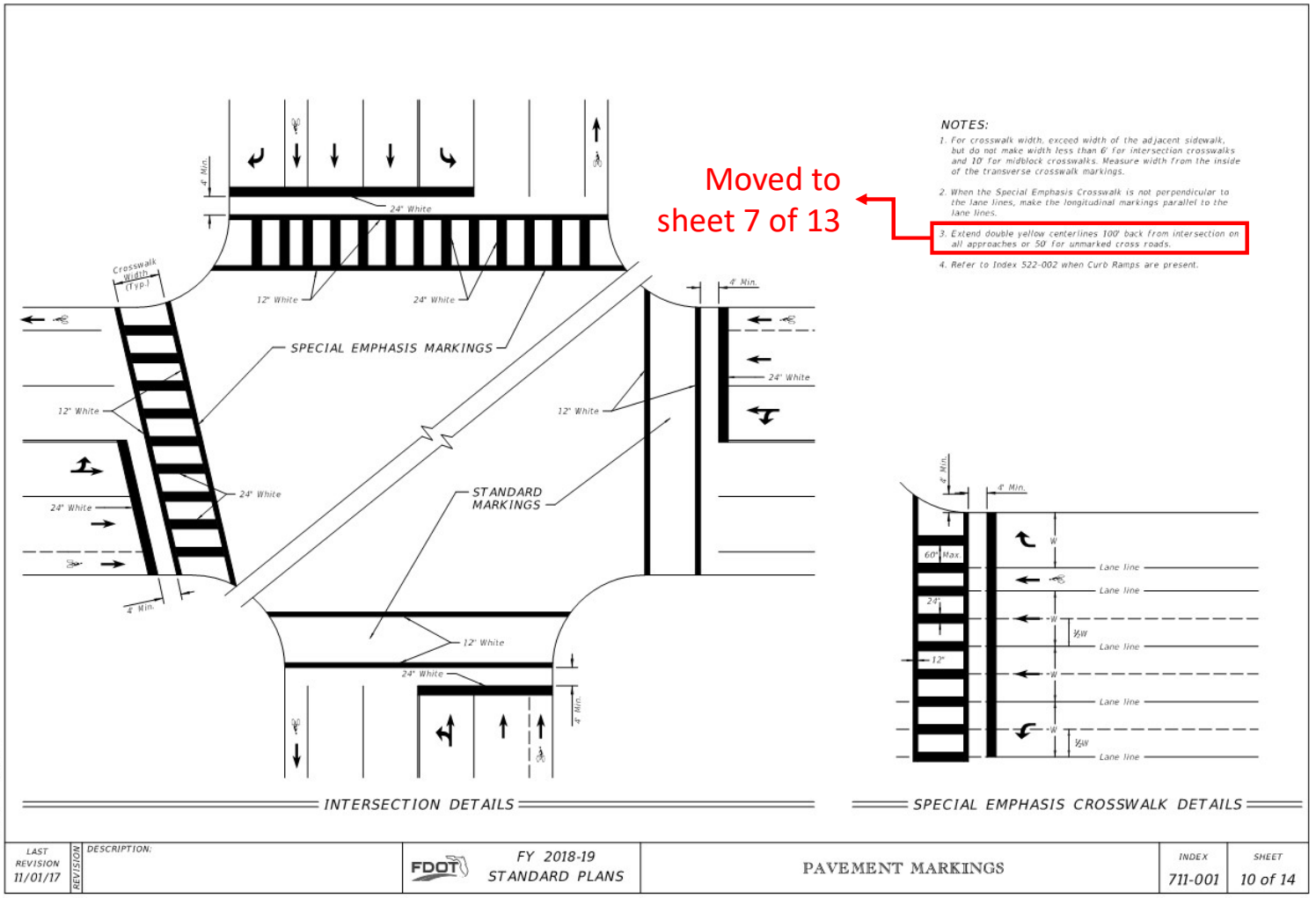
DESIGN SPEED 'S' (MPH)	Length 'L' (FT.)
40 or Less	$L = WS^2/60$
45 or Greater	$L = WS$

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	PAVEMENT MARKINGS	INDEX	SHEET
11/01/18						711-001	9 of 13

Pavement Markings, Index 711-001

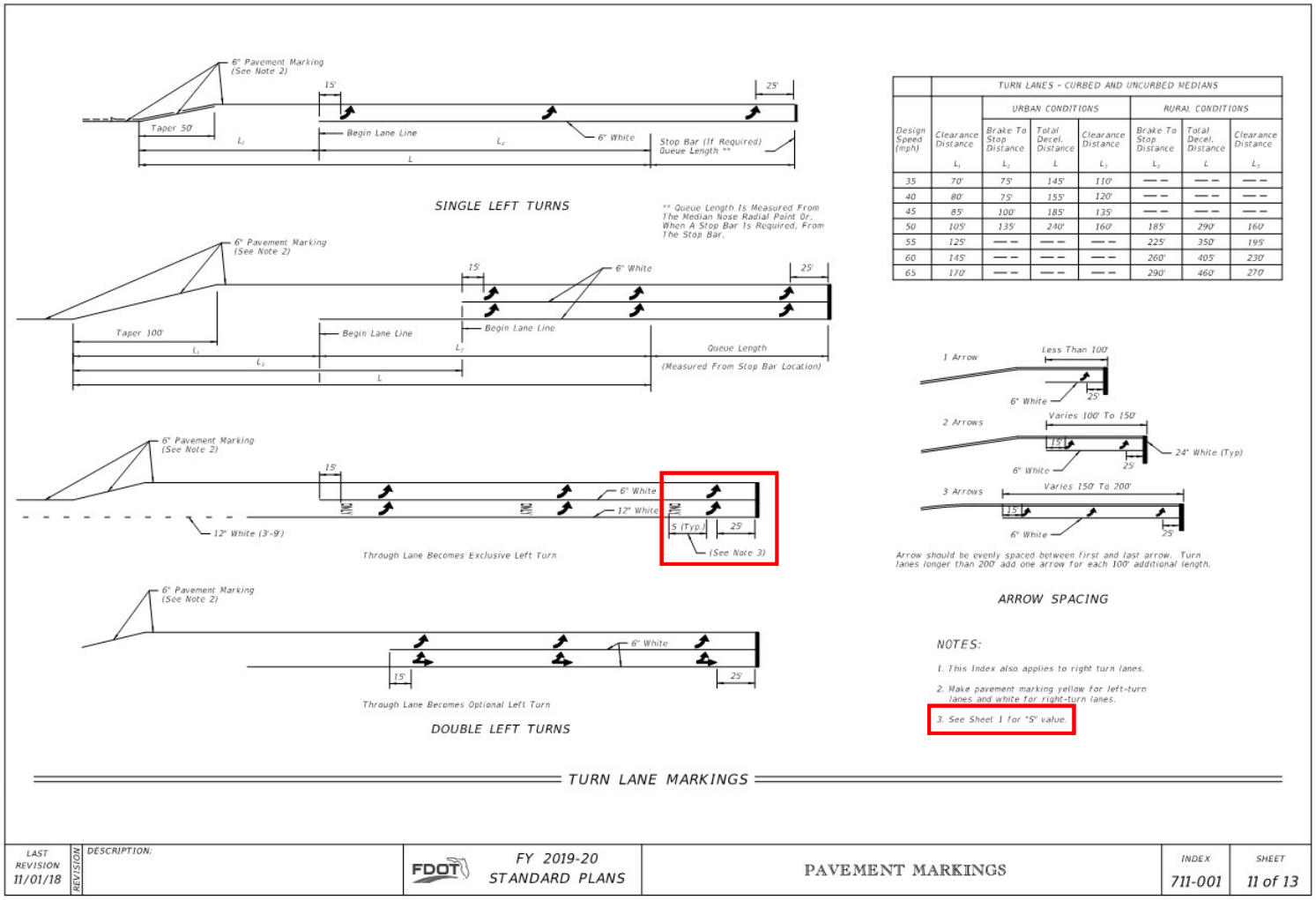
Sheet 10 of 13

Revised sheet to show only basic crosswalk pavement marking details.



Pavement Markings, Index 711-001

Sheet 11 of 13



Design Speed (mph)	TURN LANES - CURBED AND UNCURBED MEDIANS						
	URBAN CONDITIONS			RURAL CONDITIONS			
	Clearance Distance L_1	Brake To Stop Distance L_2	Total Decel. Distance L	Clearance Distance L_1	Brake To Stop Distance L_2	Total Decel. Distance L	Clearance Distance L_1
35	70'	75'	145'	110'	— —	— —	— —
40	80'	75'	155'	120'	— —	— —	— —
45	85'	100'	185'	135'	— —	— —	— —
50	105'	135'	240'	160'	185'	290'	160'
55	125'	— —	— —	— —	225'	350'	195'
60	145'	— —	— —	— —	260'	405'	230'
65	170'	— —	— —	— —	290'	460'	270'

NOTES:

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

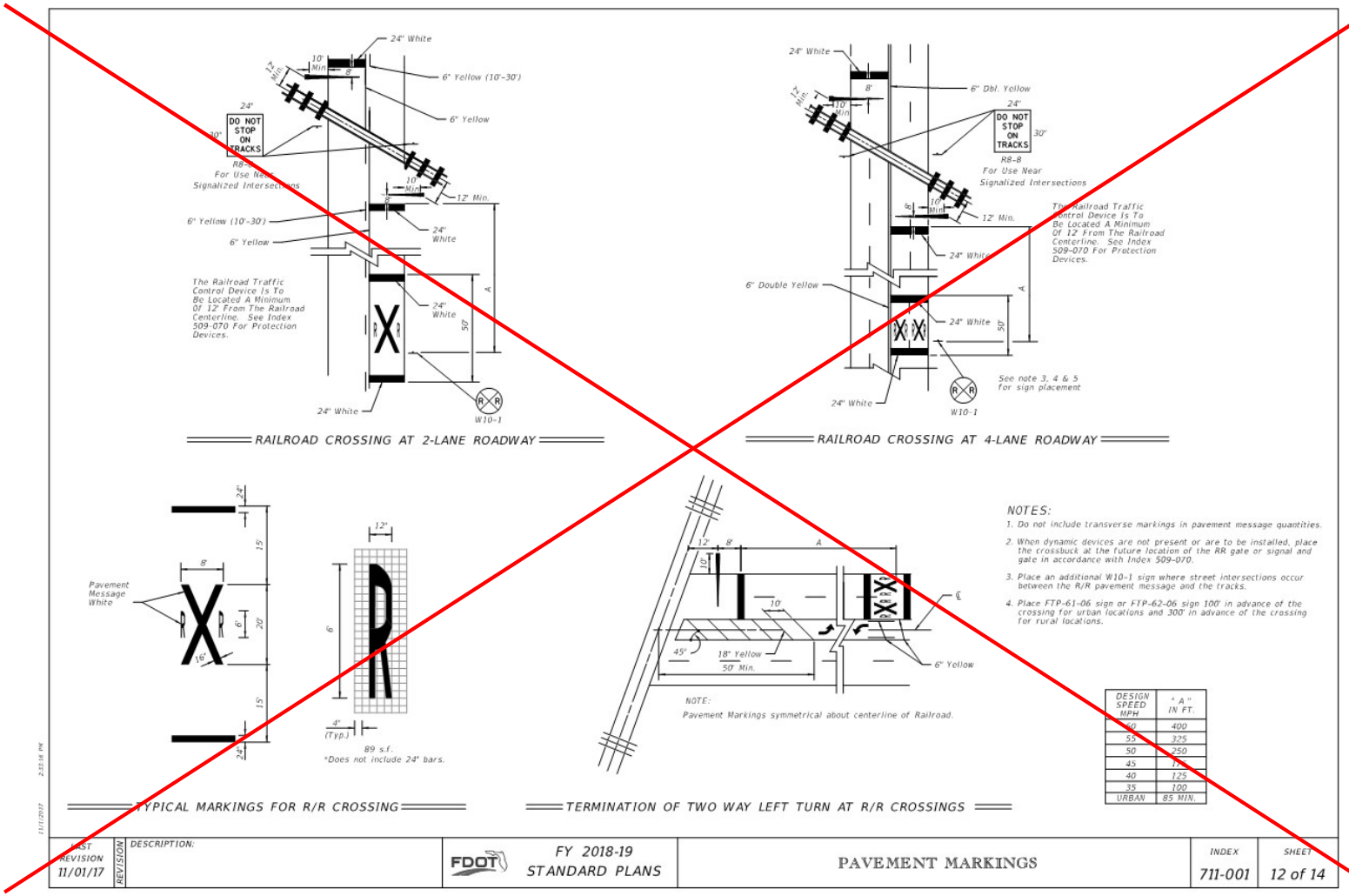
TURN LANE MARKINGS

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

Pavement Markings, Index 711-001

Old Sheet 12 of 14

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



Standard Plans – Primary Updates

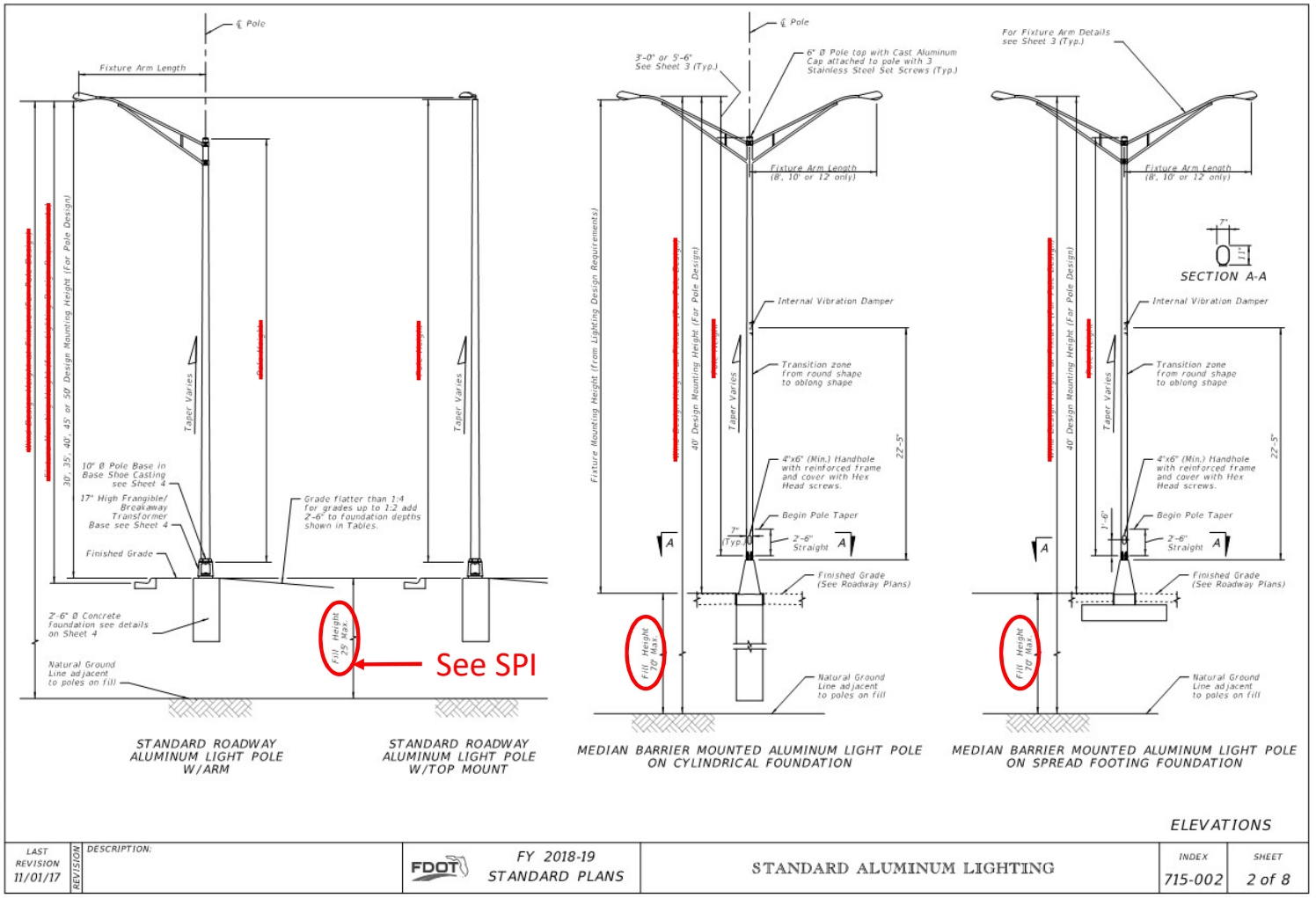
1) *Temporary Traffic Control Indexes*
2) *Signal, Signing & Pavement Marking Indexes*
3) *Lighting Indexes*
   a) *Index 715-002 – Standard Aluminum Lighting*

Standard Aluminum Lighting, Index 715-002

Sheet 2 of 8

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

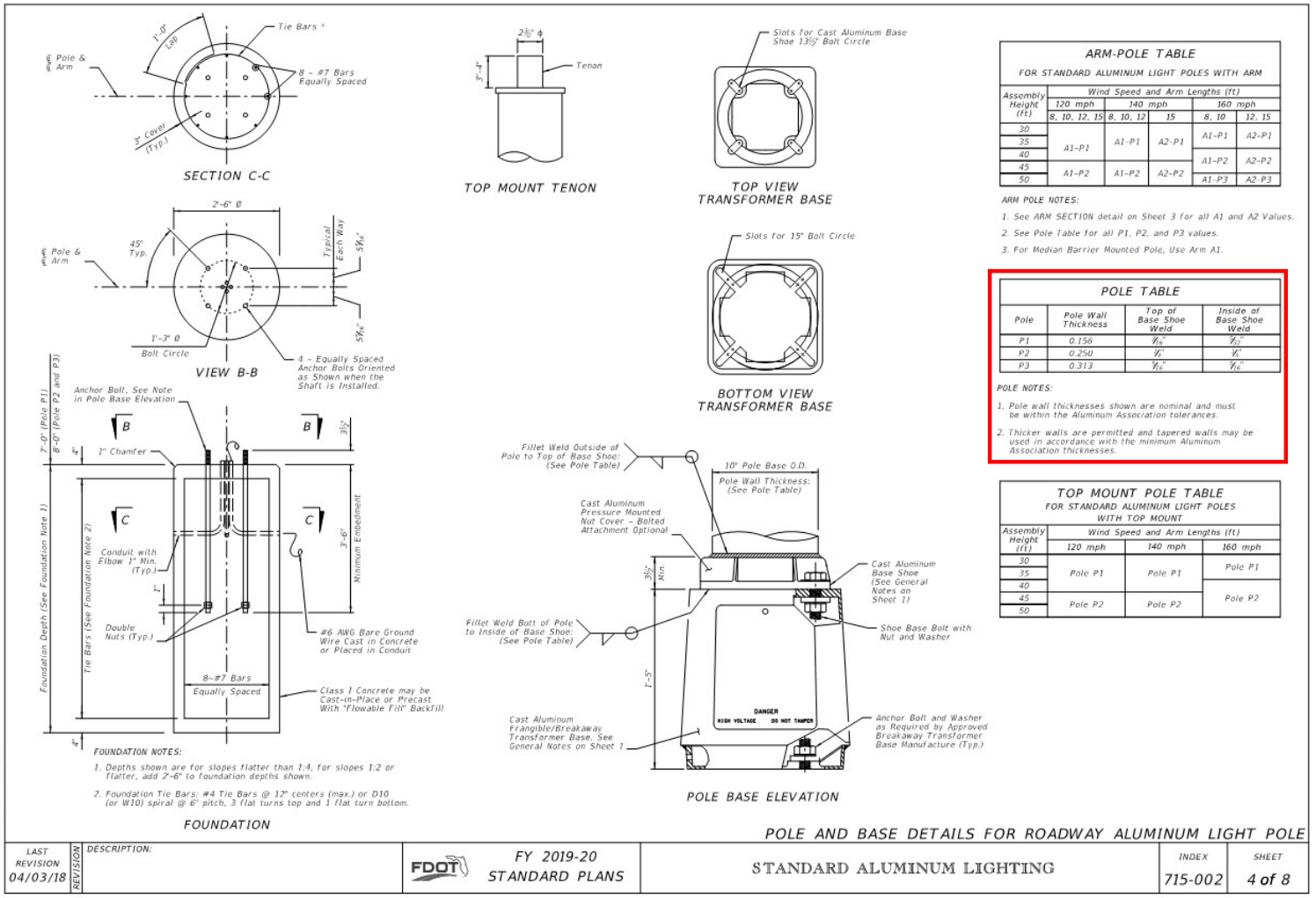
Note: The values of tables that have changed or disappeared have been reworked, when possible, into the details to which the tables applied (see sheets 3-5 of 8).



Standard Aluminum Lighting, Index 715-002

Sheet 4 of 8

Pole wall thicknesses have been revised!



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	
	8, 10, 12, 15	8, 10, 12	15	8, 10	12, 15
30	A1-P1	A1-P1	A2-P1	A1-P1	A2-P1
35					
40				A1-P2	A2-P2
45	A1-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	7/16"	7/16"
P2	0.250	1/4"	1/4"
P3	0.313	7/16"	7/16"

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	Pole P1	Pole P1
35			
40			Pole P2
45	Pole P2	Pole P2	
50			

POLE AND BASE DETAILS FOR ROADWAY ALUMINUM LIGHT POLE

LAST REVISION 04/03/18	REVISION	DESCRIPTION:	FDOT 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

Structures Design Office Updates

(December, 2018)

Cheryl Hudson, P.E.
Structures Design Standards Group
Cheryl.hudson@dot.state.fl.us
(850) 414-5332

Outline

- **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

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

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

Revision Log

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

Standard Plans

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		

Revision Log

Numerically: no separation for roadway/structures.

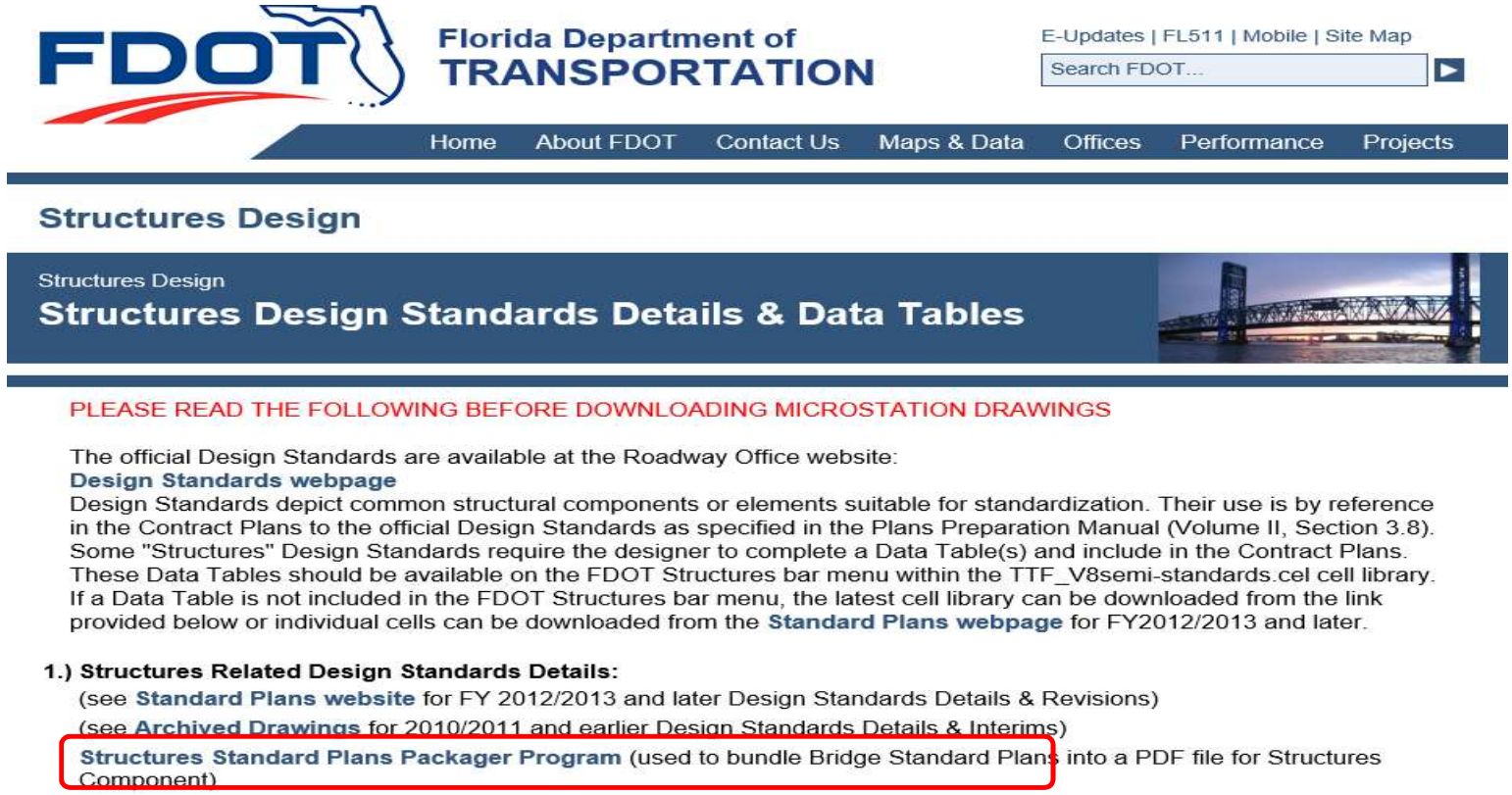
STANDARD PLANS
FY 2019-20 REVISIONS LOG

Standard Plans Index	Description
521-010	Redeveloped Standard **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. **New Sheet 2:** Added detail for terminating at 56" height barrier sections; Added detail for continuing over 44" height barrier sections.
521-422	**Sheet 1:** Changed Barrier Delineator Note. **Sheet 2:** Editorial, sidewalk hook bars.
521-423	**Sheet 1:** Changed Barrier Delineator Note. **Sheet 2:** Editorial, "RAILING END DETAIL" and "VIEW A-A AND B-B".
521-426	**Sheet 1:** Changed Barrier Delineator Note.
521-427	**Sheet 1:** Changed Barrier Delineator Note.
521-428	**Sheet 1:** Changed Barrier Delineator Note. **Sheet 2:** Editorial
521-509	**All:** Reorganized sheets and renumbered; Updated sheet # references. **Sheet 1:** Added notes moved from other sheets; Added Note 6. **Sheet 2:** Changed reinforcing. **Sheet 3:** Changed reinforcing. **Sheet 4:** Changed reinforcing. **Sheet 5:** Changed Note references to new reinforcing bars.
521-510	**All:** Reorganized sheets and renumbered; Updated sheet # references. **Sheet 1:** Added notes moved from other sheets; Added Note 6. **Sheet 2:** Changed reinforcing. **Sheet 3:** Changed reinforcing. **Sheet 4:** Changed reinforcing. **Sheet 5:** Changed Note references to new reinforcing bars.
521-511	**Sheet 1:** Updated Notes. **Sheet 2:** Added Bar 5R3; Changed reinforcing. **Sheet 3:** Added Bar 5R3; Changed reinforcing.
521-512	**Sheet 1:** Updated Notes. **Sheet 2:** Added Note 6; changed asphalt description in SECTION B-B.

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.

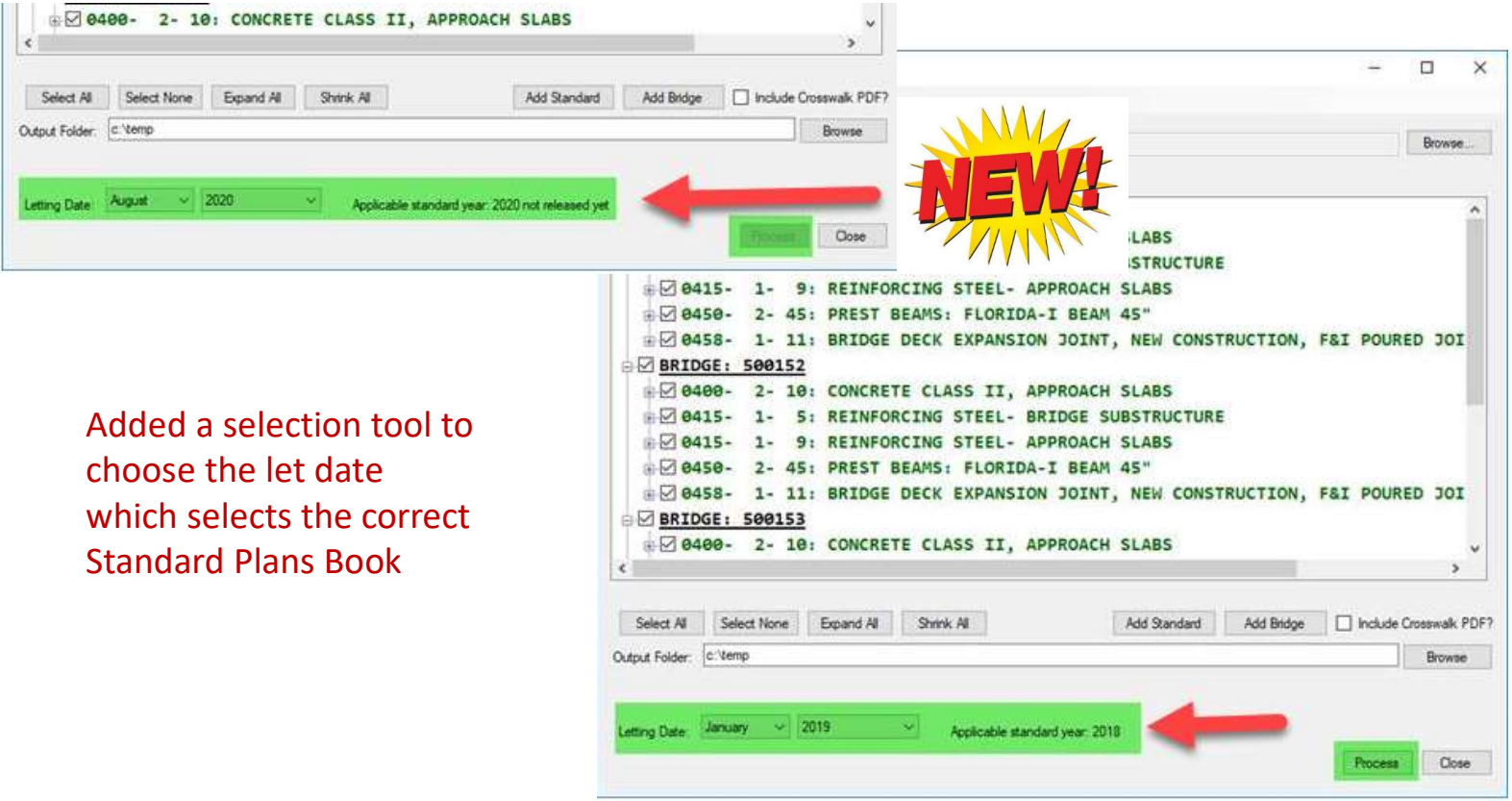
1.) Structures Related Design Standards Details:

(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

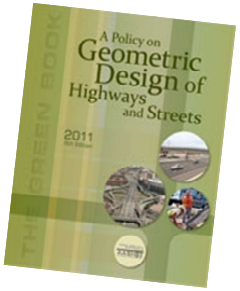
Editorial Revisions to Standard Plans

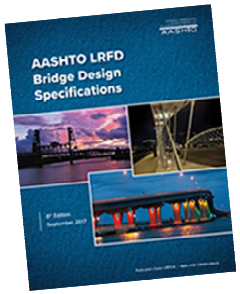
Continuing our work towards consistency - Indexes, Instructions, and Specifications.

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*





Minor Revisions to Standard Plans

- ***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.

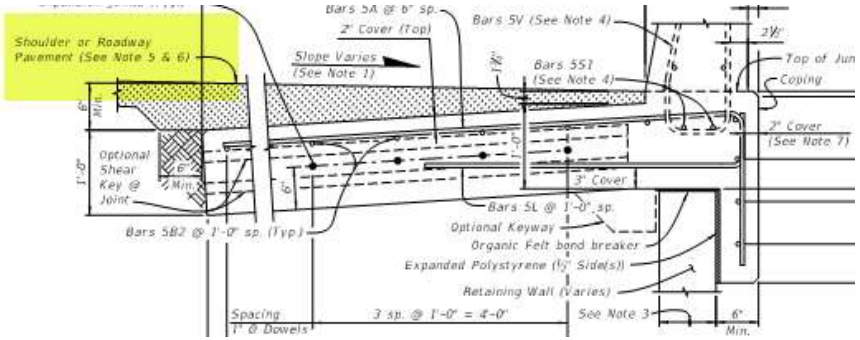
13. Holes in the beam web for temporary bracing or shipping devices must be formed prior to casting. Fill holes not meeting all the following criteria in accordance with Specification Section 450.
A. The superstructure environmental classification is slightly or moderately aggressive
B. Clear cover to 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	5¼ (2)	8	41.3
		0.6 (15.2mm)	27'-0"	3	5¼ (2)	8	42.7
	T=12 in.	0.49 (12.5mm)	31'-0"	5	3½ (1)	12	28.7
		0.5 (12.7mm)	31'-0"	3	5¼ (2)	8	41.3
		0.6 (15.2mm)	31'-0"	3	5¼ (2)	8	42.7
HSSS Strand	T=10 in.	0.5 (12.7mm)	27'-0"	5	3½ (1)	12	25.7
		0.6 (15.2mm)	26'-0"	3	5¼ (2)	8	36.5
	T=12 in.	0.5 (12.7mm)	32'-0"	6	2¾ (3)	14	25.7
		0.6 (15.2mm)	32'-0"	4	4	10	36.5

Concrete Sheet Pile Table was Changed

Minor Revisions (Cont.)

- ***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.*

Minor Revisions (Cont.)

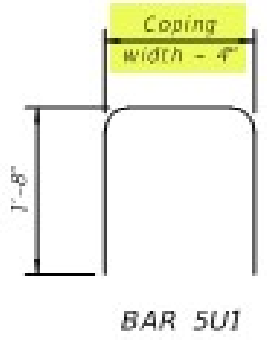
- ***Index 515-052 & 515-062:*** *Pedestrian/Bicycle Railings*
  - *Corrected specification reference.*

- ***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 +*

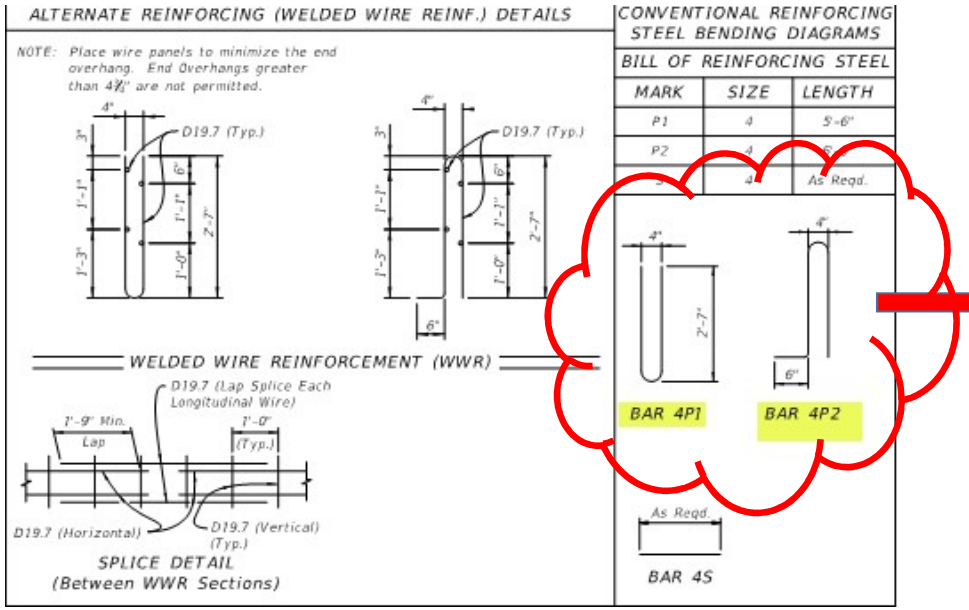
7. For Bullet Railings, see Index 515-821 and 515-822.
8. Begin placing Railing Bars 5T and 5X at the railing end and proceed toward Retaining Wall to avoid conflict with guardrail bolt holes. If required, adjustments to the bar spacing for Bars 5T and 5X shall be made immediately adjacent to Begin or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

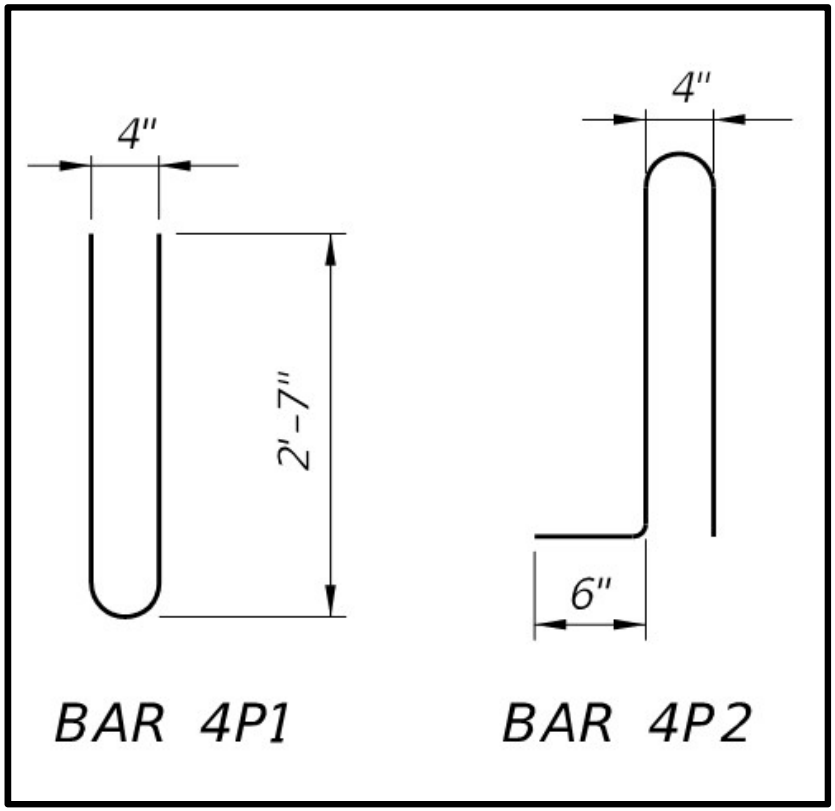


- ***Index 521-630:*** *Parapet with C-I-P Sidewalk – Wall Coping*
  - *Sheet 2: Corrected Bar 5U dimension*

Minor Revisions (Cont.)

- ***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.*





Minor Revisions (Cont.)

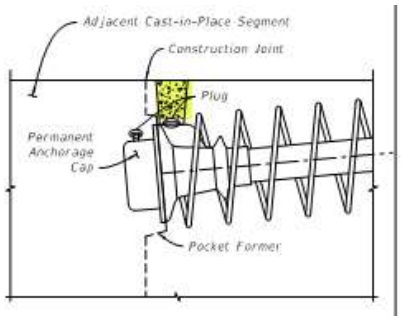
- ***Index 534-250:*** *Perimeter Walls*
  - *Changed the Grout strength for ACP to match the Noise Walls*
  - *Issued as an* ***ERRATA*** *earlier this year*

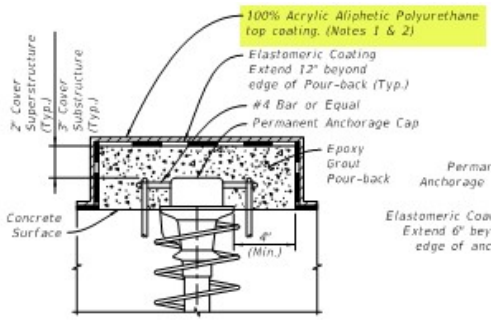
- ***Index 630-010:*** *Conduit Details – Embedded*
  - *Clarified that EJB "A" is for double or triple conduit.*

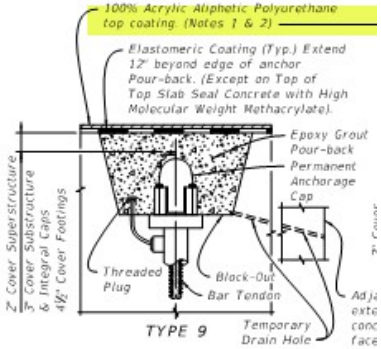
MAJOR REVISIONS

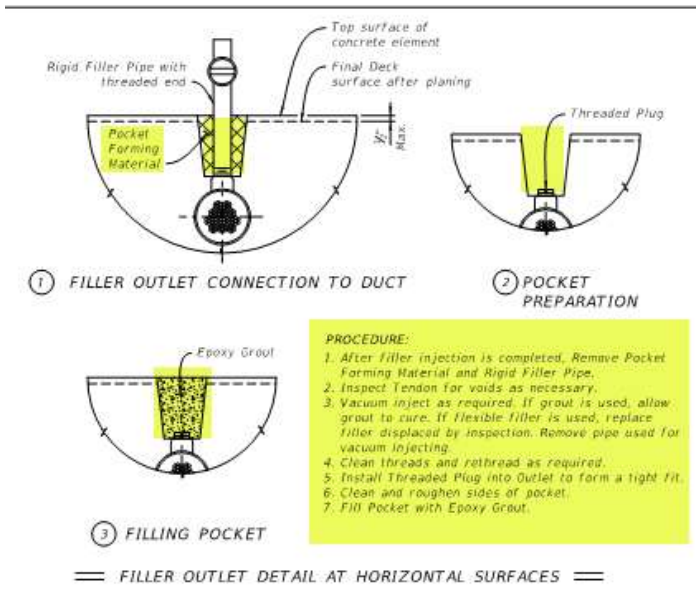
Major Revisions to Standard Plans

- ***Index 462-002 & 462-003: Post Tensioning Details***
  - *Added Pockets around Plugs for constructability*
  - *Added polyurethane top coating to drawings (specification requirement)*







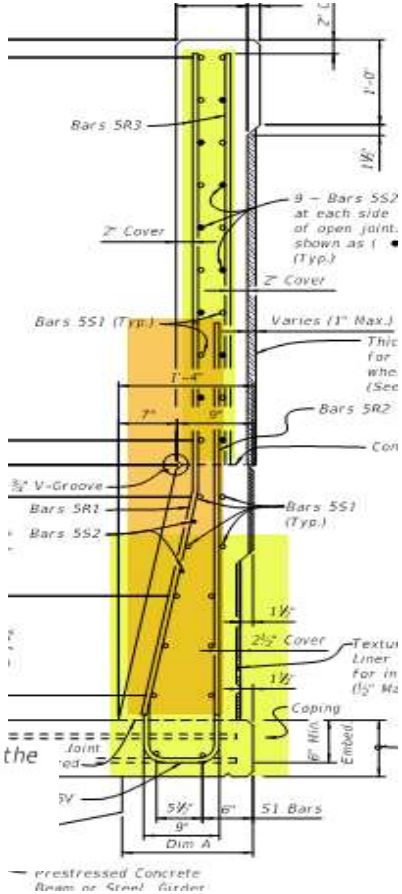


Major Revisions (Cont.)

- ***521-509, 510, 511:*** *Traffic Railing/Concrete Barrier/Noise Walls*
  - *Reorganized Sheets & Notes (Moved Notes to Sheet 1)*
    - ***Read notes carefully, too many small changes to note.***

- ***521-509, 510, 511:*** *Traffic Railing/Concrete Barrier/Noise Walls*
  - *Added Slip forming information*
  - *Reinforcing re-designed for constructability (three pours).*

5. Install Barrier Delineators 2'-4" above the riding surface in accordance with Specification Section 705. Match the Barrier Delineators color (White or Yellow) to the near edgeline.
6. Slip forming of the barrier portion is permitted.
   A. Stem walls may be widened, at no additional cost, to accomodate slip forming.

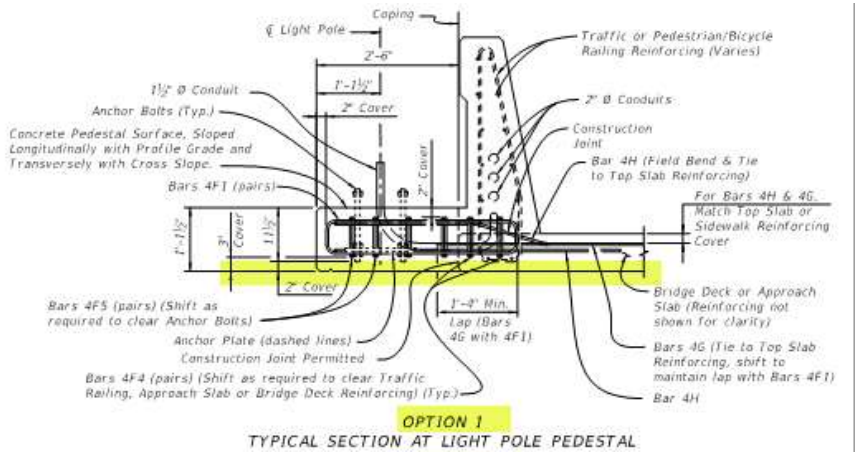


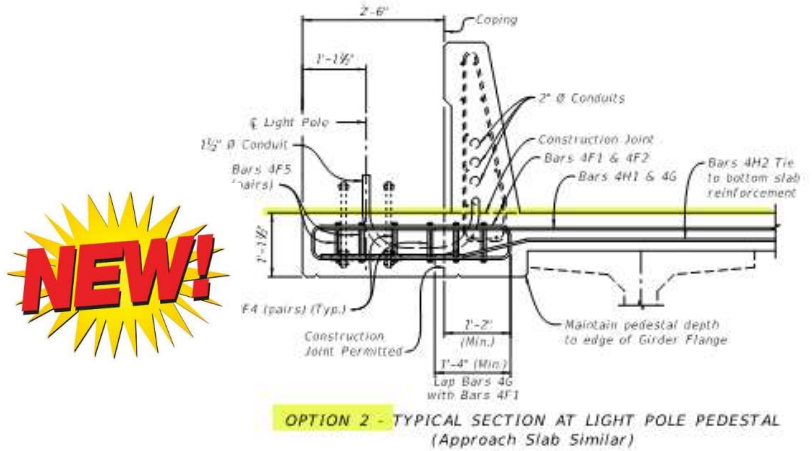
Major Revisions (Cont.)

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.*

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)

Developmental Standards & Looking Ahead

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

Send us Your Ideas

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**

Questions

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

Questions

- **Who do you call?**

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