FY 2017-18 Design Standards
Update Training

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Update Training Agenda

- Changes/Overview in General Process
- Design Standards Updates
  - **Derwood Sheppard**
    105, 200 Series, 300 Series, 410, 414, 500, 505, 514, 515, 516, 525, 530, 546, 700, 11862, 17349, 17354 & 17882
  - **Richard Stepp**
    Guardrail - Indexes 400 & 402
  - **Ashley Binder**
    Landscape - New Index 542 & Index 544
  - **Ed Cashman**
    Maintenance of Traffic (MOT) – Index 600
    Pavement Markings – Index 17346
  - **Charlie Harvey**
    AASHTO Wind Loading Index Changes
  - **Steve Nolan**
    Bridge/Ped. Railings, Walls, and Bridge Structures

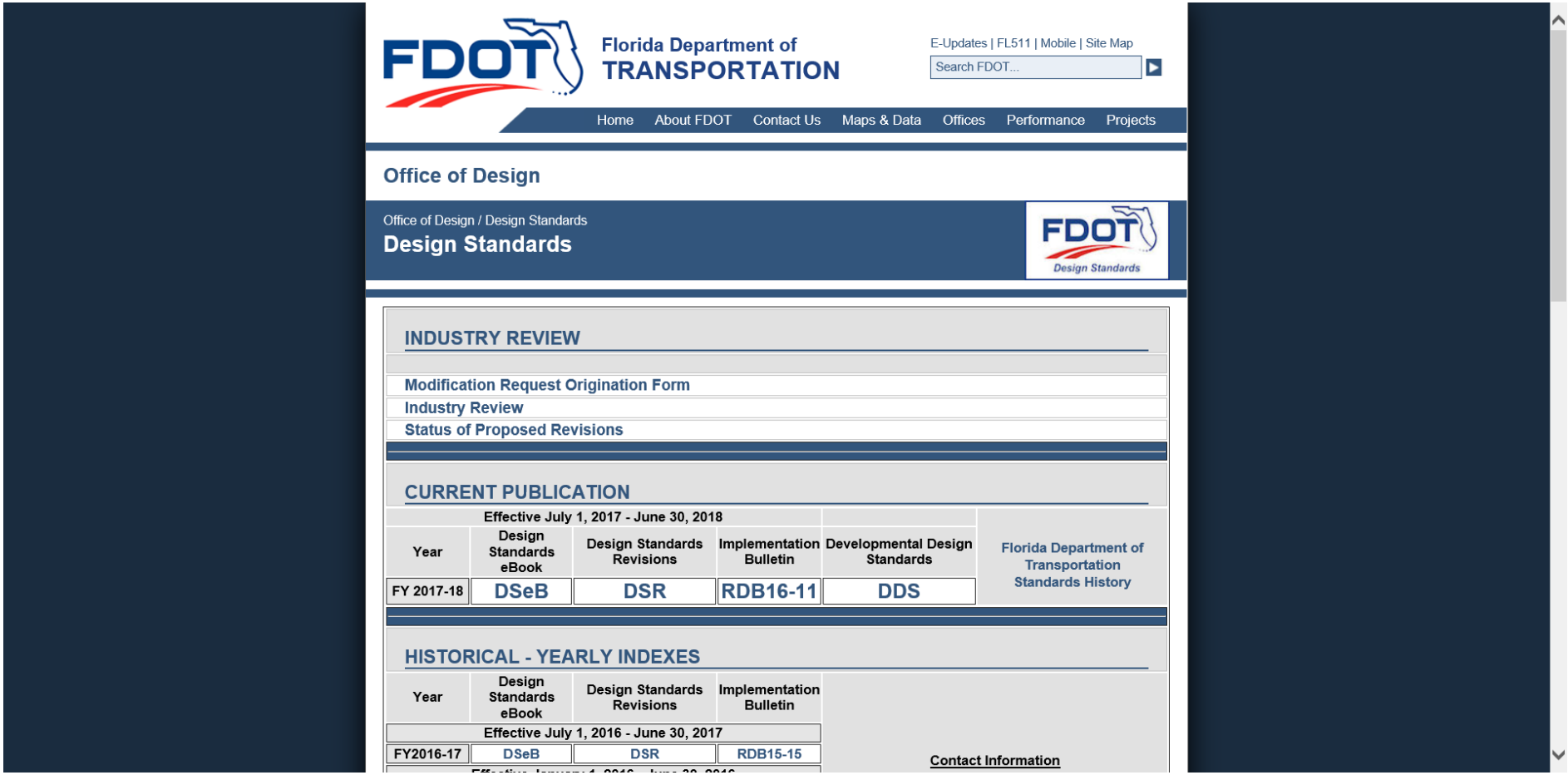
Design Standards – General Process

- eBook Access
  http://www.fdot.gov/roadway/DesignStandards/Standards.shtm
- Training
- Revisions Log
- Errata
- Design Standards Revisions (DSR) - No Longer Attached to Plans
- Instructions for Design Standards (IDS)
- Design Tools
- DGN's (Terms of Use)

Design Standards – General Process

- eBook Access

  http://www.fdot.gov/roadway/DesignStandards/Standards.shtm



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Design Standards

INDUSTRY REVIEW

Modification Request Origination Form

Industry Review

Status of Proposed Revisions

CURRENT PUBLICATION

Effective July 1, 2017 - June 30, 2018

Year	Design Standards eBook	Design Standards Revisions	Implementation Bulletin	Developmental Design Standards
FY 2017-18	DSeB	DSR	RDB16-11	DDS

Florida Department of Transportation Standards History

HISTORICAL - YEARLY INDEXES

Year	Design Standards eBook	Design Standards Revisions	Implementation Bulletin
Effective July 1, 2016 - June 30, 2017			
FY2016-17	DSeB	DSR	RDB15-15

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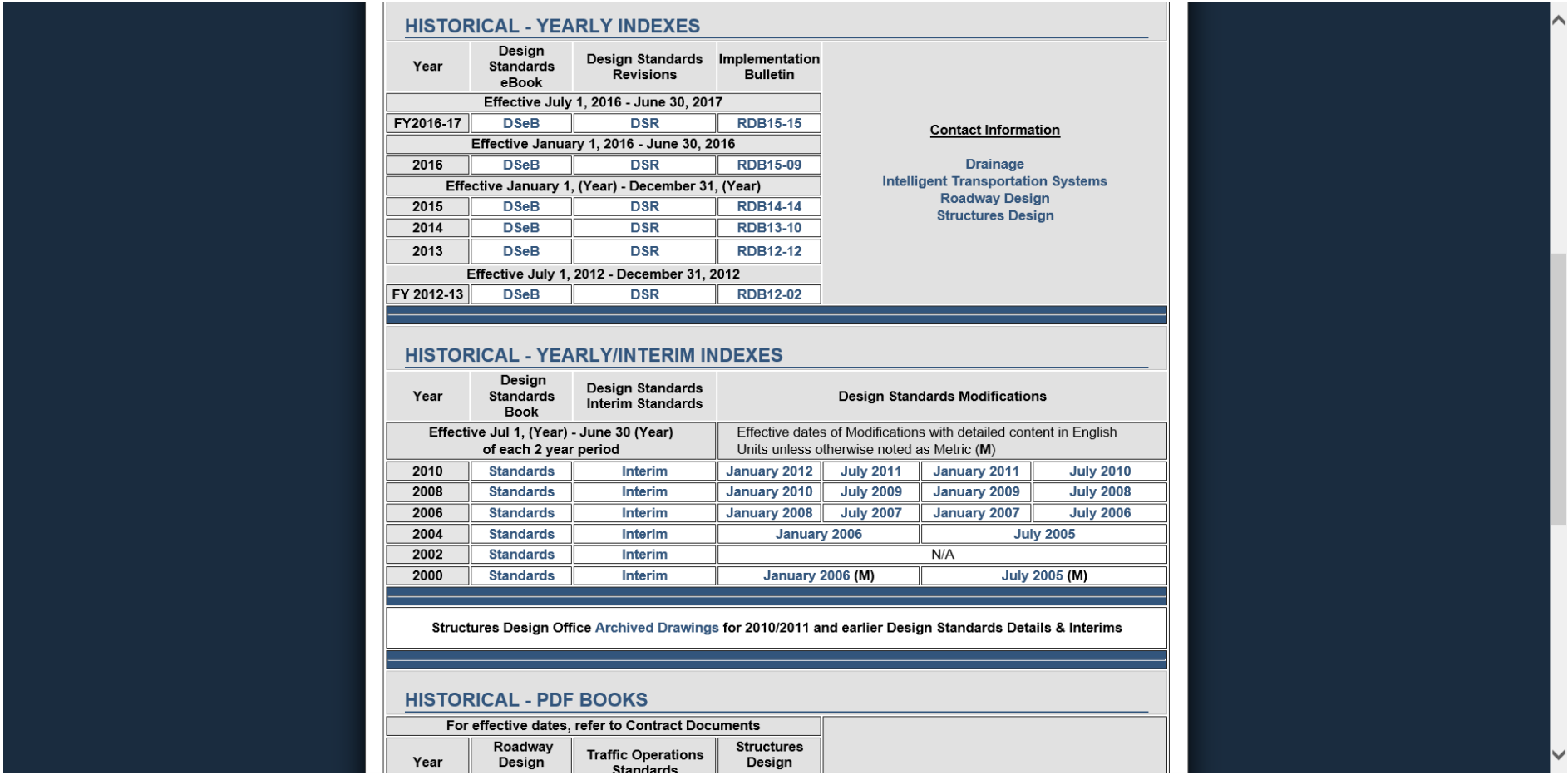

HISTORICAL - YEARLY INDEXES

Year	Design Standards eBook	Design Standards Revisions	Implementation Bulletin
Effective July 1, 2016 - June 30, 2017			
FY2016-17	DSeB	DSR	RDB15-15
Effective January 1, 2016 - June 30, 2016			
2016	DSeB	DSR	RDB15-09
Effective January 1, (Year) - December 31, (Year)			
2015	DSeB	DSR	RDB14-14
2014	DSeB	DSR	RDB13-10
2013	DSeB	DSR	RDB12-12
Effective July 1, 2012 - December 31, 2012			
FY 2012-13	DSeB	DSR	RDB12-02

Contact Information

Drainage
Intelligent Transportation Systems
Roadway Design
Structures Design

HISTORICAL - YEARLY/INTERIM INDEXES

Year	Design Standards Book	Design Standards Interim Standards	Design Standards Modifications			
Effective Jul 1, (Year) - June 30 (Year) of each 2 year period			Effective dates of Modifications with detailed content in English Units unless otherwise noted as Metric (**M**)			
2010	Standards	Interim	January 2012	July 2011	January 2011	July 2010
2008	Standards	Interim	January 2010	July 2009	January 2009	July 2008
2006	Standards	Interim	January 2008	July 2007	January 2007	July 2006
2004	Standards	Interim	January 2006		July 2005	
2002	Standards	Interim	N/A			
2000	Standards	Interim	January 2006 (**M**)		July 2005 (**M**)	

Structures Design Office Archived Drawings for 2010/2011 and earlier Design Standards Details & Interims

HISTORICAL - PDF BOOKS

For effective dates, refer to Contract Documents			
Year	Roadway Design	Traffic Operations Standards	Structures Design

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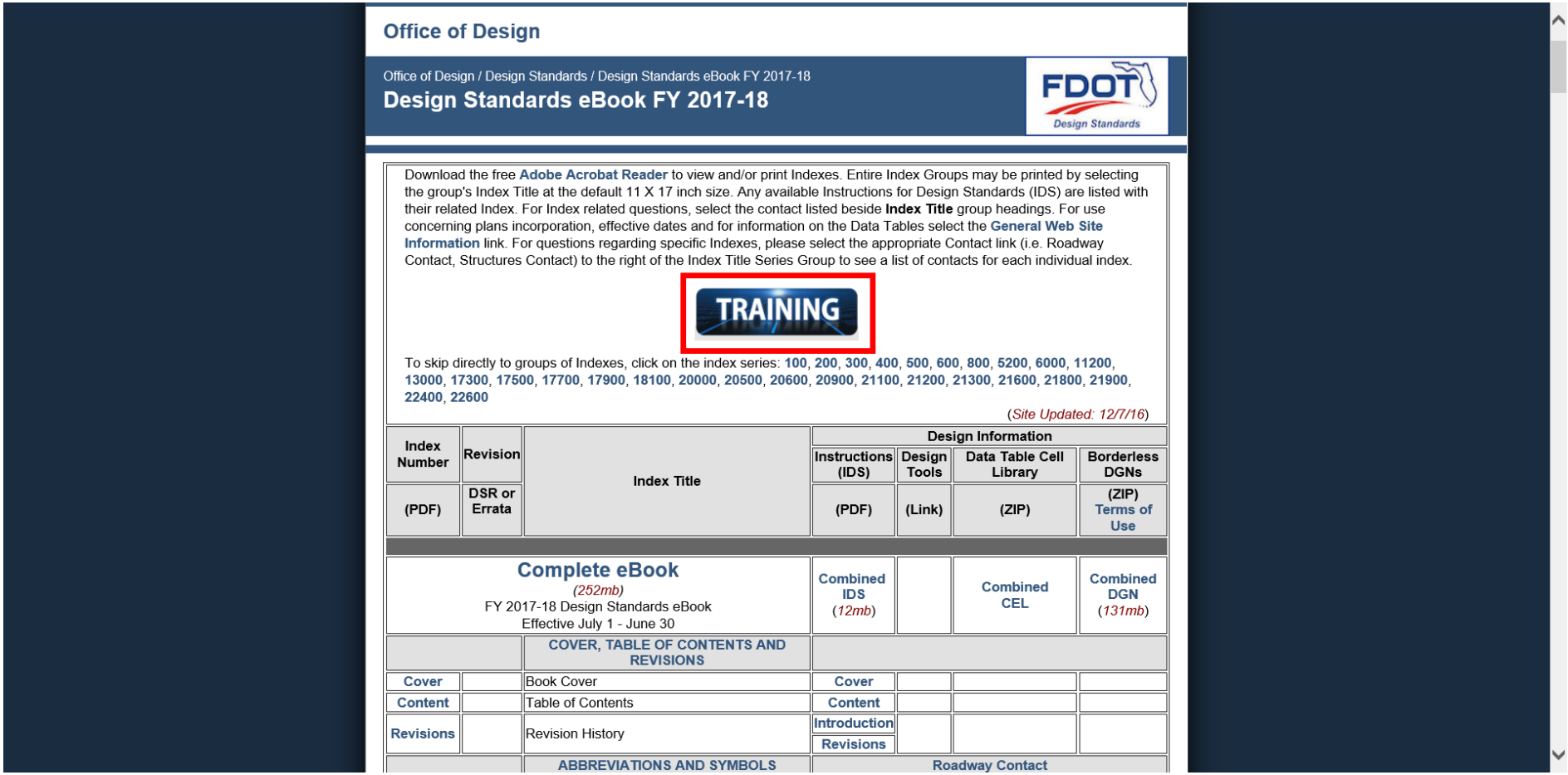
- Training



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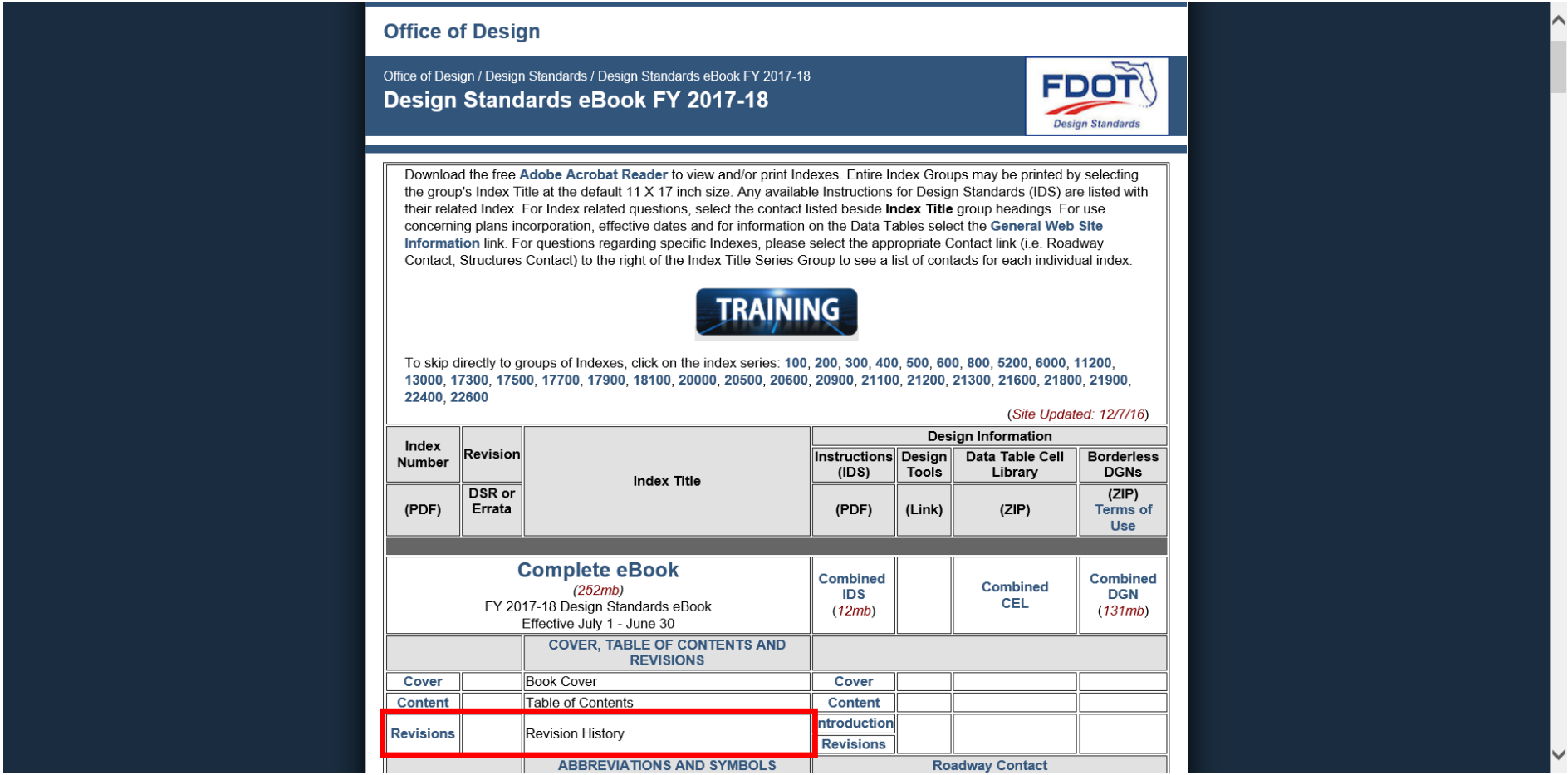
		COVER, TABLE OF CONTENTS AND REVISIONS				
Cover		Book Cover	Cover			
Content		Table of Contents	Content			
Revisions		Revision History	Introduction Revisions			
		ABBREVIATIONS AND SYMBOLS	Roadway Contact			

Design Standards – General Process

- Revisions History (Log)



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		ABBREVIATIONS AND SYMBOLS	Roadway Contact			

Design Standards – General Process

- Revisions History (Log)

FY 2017-18 REVISIONS

Index	Sheet No.	Description
Standard Abbreviations		
1	2 of 4	Added FSB = Florida Slab Beam.
	3 of 4	Added PBR = Pedestrian/Bicycle Railing.
	4 of 4	Added SHBR = Special Height Bicycle Railing.
Erosion Control and Water Quality		
105	1 of 1	Changed General Notes # 1.A and 3; Changed the 1" Dorp-Off call outs to Drop-Off (1/2" Min., 1" Max); Changed General Notes # 1.B, 2.B, 2.C and 2.D reference from "Finished Soil Layer" to "Prepared Soil Layer".
Drainage		
200 Series	All	Changed "Location Reference" to "Sta./Offset Location"; Added "Sta./Offset Location" as needed.
200	2 of 5	Updated TABLE 1 NOTES
	4 of 5	Changed SLAB AND WALL DESIGN TABLE NOTE 9.
201	4 of 5	Changed General Note #1; Corrected Notes For Precast: last paragraph D3.1 to D4.0.
206	1 of 2	Deleted General Note #8, as this appears in the specs.
216	1 of 2	Changed the dimension 1'-4 1/2" to 1'-5 1/2" and In Section B-B, changed the dimension 1'-9" to 1'-10"; Added Callout for #5 Bars In Section B-B.
217	1 of 2	Added Note #10 updated bond breaker references to correctly call upon ASTM D6380 Class S, Type III organic felt.
218	1 of 2	Change Roofing Paper to ASTM D6380 Class S, Type III organic felt.
250	1 of 2	Changed Horizontal Clearance to Lateral Offest.
260	1 of 1	Updated Note 2: Lap length updated per AASHTO.
272	6 of 6	Changed the GENERAL NOTES.
273	6 of 6	Changed the GENERAL NOTES.
280	2 of 3	Changed the Note for the GUARD AT PIPE ENDS detail to remove payment information.
289	1 of 8	Updated Lap Splice lengths in Table 1 per AASHTO-BDS 2015 Interim.
295	1 of 1	Changed Note 4, Lap length per AASHTO-BDS 2015 Interim, from 12" minimum to 1'-5" minimum and "clearance" to "cover".

Index	Sheet No.	Description
Curbs, Concrete Pavement and Sidewalks		
304	All	Updated Index to remove Criteria information. Additional updates made to clarify Issues with location of Detectable Warnings.
307	1 of 3	Updated notes for clarification.
	2 of 3	Updated and reorganized sheet for clarification.
	3 of 3	Deleted Plan View; Updated minimum cut line offset from 4' to 1'.
310	All	Reorganized sheets, Updated Notes to show 6" Thick Concrete at the Turnouts and Curb Ramps.
Traffic Railings		
400	1 of 22	Added note explaining usage of Approach Transition Connection to Rigid Barrier for new conditions only and add references to Index 402 for existing conflicting conditions. Explain that Miscellaneous Asphalt Pavement has a thickness tolerance of plus or minus a half inch. (to avoid excessively thick installations).
	2 of 22	Added note explaining where Splice Ridge goes when reverse laning is used.
	3 of 22	Deleted items from Note 8 that the TL-2 Guardrail would not be compatable with. Added note explaining where Splice Ridge goes when reverse laning is used.
	4 of 22	Added option for 3/4" bracket holes to match splice slot size in the panel.
	8 of 22	Clarified 1:10 grading on each side of Double Faced terminals and how to transition grade outside of 'LE'.
	13 & 14 of 22	Clarified how the face of guardrail aligns with the face of the Rigid Barrier (4" behind original toe of barrier for F-Shape).
	15 of 22	Added callout for gauge of Thrie-Beam Terminal connector.
	16 of 22	Changed Note 1.
	17 of 22	Added reference to Index 402 for existing layouts.
	20 of 22	Changed Note 2 -Pipe Rail Should be excluded from segment 'LA' as well.
	22 of 22	Updated Barrier Delineator Spacing.
402	1A, 1B & 1C of 24	Added previous Index 400 layouts that support Index 402.
	1, 23 & 24 of 24	Updated Sheets for compatibility with New Index 400.
	23 of 24	Clarified how to handle trailing guardrail transition connections.
405	5 & 6 of 6	Changed 30 lb smooth roofing paper to Organic Felt bond breaker along joint.

Index	Sheet No.	Description
Traffic Railings		
410	1 of 25	Changed the >8' Spacing to 100' in the BARRIER DELINEATOR SPACING FOR CONCRETE BARRIER WALLS table.
	11 of 25	Changed "Roofing Felt" to "Organic Felt" ASTM D226 in Note 1.
414	All	Clarified Barrier Delineators between 410, 414 and 415. Revised Misc. Asphalt Pad requirements.
	1 of 15	Update REINFORCING STEEL note reference to cold galvanizing from Spec 975 to 562.
415	All	Clarified Barrier Delineators between 410, 414 and 415. Revised Misc. Asphalt Pad requirements.
	1 of 7	Changed Note #4, Changed Note #8, barrier delineators are to be spaced at 40' and 80' on all other locations.
	1, 4, 6 & 7 of 7	Clarified Misc. Asphalt Pad requirements.
	7 of 7	Updated Note 1.
420	1 & 2 of 4	Updated guardrail connection details per Index 400.
	4 of 4	Change splice length per AASHTO-BDS 2015 Interim.
421	1 & 2 of 4	Changed guardrail connections to match updated Index 400 (15'-0" overlap).
	4 of 4	Changed reinforcing splice length per AASHTO-BDS 2015 Interim.
422	1 & 2 of 3	Changed guardrail connection to match updated Index 400.
423	1 & 2 of 3	Changed guardrail connection to match updated Index 400.
424	2 of 7	Changed guardrail connection to match updated Index 400.
	5 of 7	Changed Note 4, Updated splice lengths per AASHTO BDS 2015 Interim.
425	1 & 2 of 3	Changed guardrail connection to match updated Index 400.
	2 & 3 of 3	Updated Lap Splice lengths per AASHTO-BDS 2015 Interim.
426	All	New Index.
427	All	New Index.
428	All	New Index.
471	4 of 4	Changed 30 lb smooth roofing paper to Organic Felt bond breaker.
480	2 of 2	Changed lap splice length per AASHTO-BDS 2015 Interim.
482	3 & 4 of 4	Changed 30 lb smooth roofing paper to Organic Felt bond breaker.
484	7 & 10 of 10	Changed 2 layers of 30 lb smooth roofing paper to Organic Felt bond breaker.

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- Errata
- Design Standards Revisions (DSR) - No Longer Attached to Plans

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255		Straight Concrete Endwalls - Single 84" Pipe				DGN
258		Straight Sand - Cement Endwalls				DGN
260		U-Type Concrete Endwalls With Grates - 15" to 30" Pipe				DGN
261	Errata	U-Type Concrete Endwalls - Baffles and Grate Optional - 15" to 30" Pipe				DGN
264		U-Type Concrete Endwall - Energy Dissipator - 30" to 72" Pipe				DGN
266		Winged Concrete Endwalls - Single Round Pipe				DGN
268		U-Type Sand-Cement Endwalls				DGN

Only the Errata Will be Provided

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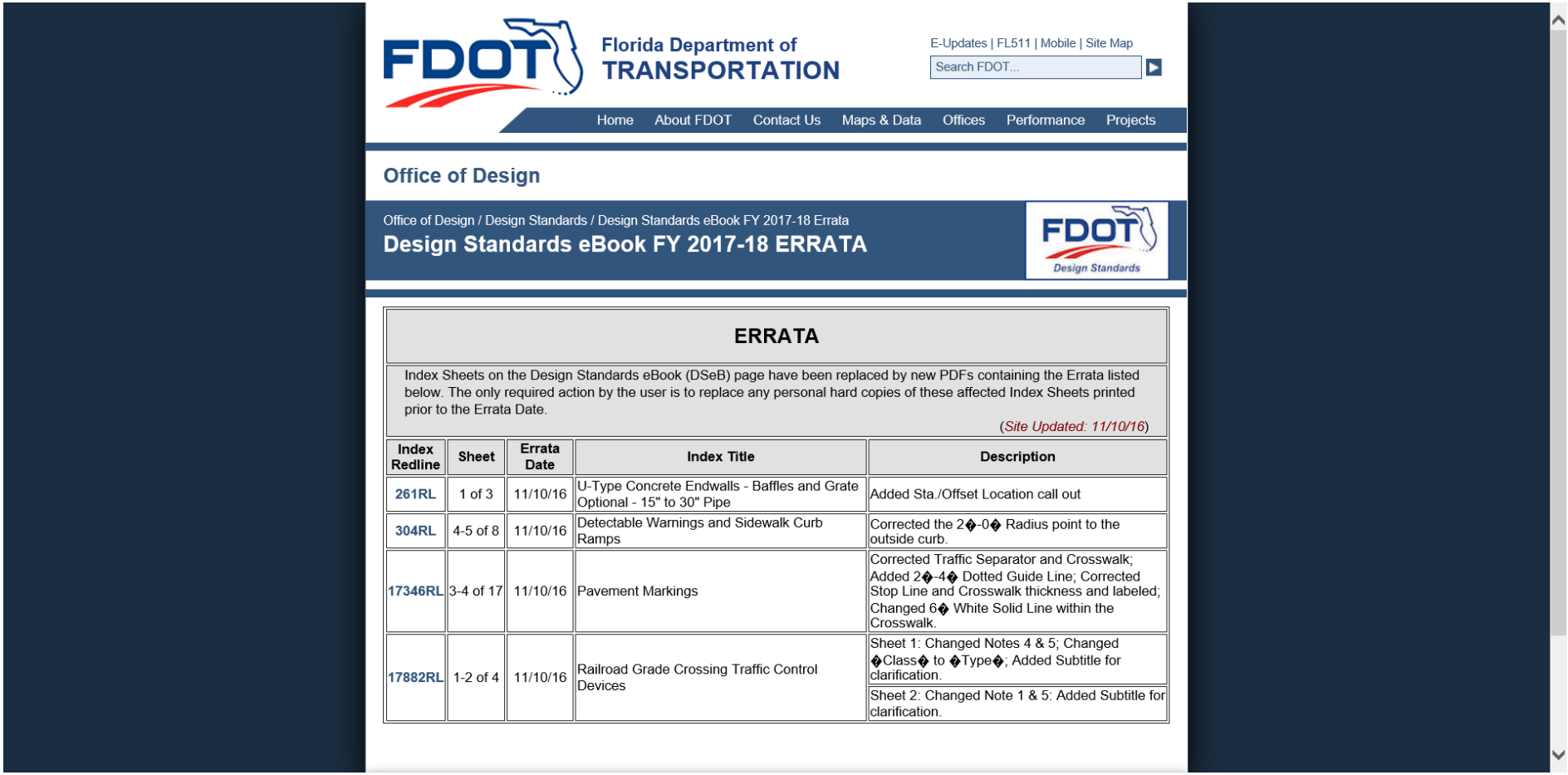

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FDOT Design Standards

ERRATA

Index Sheets on the Design Standards eBook (DSeB) page have been replaced by new PDFs containing the Errata listed below. The only required action by the user is to replace any personal hard copies of these affected Index Sheets printed prior to the Errata Date.

(*Site Updated: 11/10/16*)

Index Redline	Sheet	Errata Date	Index Title	Description
261RL	1 of 3	11/10/16	U-Type Concrete Endwalls - Baffles and Grate Optional - 15" to 30" Pipe	Added Sta./Offset Location call out
304RL	4-5 of 8	11/10/16	Detectable Warnings and Sidewalk Curb Ramps	Corrected the 2�-0� Radius point to the outside curb.
17346RL	3-4 of 17	11/10/16	Pavement Markings	Corrected Traffic Separator and Crosswalk; Added 2�-4� Dotted Guide Line; Corrected Stop Line and Crosswalk thickness and labeled; Changed 6� White Solid Line within the Crosswalk.
17882RL	1-2 of 4	11/10/16	Railroad Grade Crossing Traffic Control Devices	Sheet 1: Changed Notes 4 & 5; Changed �Class� to �Type�; Added Subtitle for clarification.
				Sheet 2: Changed Note 1 & 5: Added Subtitle for clarification.

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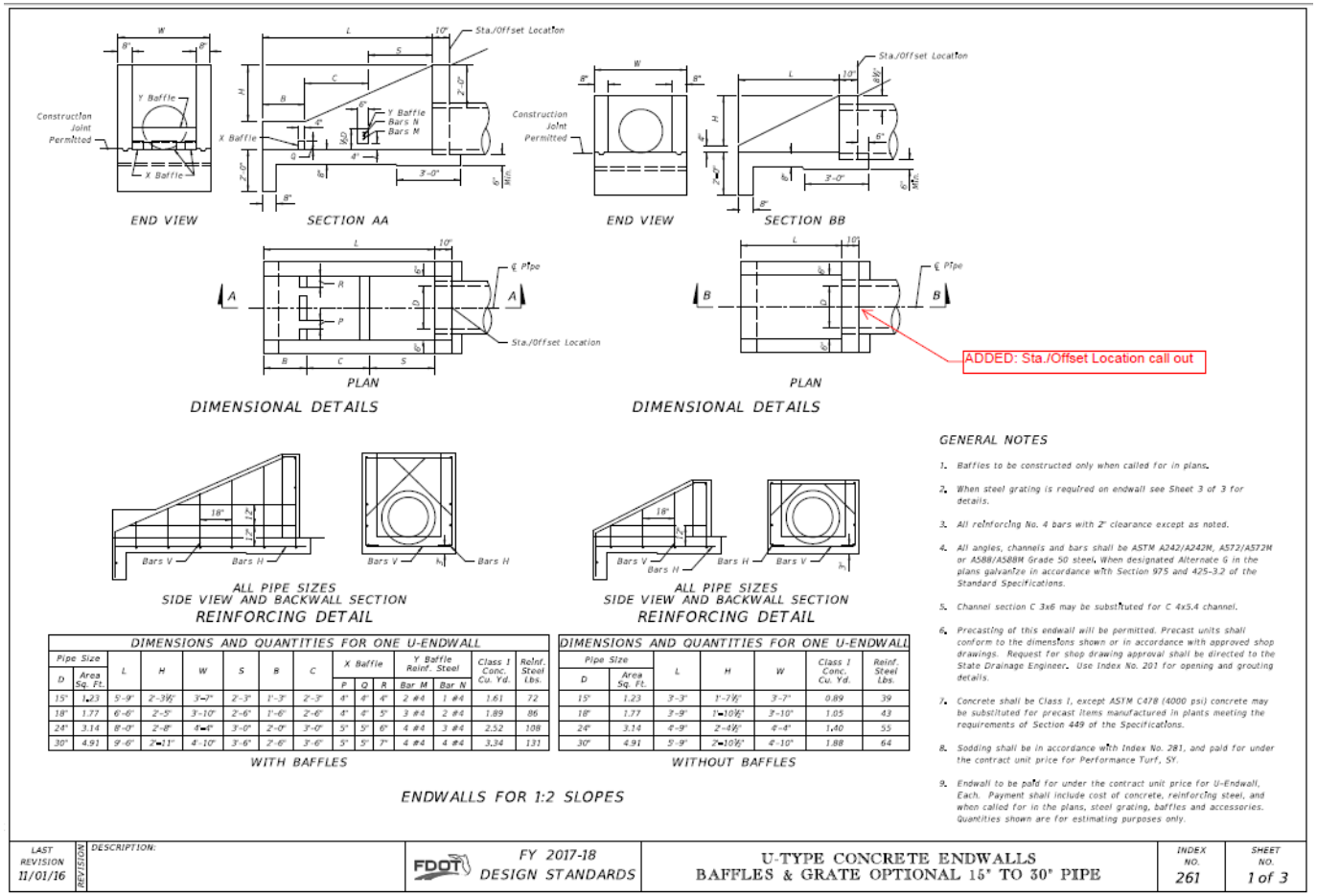

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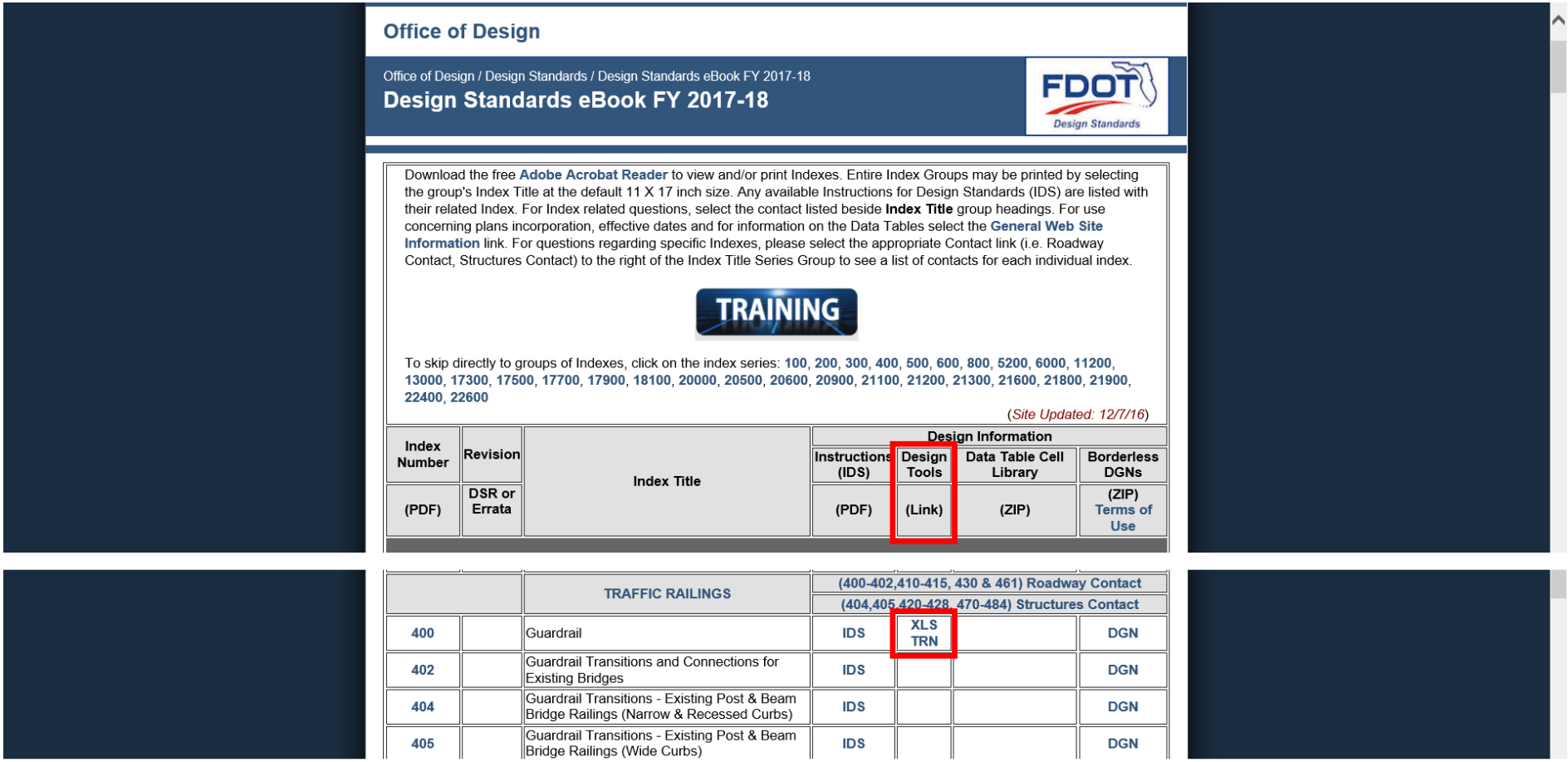

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		TRAFFIC RAILINGS	(400-402,410-415, 430 & 461) Roadway Contact (404,405,420-428, 470-484) Structures Contact			
400		Guardrail	IDS	XLS TRN		DGN
402		Guardrail Transitions and Connections for Existing Bridges	IDS			DGN
404		Guardrail Transitions - Existing Post & Beam Bridge Railings (Narrow & Recessed Curbs)	IDS			DGN
405		Guardrail Transitions - Existing Post & Beam Bridge Railings (Wide Curbs)	IDS			DGN

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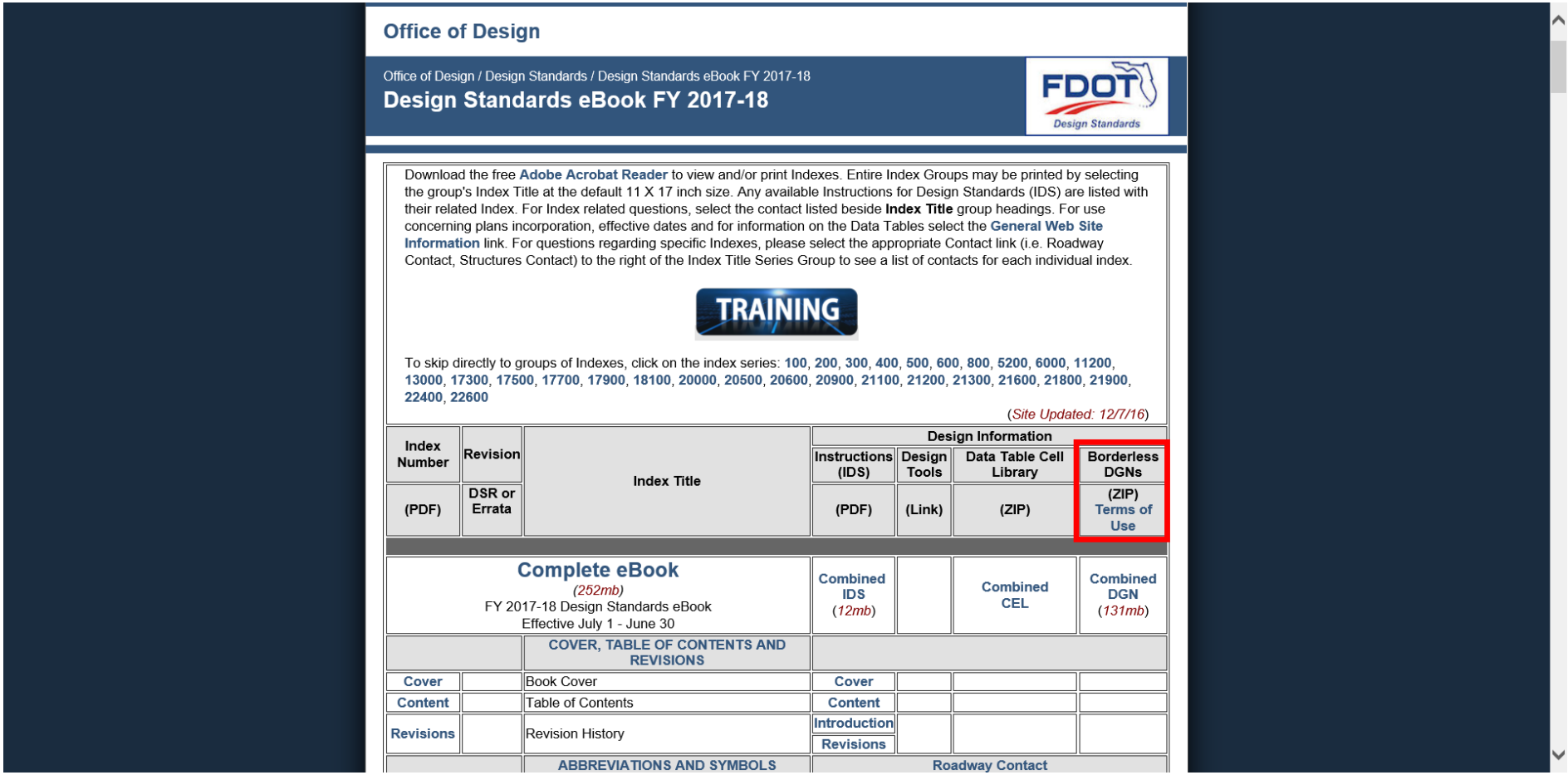

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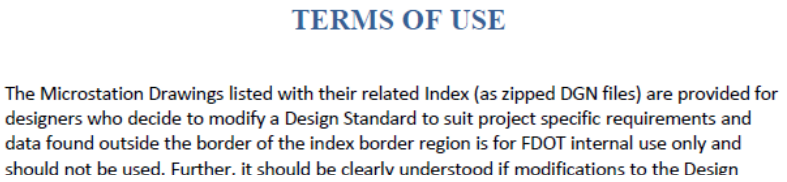

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The Microstation Drawings listed with their related Index (as zipped DGN files) are provided for designers who decide to modify a Design Standard to suit project specific requirements and data found outside the border of the index border region is for FDOT internal use only and should not be used. Further, it should be clearly understood if modifications to the Design

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Method 1:

Produce a new project specific drawing using the details within the Microstation Drawing as a guide or template. In this event, no reference to the related Design Standard will be called out in the plans. The details in the plans which were created from the Microstation drawing cease to be a standard and the engineer responsible for the modifications to the drawings becomes the EOR for the application of the entire system.

responsible for the modifications to the drawings becomes the EOR. Use one of the following methods:

Method 3:

If the required modifications are minor, use the Microstation drawing to create details showing the modifications to the Design Standard on a separate sheet in the plans. In this event, reference the related Design Standard in the plans. Place the modified details in the plans on a sheet entitled, "Modifications to Design Standards Index XXXX". The engineer responsible for the modifications to the Design Standard becomes the EOR for the details on this sheet and for all effects the modification has on other components within the Design Standard.

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Design Standards – Index Updates

1) ***Index 105*** - Shoulder Sodding and Turf on Existing Facilities
   - Changed Allowable Drop-off to Range of ½" to 1"

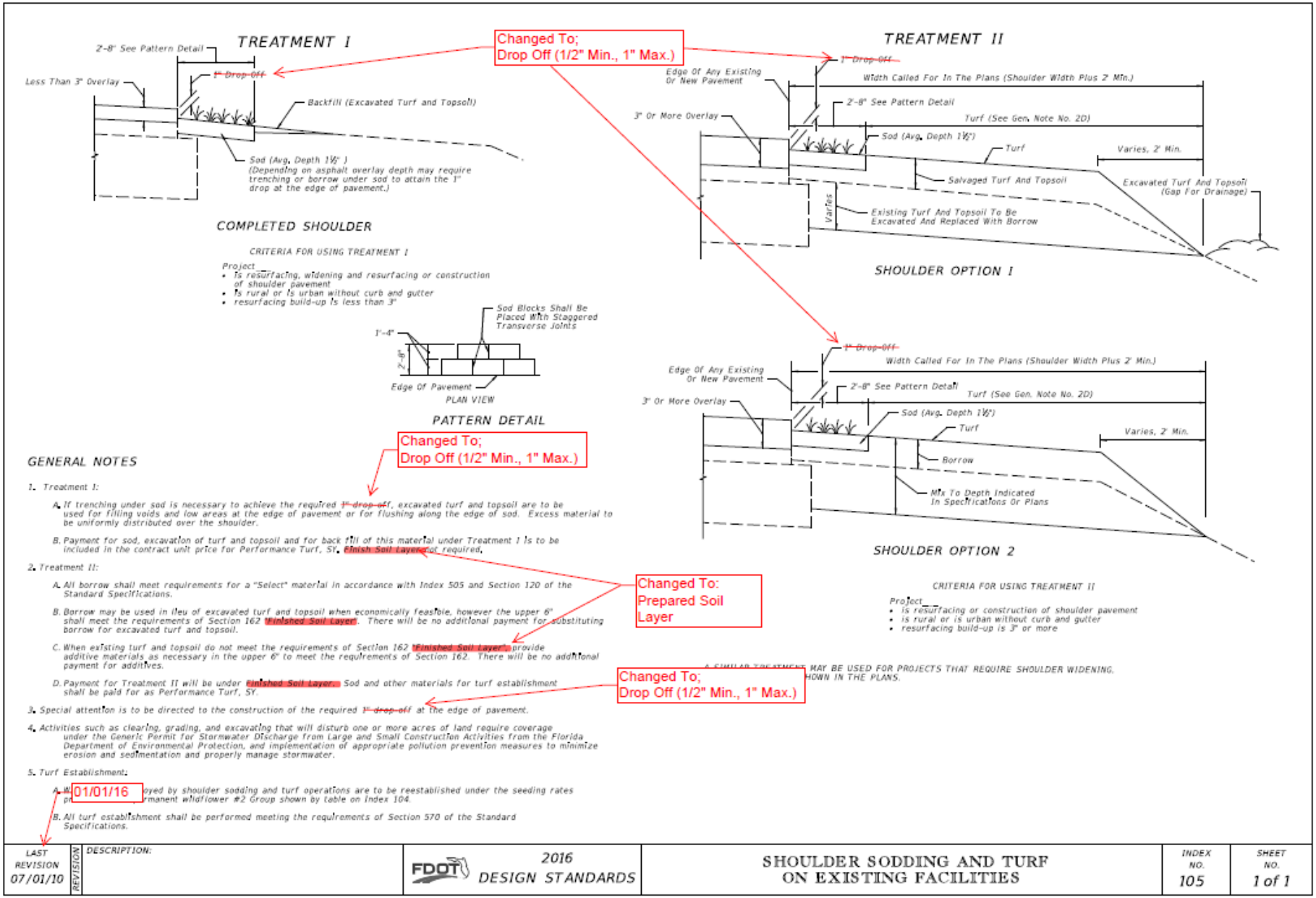
2) ***200 Series*** **of Indexes**
   - Location Reference to Sta./Offset Location
   - Bond Breaker = Organic Felt
   - Updated Lap Splice Lengths

3) ***Index 304*** - Detectable Warnings and Sidewalk Curb Ramps
   - Removed Criteria Information
   - Updated to Clarify Common Questions/Misunderstandings

4) ***Index 307*** - Miscellaneous Utility Details
   - Reorganized Notes/Details for Clarity
   - Reduced Minimum Excavation Dimensions

5) ***Index 310*** - Concrete Sidewalk
   - Provided General Notes for Entire Index
   - Added 6" Concrete at Curb Ramps/Radial Returns

Design Standards, Index 105



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   - Bond Breaker = Organic Felt
   - Updated Lap Splice Lengths

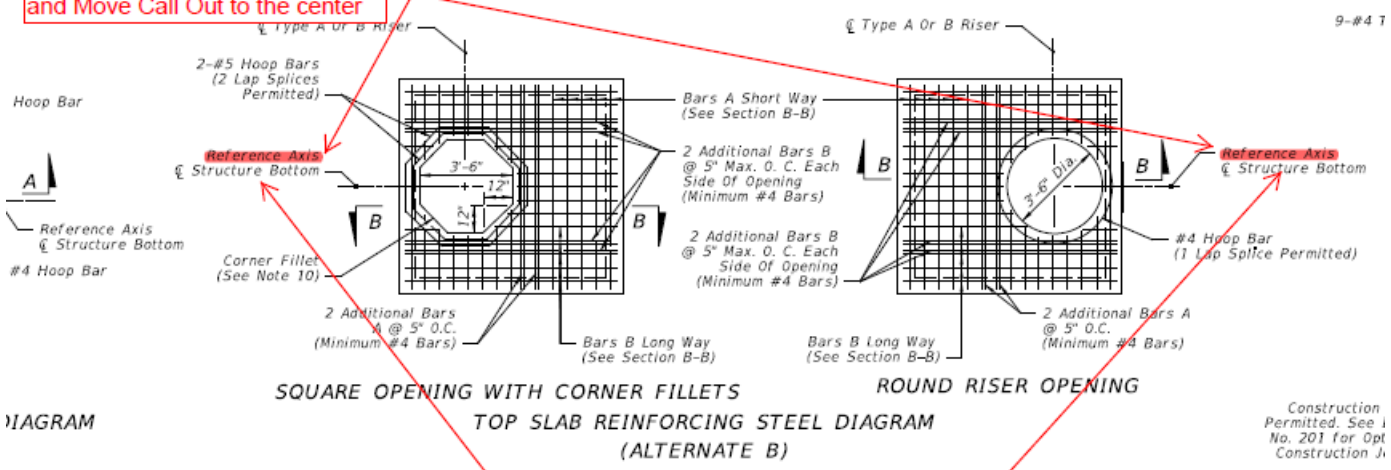
3) ***Index 304*** - Detectable Warnings and Sidewalk Curb Ramps
   - Removed Criteria Information
   - Updated to Clarify Common Questions/Misunderstandings

4) ***Index 307*** - Miscellaneous Utility Details
   - Reorganized Notes/Details for Clarity
   - Reduced Minimum Excavation Dimensions

5) ***Index 310*** - Concrete Sidewalk
   - Provided General Notes for Entire Index
   - Added 6" Concrete at Curb Ramps/Radial Returns

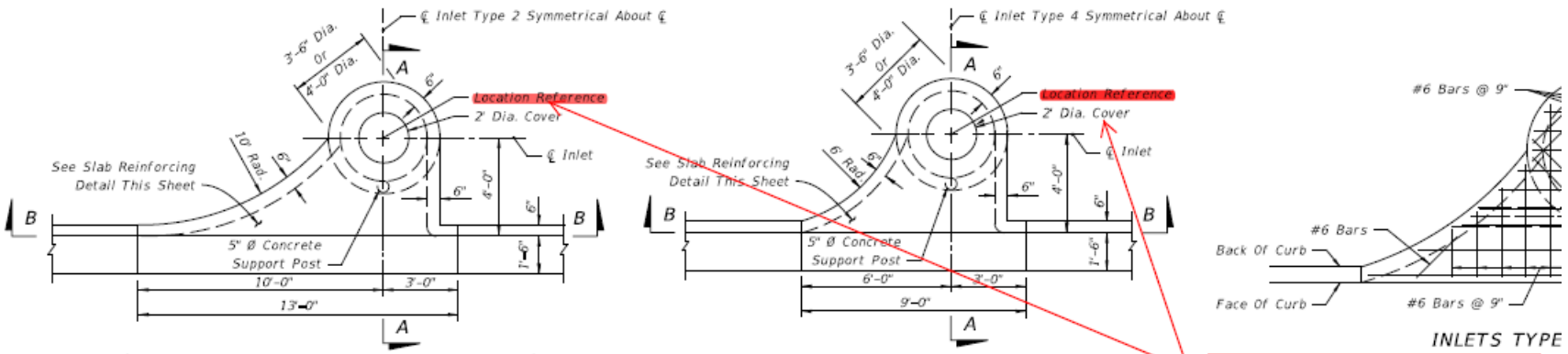
Design Standards, 200 Series

Change To: Sta./ Offset Location and Move Call Out to the center



Split the Call Out and keep the Structure Bottom Call Out in the same location.

STRUCTURE BOTTOMS TYPE J AND P	INDEX NO. 200	SHEET NO. 1 of 5



Change To: Sta./ Offset Location

CURB INLET TOPS TYPES 1, 2, 3 AND 4	INDEX NO. 210	SHEET NO. 1 of 1

Design Standards – Index Updates

1) ***Index 105*** - Shoulder Sodding and Turf on Existing Facilities
   - Changed Allowable Drop-off to Range of ½" to 1"

2) ***200 Series*** **of Indexes**
   - Location Reference to Sta./Offset Location
   - Bond Breaker = Organic Felt
   - Updated Lap Splice Lengths

3) ***Index 304*** - Detectable Warnings and Sidewalk Curb Ramps
   - Removed Criteria Information
   - Updated to Clarify Common Questions/Misunderstandings

4) ***Index 307*** - Miscellaneous Utility Details
   - Reorganized Notes/Details for Clarity
   - Reduced Minimum Excavation Dimensions

5) ***Index 310*** - Concrete Sidewalk
   - Provided General Notes for Entire Index
   - Added 6" Concrete at Curb Ramps/Radial Returns

Updated Notes Format and Moved Criteria Information to PPM, Vol. 1, Chapter 8.

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. Steeper slopes are not permitted unless otherwise detailed in the Plans.

   B. Landings must have 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)

2. Grade Breaks:

   Grade breaks at the top and bottom of ramps must be parallel to each other and perpendicular to the direction of the ramp slope.

3. Existing Curb, Curb and Gutter and/or Sidewalk:

   A. Remove any existing curb or curb and gutter to the nearest joint beyond the curb transition or to the extent that no remaining section of curb or curb and gutter is less than 5 feet long. Remove any existing sidewalk to the nearest joint beyond the transition slope or to the extent that no remaining section of sidewalk is less than 5 feet long.

   B. Refer to Index 310 for Concrete Sidewalk details.

4. Curb Ramp Alpha-Identification:

   A. Sidewalk curb ramp alpha-identifications (e.g. CR-A) are provided for reference purposes in the Plans.

   B. Alpha-identifications CR-I and CR-J are intentionally omitted.

5. Detectable Warnings:

   A. Install detectable warnings in accordance with Specification Section 527.

   B. Place detectable warnings across the full width of the ramp or landing, to a depth of 2 feet measured perpendicular to the curb line and no greater than 5 feet from the back of the curb or edge of pavement.

   C. If detectable warnings are shown in the Plans on slopes greater than 5%, align the truncated domes with the centerline of the ramp; otherwise, the truncated domes are not required to be aligned.

6. Detectable Warnings – Acceptance Criteria:

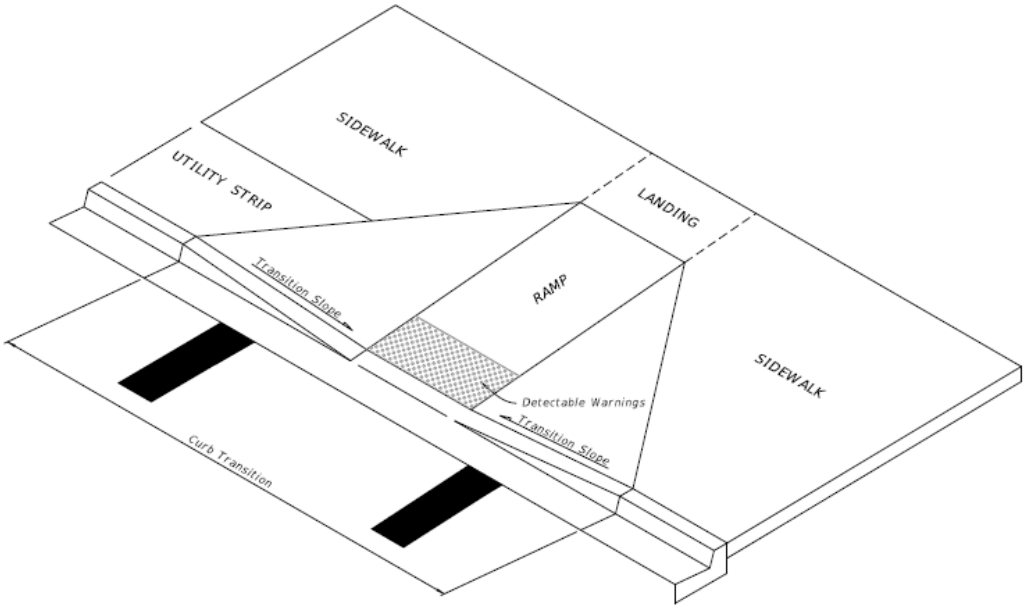
   A. Color and texture shall be complete and uniform.

   B. 90% of individual truncated domes shall be in accordance with the Americans with Disabilities Act Standards for Transportation Facilities, Section 705.

   C. There shall be no more than 4 non-compliant domes in any one square foot.

   D. Non-compliant domes shall not be adjacent to other non-compliant domes.

   E. Surfaces shall not deviate more than 0.10" from a true plane.



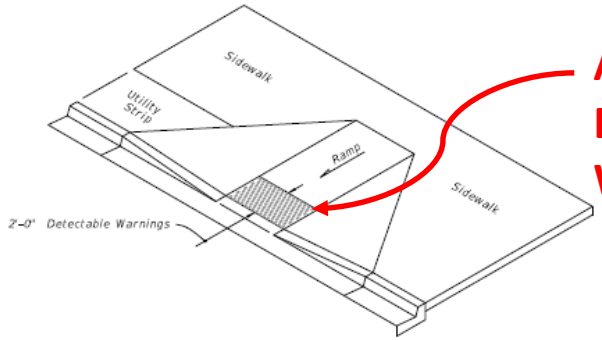
CURB RAMP NOMENCLATURE

Updated Nomenclature Detail to Include All Referenced Compentents

10/27/2016 10:53:24 AM

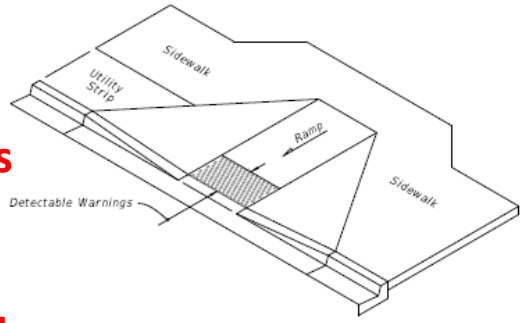
LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2017-18 DESIGN STANDARDS	DETECTABLE WARNINGS AND SIDEWALK CURB RAMPS	INDEX NO.	SHEET NO.
11/01/16					304	1 of 8

Design Standards – Index 304



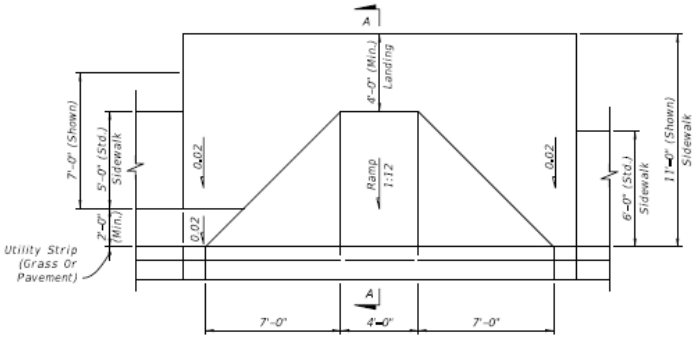
ISOMETRIC VIEW

Added Detectable Warnings to ISO's



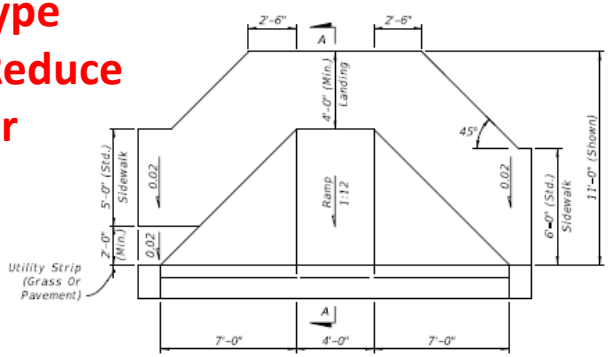
ISOMETRIC VIEW

Separated Curb Ramp Type Details to Reduce Clutter



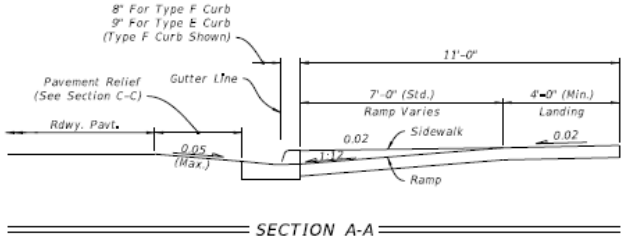
PLAN VIEW

CR-A



PLAN VIEW

CR-B



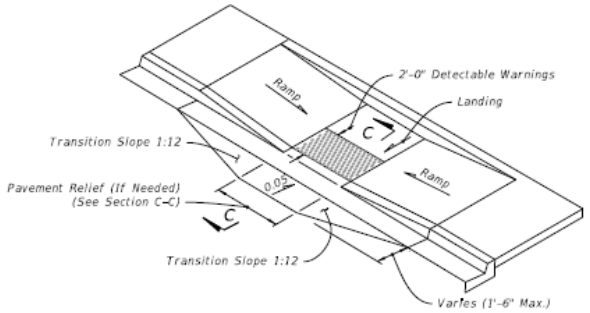
SECTION A-A

Corrected Section A-A

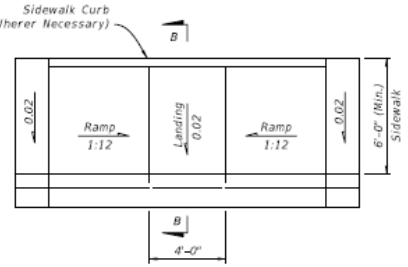
SIDEWALK CURB RAMPS CR-A AND CR-B

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2017-18 DESIGN STANDARDS	DETECTABLE WARNINGS AND SIDEWALK CURB RAMPS	INDEX NO.	SHEET NO.
11/01/16						304	2 of 8

10/27/2016 10:52:26 AM



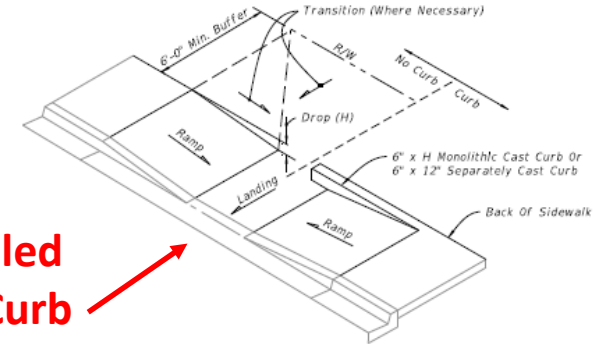
ISOMETRIC VIEW



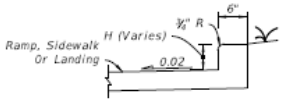
PLAN VIEW

CR-C

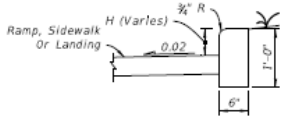
Fully Detailed Sidewalk Curb Detail



CONSTRUCTION OF SIDEWALK CURB IN CUT SECTIONS

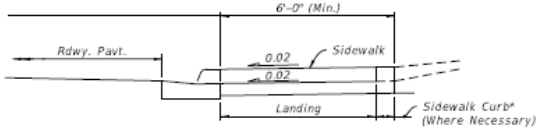


MONOLITHIC CAST CURB



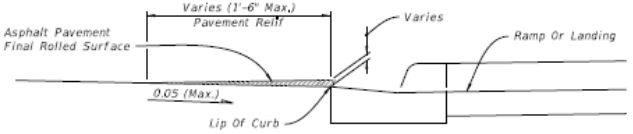
SEPARATLEY CAST CURB

SIDEWALK CURB OPTIONS



* Note: For Additional Information On Sidewalk Curb Construction, See SIDEWALK CURB OPTIONS details.

SECTION B-B

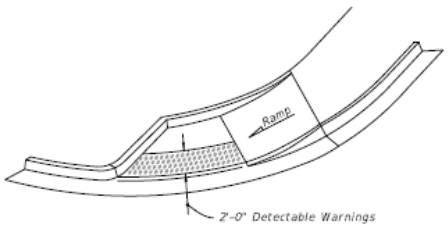


Note: Remove Elevated Pavement By Spading And Rolling, Smooth Milling or Grinding.

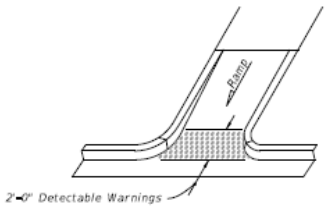
SECTION C-C

SIDEWALK CURB RAMPS CR-C AND SIDEWALK CURB

Design Standards – Index 304



ISOMETRIC VIEW



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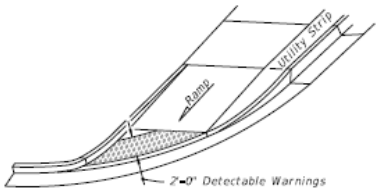
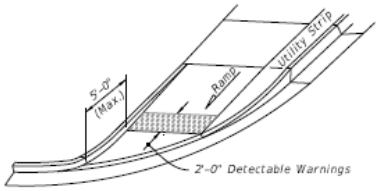
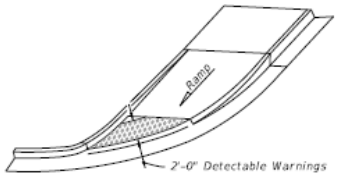


OPTION A



OPTION B

ISOMETRIC VIEW



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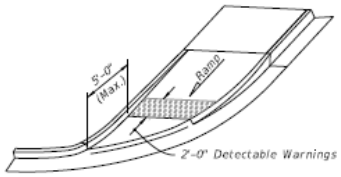

OPTION B

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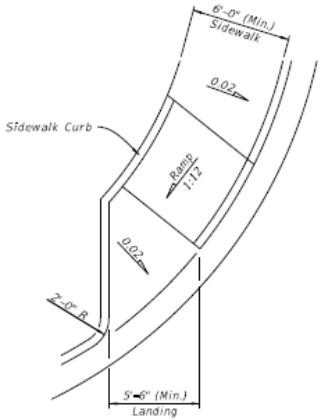
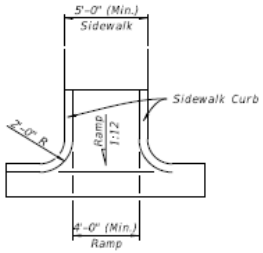


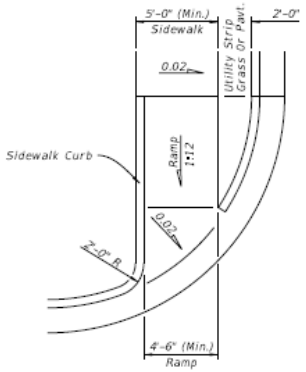
PLAN VIEW

CR-D



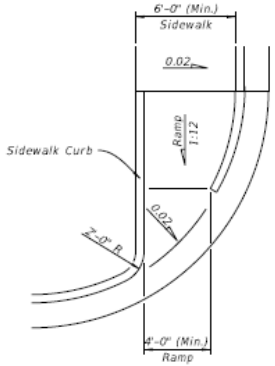
PLAN VIEW

CR-E



PLAN VIEW

CR-F



CR-G

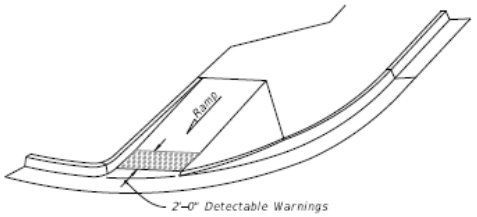
SIDEWALK CURB RAMPS CR-D, CR-E, CR-F & CR-G

LAST REVISION 11/01/16	REVISION	DESCRIPTION:	FDOT FY 2017-18 DESIGN STANDARDS	DETECTABLE WARNINGS AND SIDEWALK CURB RAMPS	INDEX NO. 304	SHEET NO. 4 of 8

11/30/2016 8:58:21 AM

Design Standards – Index 304

Added 2 Options for CR-L



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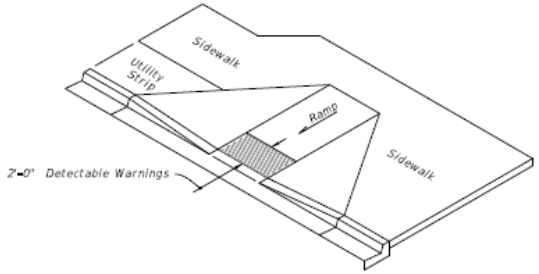

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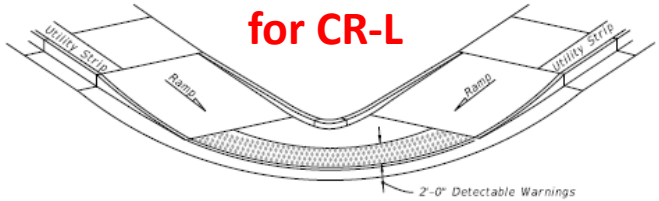
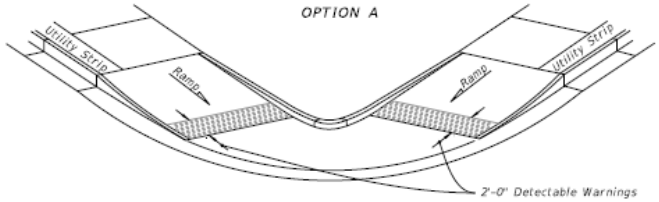
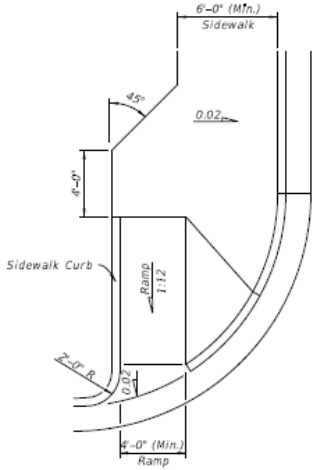


OPTION A



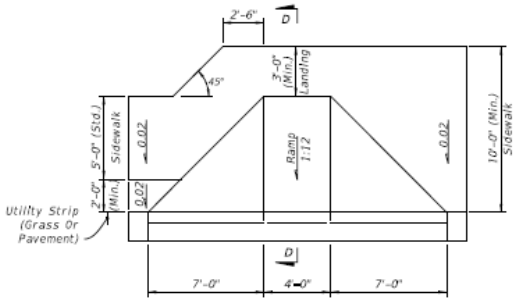
OPTION B

ISOMETRIC VIEW



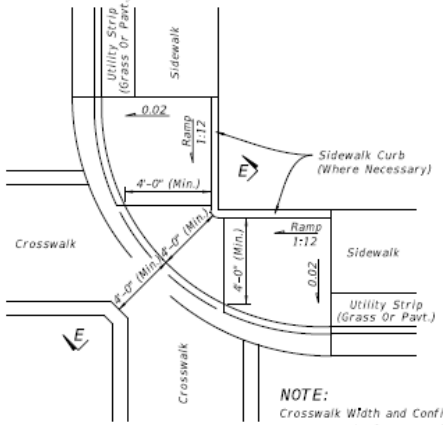
PLAN VIEW

CR-H



PLAN VIEW

CR-K

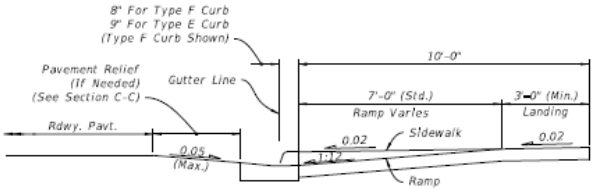


NOTE:
Crosswalk Width and Configuration Vary; Must Conform to Index 17344 and 17346.

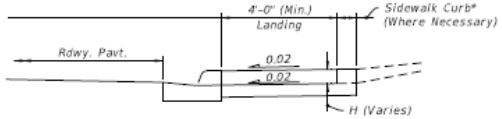
15' Radius Curve Shown for CR-L.

PLAN VIEW

CR-L



SECTION D-D



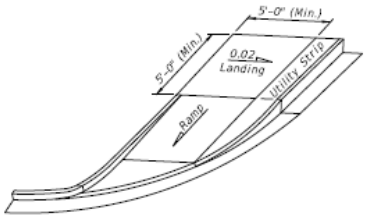
* Note: For Additional Information On Sidewalk Curb Construction, See SIDEWALK CURB OPTIONS details.

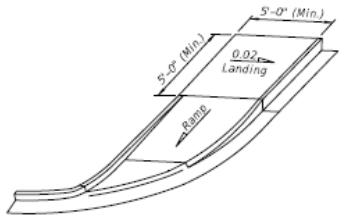
SECTION E-E

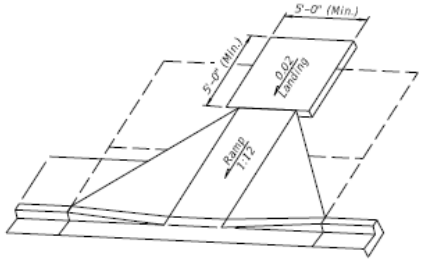
SIDEWALK CURB RAMPS CR-H, CR-K & CR-L

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2017-18 DESIGN STANDARDS	DETECTABLE WARNINGS AND SIDEWALK CURB RAMPS	INDEX NO.	SHEET NO.
11/01/16						304	5 of 8

11/9/2016 6:58:23 AM

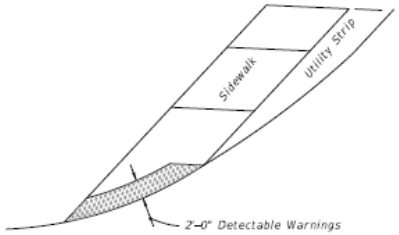




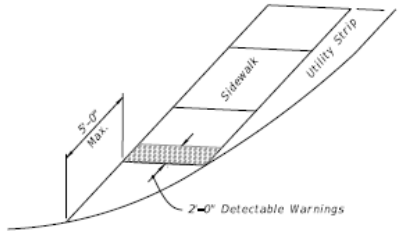


LANDINGS FOR CURB RAMPS WITHOUT SIDEWALKS

(See CR-F, CR-G & CR-K Respectively For Detectable Warning Details/Options)



OPTION A



OPTION B

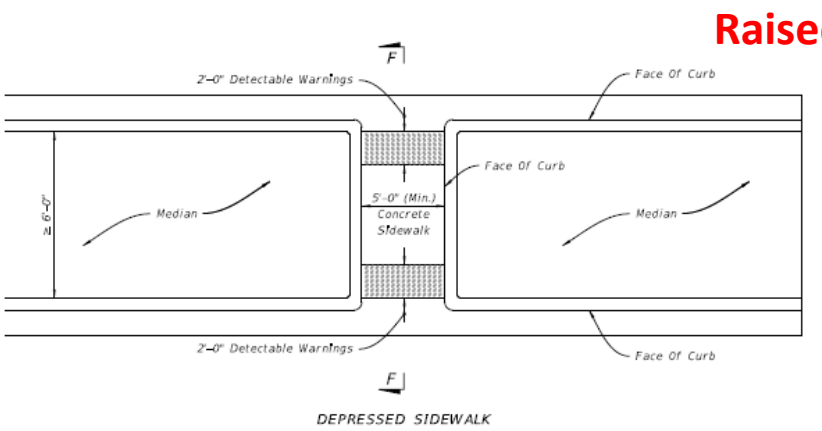
DETECTABLE WARNING ON FLUSH SHOULDER SIDEWALKS

CURB RAMPS WITHOUT SIDEWALKS AND FLUSH SHOULDER SIDEWALKS

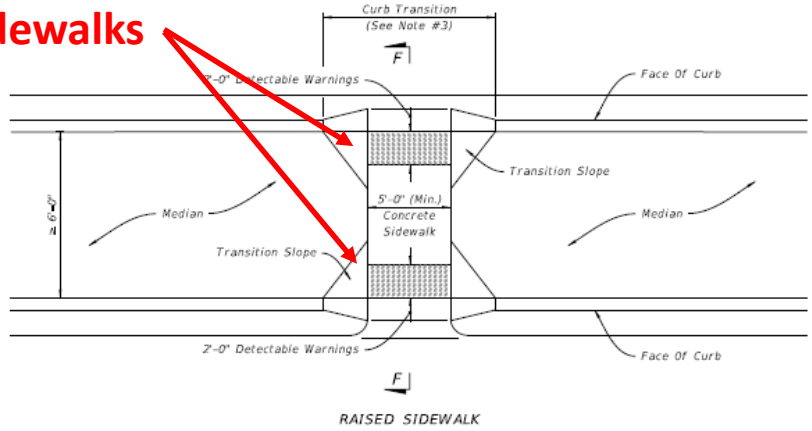
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2017-18 DESIGN STANDARDS	DETECTABLE WARNINGS AND SIDEWALK CURB RAMPS	INDEX NO.	SHEET NO.
11/01/16						304	6 of 8

10/27/2016 10:53:05 AM

Added Transition Slope to Raised Sidewalks



DEPRESSED SIDEWALK



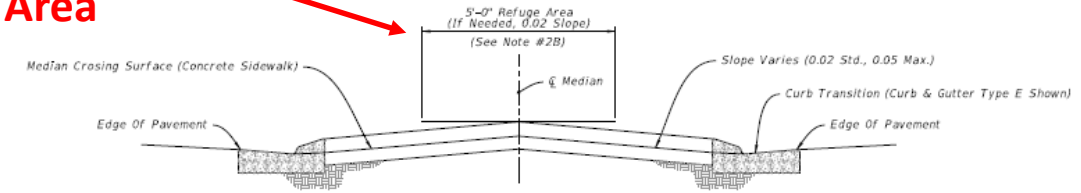
RAISED SIDEWALK

MEDIAN CROSSINGS

Simplified Notes for Median Refuge Area

NOTES:

1. Cross Slope of the median crossing not to exceed 0.02.
2. Running Slopes:
   A. Slopes ≤ 0.05: For roadway cross sections were the Edge of Pavement elevation is the same for both directions of traffic, the median crossing running slopes (0.02 Typ.) should meet at the centerline of the median. For roadway cross sections with variable Edge of Pavement elevations, or to accommodate other construction in the median, the slopes may intersect off the centerline of the median.
   B. Slopes > 0.05: Provide a median refuge area (landing, 0.02 slope) for crossings with running slopes > 0.05. The refuge area must extend the full width of the crossing and have a minimum length of 5 feet.
3. On existing facilities, remove and reconstruct curb transition for raised sidewalk with ramp.



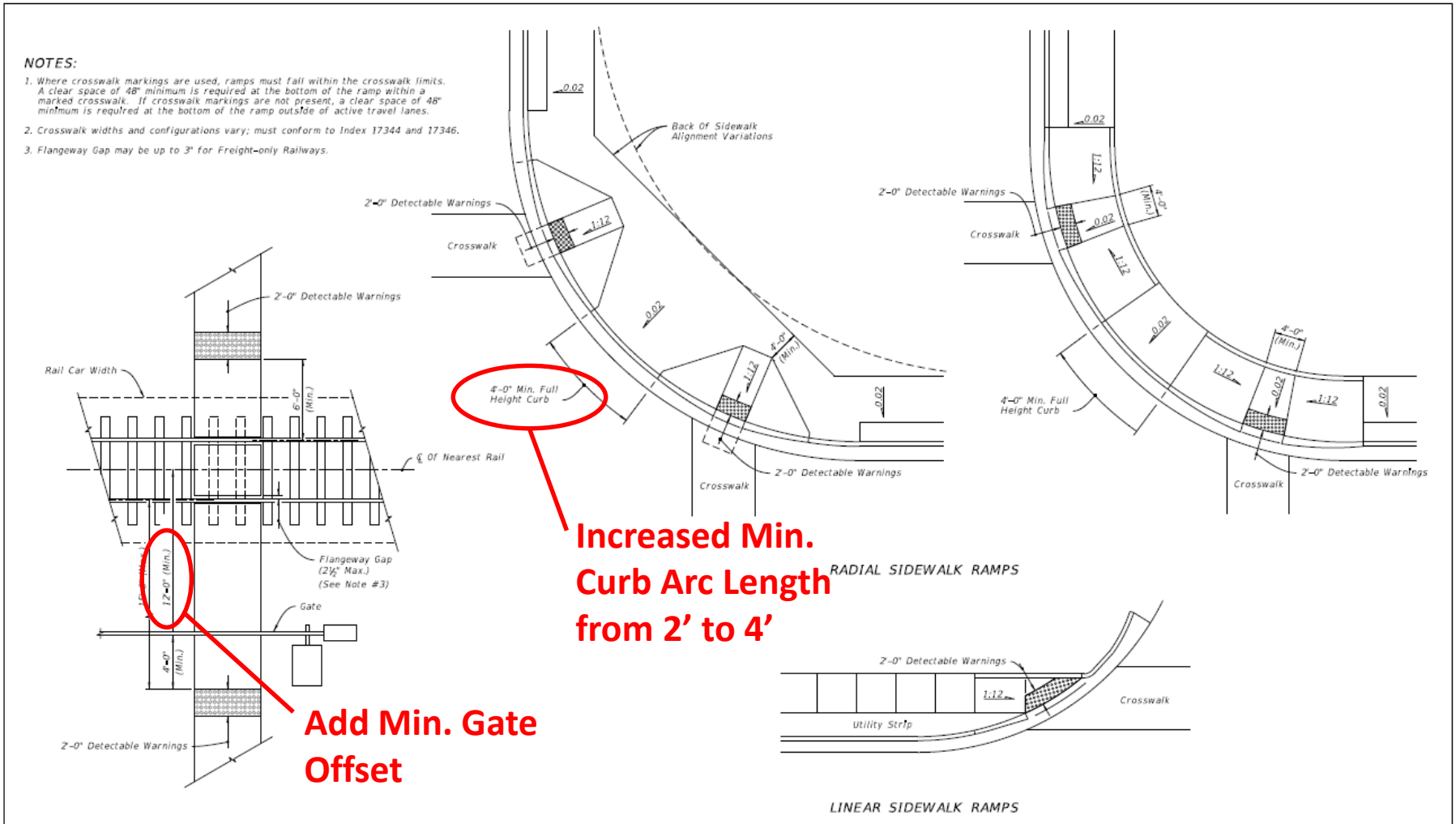
SECTION F-F

MEDIAN CROSSING

10/27/2016 10:53:09 AM

LAST REVISION 11/01/16	REVISION	DESCRIPTION:	FDOT FY 2017-18 DESIGN STANDARDS	DETECTABLE WARNINGS AND SIDEWALK CURB RAMPS	INDEX NO. 304	SHEET NO. 7 of 8

Design Standards – Index 304



LAST REVISION 11/01/16	REVISION	DESCRIPTION:	FDOT FY 2017-18 DESIGN STANDARDS	DETECTABLE WARNINGS AND SIDEWALK CURB RAMPS	INDEX NO. 304	SHEET NO. 8 of 8

Design Standards – IDS 304

Added Curb Ramp Type Usage Categories to IDS

Alpha-identifications have been provided in the Index for the various curb ramp options (e.g. CR-A, CR-B, etc.) to facilitate ease of callouts in the Plans.

- Curb Ramps CR-A, CR-B & CR-C are for use where ramp and landing depths are not restricted.
- Curb Ramps CR-D, CR-E, CR-F, CR-G and CR-H are for linear pedestrian traffic.
- Curb Ramps CR-K and CR-L are for use where ramp and landing depths are restricted.

Moved Detectable Warning Surface Area Table to IDS

Table 1 Surface Area of Detectable Warnings

Curb Ramp Type	Curb Radius (ft)	Total Area (sf)
CR-A	N/A	8
CR-B	N/A	8
CR-C	N/A	8
CR-D	25	11
CR-E	N/A	8
CR-F	10	9
	20	11
	25	13
	30	14
CR-G	10	10
	20	11
	25	12
	30	14
CR-H	20	8
	25	8
	30	8
CR-K	N/A	8
CR-L	10	18
	15	13
Flush Shoulder Option A	10	11
	20	14
	25	15
	30	17
	40	19
	50	21
Flush Shoulder Option B	10	10
	20	10
	25	10

Design Standards – Index Updates

✓ ***1)*** ***Index 105*** - Shoulder Sodding and Turf on Existing Facilities
- Changed Allowable Drop-off to Range of ½" to 1"

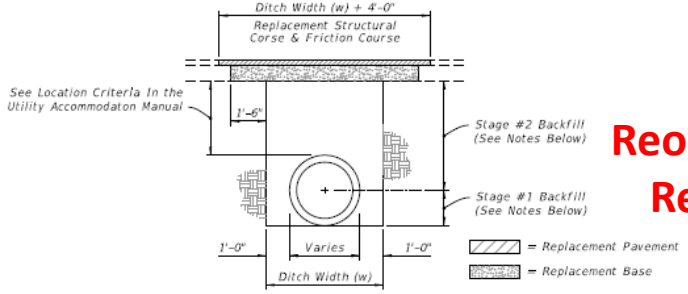
✓ ***2)*** ***200 Series*** **of Indexes**
- Location Reference to Sta./Offset Location
- Bond Breaker = Organic Felt
- Updated Lap Splice Lengths

✓ ***3)*** ***Index 304*** - Detectable Warnings and Sidewalk Curb Ramps
- Removed Criteria Information
- Updated to Clarify Common Questions/Misunderstandings

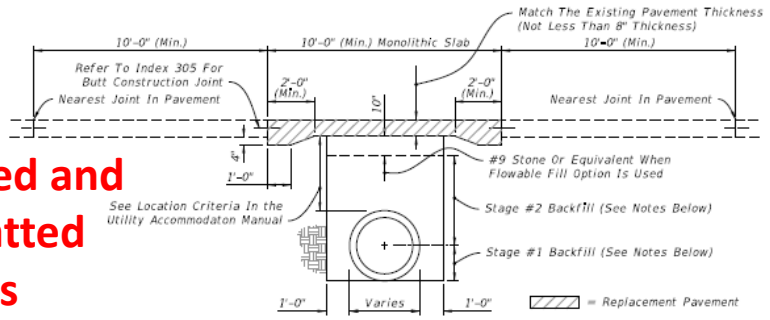
4) ***Index 307*** - Miscellaneous Utility Details
- Reorganized Notes/Details for Clarity
- Reduced Minimum Excavation Dimensions

5) ***Index 310*** - Concrete Sidewalk
- Provided General Notes for Entire Index
- Added 6" Concrete at Curb Ramps/Radial Returns

Design Standards – Index 307



Reorganized and Reformatted Notes



NOTES:

PAVEMENT REMOVAL AND REPLACEMENT

1. Pavement shall be mechanically sawed.
2. The replacement asphalt shall match the existing structural and friction courses for type and thickness in accordance with current FDOT asphalt mix specifications.
3. The new base materials shall be either of the same type and composition as the materials removed or of equal or greater structural adequacy (See Index No. 514).

BACKFILL OPTION

1. COMPACTED AND STABILIZED FILL
   - A. Backfill material shall be placed in accordance with Section 125 of the Standard Specifications.
   - B. In Stage #1, construct compacted fill beneath the haunches of the pipe, using mechanical tamps suitable for this purpose. This compaction applies to the material placed beneath the haunches of the pipe and above any bedding.
   - C. In Stage #2, construct compacted fill along the sides of the pipe and up to the bottom of the base, with the upper 12" receiving Type B Stabilization. In lieu of Type B Stabilization, the Contractor may construct using Optional Base Group 3.
2. FLOWABLE FILL
   - A. If compaction can not be achieved through normal mechanical methods then flowable fill may be used.
   - B. Flowable fill is to be placed in accordance with Section 121 of the Specifications, as approved by the Engineer.
   - C. Do not allow the utility being installed to float. If a method is provided to prevent flotation from occurring, Stages #1 and #2 can be combined, if approved by the Engineer.
   - D. In Stage #1, place flowable fill midway up on both sides of the utility. Allow to harden before placing Stage #2.
   - E. In Stage #2, place flowable fill to the bottom of the existing base course.

FLEXIBLE PAVEMENT CUT

NOTES:

PAVEMENT REMOVAL AND REPLACEMENT

1. High early strength cement concrete (3000 psi) meeting the requirements of Standard Specification 346 shall be used for rigid pavement replacement.
2. Pavement shall be mechanically sawed and restored to conform with existing pavement joints within 12 hours. (See Index 305)

BACKFILL OPTION

1. GRANULAR BACKRILL
   - A. Any edgedrain system that is removed shall be replaced with the same type materials. Any edgedrain system that is damaged shall be repaired with methods approved by the Engineer.
   - B. Fill material shall be placed in accordance with the Standard Specifications. Fill material shall be special select soil in accordance with Index 505.
   - C. In Stage #1, construct compacted fill beneath the haunches of the pipe, using mechanical tamps suitable for this purpose. This compaction applies to the material placed beneath the haunches of the pipe and above any bedding.
   - D. In Stage #2, construct fill along the sides of the pipe and up to the bottom of replacement pavement.
2. FLOWABLE FILL
   - A. If mechanical compaction can not be achieved through normal mechanical methods then flowable fill may be used.
   - B. Flowable fill is to be placed in accordance with Section 121 of the Specifications, as approved by the Engineer.
   - C. Do not allow the utility being installed to float. If a method is provided to prevent flotation from occurring, Stages #1 and #2 can be combined, if approved by the Engineer.
   - D. In Stage #1, place flowable fill midway up on both sides of the utility. Allow to harden before placing Stage #2.
   - E. In Stage #2, place flowable fill to the bottom of the stone layer.

RIGID PAVEMENT CUT

GENERAL NOTES

1. The details provided in this standard index apply to cases in which jack and bore or directional boring methods are not required by the Engineer.
2. Flowable fill shall not be placed directly over loose, or high plastic, or muck material (see Index 505) which will cause settlement due to fill weight. Where highly compressible material exists, the amount, shape and depth of flowable fill must be engineered to prevent pavement settlement.
3. These details do not apply to utility cuts longitudinal to the centerline of the roadway which may require the additional use of geotextiles, special bedding and backfill, or other special requirements.
4. Method of construction must be approved by the Engineer.
5. Some pipe may require special granular backfill up to 6" above top of pipe. Geotextiles may be required to encapsulate the special granular material.
6. Where asphalt concrete overlays exist over full slab concrete pavement, the replacement pavement shall have an overlay constructed over the replacement slab. The overlay shall match the existing asphalt pavement thickness. The replacement friction course shall match the existing friction course, except structural course may be used in lieu of dense graded friction course.
7. All shoulder pavement, curb, curb and gutter, and their substructure disturbed by utility trench cut construction shall be restored in kind.
8. The use of flowable fill to reduce the time traffic is taken off a facility is acceptable but must have prior approval by the Engineer. Flowable fill use is allowed only when properly engineered for pavement crossings, whether straight or diagonal, and shall not be installed for significant depths or lengths. The maximum length shall be fifty (50) feet and a maximum depth of six (6) feet unless supported by an engineering document prepared by a registered professional engineer that specializes in soils engineering. The engineering document shall address the evaluation of local groundwater flow interruption and settlement potential.
9. Excavatable flowable fill is to be used when the flowable fill option is selected.

TRENCH CUTS AND RESTORATIONS ACROSS ROADWAYS

LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2017-18 DESIGN STANDARDS	MISCELLANEOUS UTILITY DETAILS	INDEX NO.	SHEET NO.
11/01/16					307	1 of 3

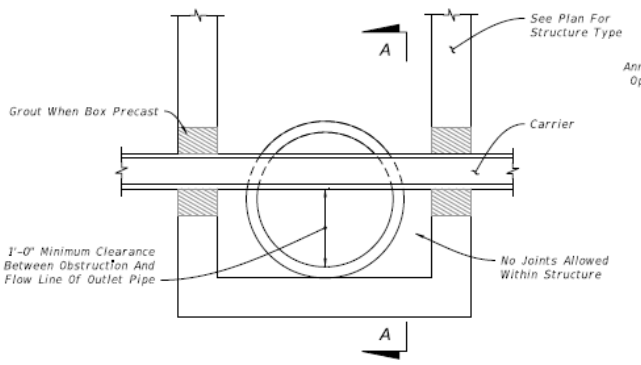
10/12/2016 9:34:54 AM

NOTES:

1. These details are for construction field expediency to resolve utility conflicts that cannot be remedied by relocation. For conflicts determined during design, use the construction shop drawings for structure details.
2. Concrete used in conflict structures shall be as specified in ASTM C478. 4000 psi may be used in lieu of Class I concrete.
3. Maximum opening for pipe shall be the pipe OD plus 6". Mortar used to seal the pipe into the opening will be of such mix that shrinkage will not cause leakage into or out of the structure.
4. If the conflict structure is round or there are multiple inlet or outlet pipes, then the wall section should be reviewed for strength.
5. If during construction or the plans design process it is determined that a potable water supply line must pass though a storm drain structure, it must be in compliance with Chapter 62–555.314 (3) F.A.C. and shown on the design or construction plans and submitted to the Florida Department of Environmental Protection (FDEP) Administrator For Drinking Water in the respective FDEP District for review and comment. This index and rule citation provide accepted methods for addressing conflicts when and where they cannot be reasonably avoided. To be submitted along with the plans shall be a justification describing inordinate cost and the impracticality of avoidance. If identified, properly justified, and accomplished in accordance with this index, approval is granted. Upon request, the Utility Agency Owner (UAO) must provide support data on the cost of relocation or adjustment to the FDOT for submittal to the FDEP. See the following web site for District FDEP Drinking Water Contacts: www.dep.state.fl.us/water/drinkingwater/index.htm and click on "Organization" on the menu to the right.

DESIGNER'S NOTES:

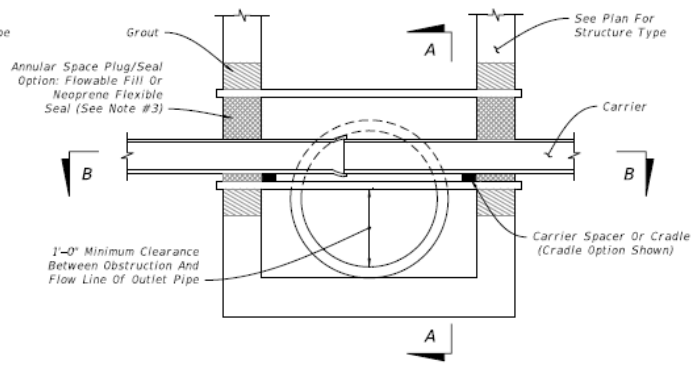
"Sumped" conflict manholes shall not be sued unless the system is hydraulically designed to account for the jeadloss generated if the sump is completley blocked



SECTION LONGITUDINAL TO CARRIER PIPE

UTILITY CONFLICT CONDITION I

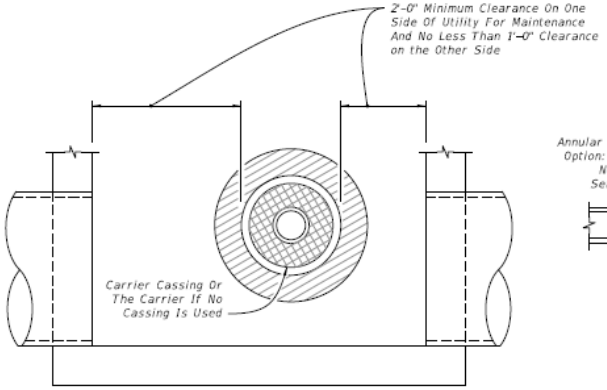
(Nonpresure Or Nonfluid Carrier Installations)



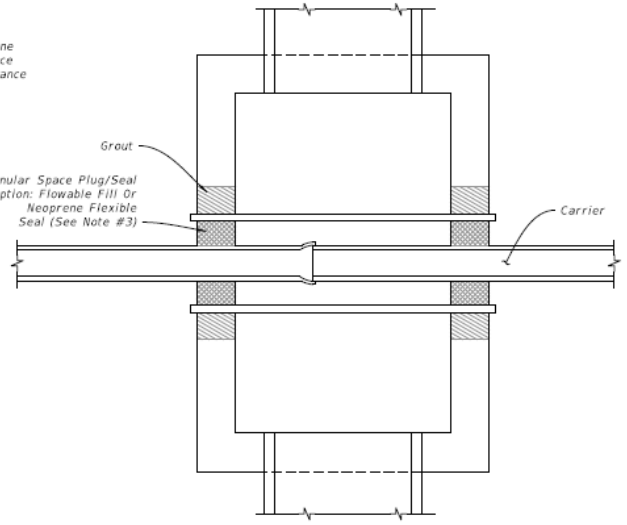
SECTION LONGITUDINAL TO CARRIER PIPE

UTILITY CONFLICT CONDITION II

(Presure Or Fluid Carrier Installations)



SECTION A-A



SECTION B-B

UTILITY CONFLICT PIPES THRU STORM DRAIN STRUCTURES

LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2017-18 DESIGN STANDARDS	MISCELLANEOUS UTILITY DETAILS	INDEX NO.	SHEET NO.
11/01/16					307	2 of 3

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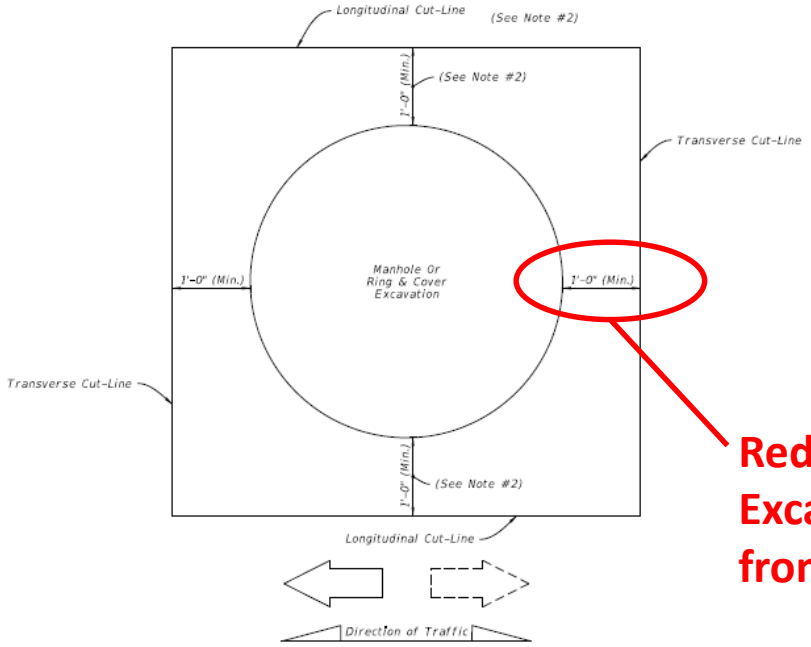
Design Standards – Index 307



Reduced Min. Excavation Limits from 4' to 1'

PARTIAL CUTS FOR RING AND COVER ADJUSTMENTS

NOTES

1. Cut-Lines must be straight and cleanly sawed.
2. Longitudinal Cut-Lines are the same for both rigid and flexible pavement. For Transverse Cut-Lines in rigid pavement, extend the Cut-Line to the nearest existing joint.
3. See Sheet 1 for replacement pavement.

NONTRENCH PAVEMENT CUTS FOR UNDERGROUND UTILITY STRUCTURES IN PAVEMENT

LAST REVISION 11/01/16	REVISION	DESCRIPTION:	FDOT FY 2017-18 DESIGN STANDARDS	MISCELLANEOUS UTILITY DETAILS	INDEX NO. 307	SHEET NO. 3 of 3

10/12/2016 9:24:58 AM

Design Standards – Index Updates

✓ ***1)*** ***Index 105*** - Shoulder Sodding and Turf on Existing Facilities
- Changed Allowable Drop-off to Range of ½" to 1"

✓ ***2)*** ***200 Series*** **of Indexes**
- Location Reference to Sta./Offset Location
- Bond Breaker = Organic Felt
- Updated Lap Splice Lengths

✓ ***3)*** ***Index 304*** - Detectable Warnings and Sidewalk Curb Ramps
- Removed Criteria Information
- Updated to Clarify Common Questions/Misunderstandings

✓ ***4)*** ***Index 307*** - Miscellaneous Utility Details
- Reorganized Notes/Details for Clarity
- Reduced Minimum Excavation Dimensions

5) ***Index 310*** - Concrete Sidewalk
- Provided General Notes for Entire Index
- Added 6" Concrete at Curb Ramps/Radial Returns

Design Standards – Index 310

GENERAL NOTES:

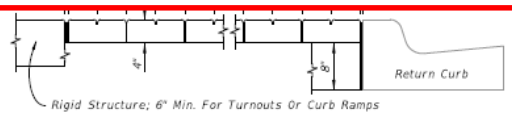
1. Construct sidewalks in accordance with Specification Section 522.
2. Include detectable warnings on sidewalk curb ramps in accordance with Index 304.
3. For TURNOUTS see Index 515.
4. Bond breaker material can be any impermeable coated or sheet membrane or preformed material having a thickness of not less than 6 mils nor more than ½".
5. Construct sidewalks with Edge Beam through the limits of any surface mounted Pedestrian/Bicycle Railing or Pipe Guiderail shown in the plans. (See RAILING DETAIL)

Combined Notes for Entire Index

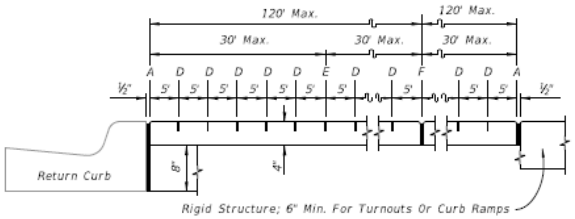
6. When roadways or driveways are newly constructed, reconstructed or altered, construct the cross slopes for crosswalks and discontinuous sidewalks as follows:

   A. Cross Slope = 0.02 for roadways or driveway controlled by "STOP" Sign or "YIELD" sign.

   B. Cross Slope = 0.05 for roadways or driveways controlled by traffic signal.



OPEN JOINTS



SAWED JOINTS

LONGITUDINAL SECTION

LEGEND:

A- ½" Expansion Joints (Preformed Joint Filler)

B- ⅛" Dummy Joints, Tooled

C- ½" Formed Open Joints

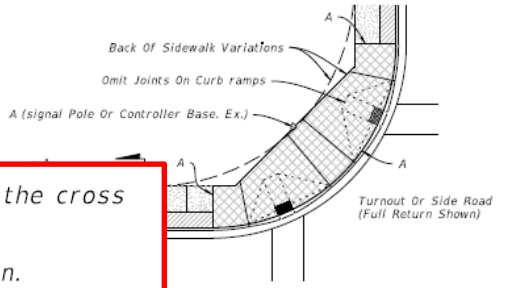
D- 3/16" Saw Cut Joints, 1½" Deep (within 96 hours) Max. 5' Centers

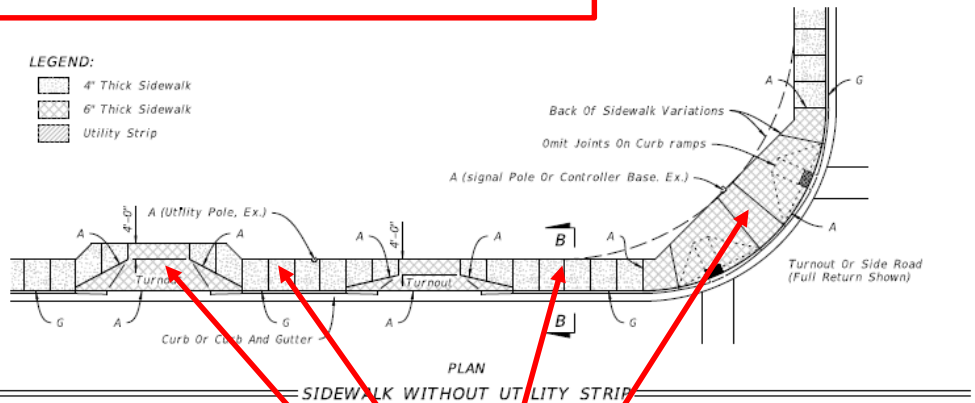
E- 3/16" Saw Cut Joints, 1½" Deep (within 12 hours) Max. 30' Centers Joint(s) Required When Length Exceeds 30'

F- ½" Expansion Joint When Run Of Sidewalk Exceeds 120'. Intermediate locations when called for in the plans or at locations as directed by the Engineer.

G- Cold Joint With Bond Breaker, Tooled

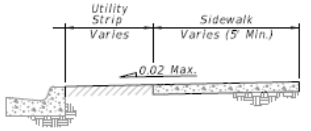
SIDEWALK JOINTS





PLAN

SIDEWALK WITHOUT UTILITY STRIP



SECTION A-A

LEGEND:

4" Thick Sidewalk

6" Thick Sidewalk

Utility Strip

GENERAL NOTES AND CONCRETE SIDEWALK ON CURBED ROADWAYS

LAST REVISION 11/01/16	REVISION	DESCRIPTION:	FDOT FY 2017-18 DESIGN STANDARDS	CONCRETE SIDEWALK	INDEX NO. 310	SHEET NO. 1 of 2

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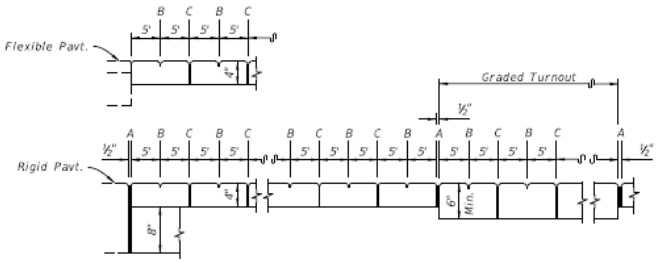
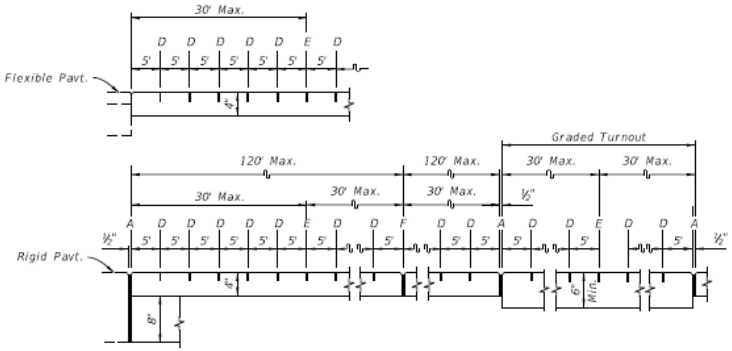


OPEN JOINTS



SAWED JOINTS

LONGITUDINAL SECTION

LEGEND:

A- ½" Expansion Joints (Preformed Joint Filler)

B- ⅛" Dummy Joints, Tooled

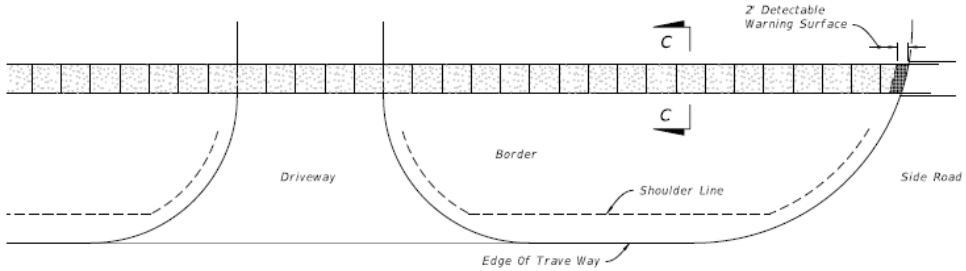
C- ⅛" Formed Open Joints

D- 3/16" Saw Cut Joints, 1½" Deep (within 96 hours) Max. 5' Centers

E- 3/16" Saw Cut Joints, 1½" Deep (within 12 hours) Max. 30' Centers Joint(s) Required When Length Exceeds 30'

F- ½" Expansion Joint When Run Of Sidewalk Exceeds 120'. Intermediate locations when called for in the plans or at locations as directed by the Engineer.

SIDEWALK JOINTS

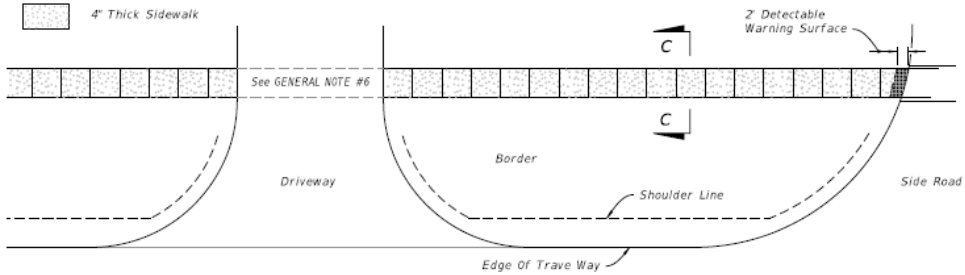


PLAN

CONTINUOUS SIDEWALK

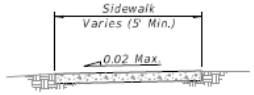
LEGEND:

4" Thick Sidewalk



PLAN

DISCONTINUOUS SIDEWALK



SECTION C-C

CONCRETE SIDEWALK ON FLUSH SHOULDER ROADWAYS

LAST REVISION	REVISION	DESCRIPTION:			INDEX NO.	SHEET NO.
11/01/16			FDOT FY 2017-18 DESIGN STANDARDS	CONCRETE SIDEWALK	310	2 of 2

10/12/2016 9:35:56 AM

Design Standards – Index Updates

✓ ***1)*** ***Index 105*** - Shoulder Sodding and Turf on Existing Facilities
- Changed Allowable Drop-off to Range of ½” to 1”

✓ ***2)*** ***200 Series*** **of Indexes**
- Location Reference to Sta./Offset Location
- Bond Breaker = Organic Felt
- Updated Lap Splice Lengths

✓ ***3)*** ***Index 304*** - Detectable Warnings and Sidewalk Curb Ramps
- Removed Criteria Information
- Updated to Clarify Common Questions/Misunderstandings

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- Reduced Minimum Excavation Dimensions

✓ ***5)*** ***Index 310*** - Concrete Sidewalk
- Provided General Notes for Entire Index
- Added 6” Concrete at Curb Ramps/Radial Returns

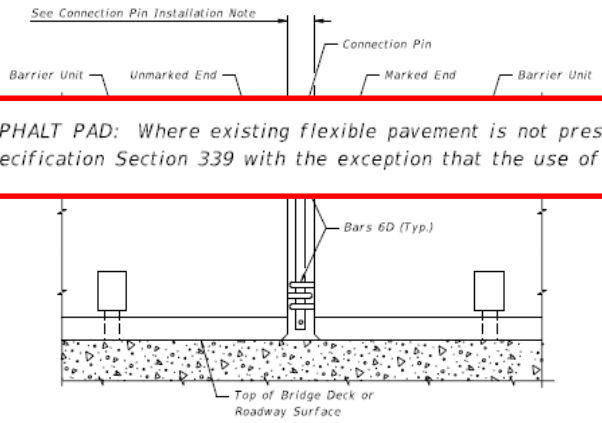
Design Standards – Index Updates

6) ***Index 414*** - Type K Temporary Concrete Barrier System
   - Revised Asphalt Pad Requirements

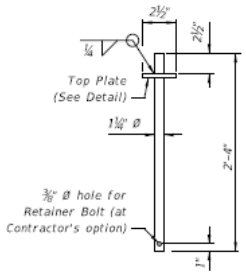
7) ***Index 415*** - Temporary Concrete Barrier
   - Revised Asphalt Pad Requirements

8) ***Index 500*** - Removal of Organic and Plastic Material
   - Removed Designer Notes (Added to PPM)
   - Updated Details for Clarification

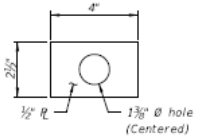
9) ***Index 514*** - Optional Base Group and Structural Numbers
   - Index Deleted
   - Flexible Pavement Design Manual/Standard Specifications



DETAIL OF CONNECTION BETWEEN BARRIER UNITS



CONNECTION PIN DETAIL



TOP PLATE DETAIL

NOTES FOR ALL INSTALLATIONS:

1. LIMITATION OF USE: This Temporary Concrete Barrier System is intended for work zone traffic control and other temporary applications. It shall not be used for permanent traffic railing construction unless specifically permitted by the Plans. Except as shown for the Back Filled Roadway Installations, the Barrier Units must be installed on a flexible pavement (asphalt) or rigid pavement (concrete) surface as shown with a cross slope of 1:10 or flatter. Except as shown for transition installations, Type K Barrier Units are not intended to be bolted down or staked down in locations where they can be impacted from the back side.

2. HANDLING: At no time shall the Barrier Units be lifted or moved by use of Bars 6D that extend from the ends of the units. Approximate weight of one unit equals 2.7 tons.

3. ASPHALT PAD: Where existing flexible pavement is not present, construct a minimum 2" thick temporary Asphalt Pad using Miscellaneous Asphalt Pavement in accordance with Specification Section 339 with the exception that the use of a pre-emergent herbicide is not required. No separate payment will be made for the Asphalt Pad.

5. OFFSET TO TRAVELWAY: Offset shall meet requirements as shown on sheet 1 of Index 415.

6. CONNECTION PIN ASSEMBLY: Steel for Connection Pin and Top Plate assemblies shall be in accordance with ASTM A36 or ASTM A709 Grade 36. Nondestructive testing of welds shall not be required. At the Contractor's option, a ⅜" diameter hole may be provided at the bottom of the Connection Pin, as shown, for the installation of a vandal resistance bolt.

7. CONNECTION PIN INSTALLATION: Initially set Barrier Units by using a 3⅝" wooden block between ends of adjacent units. Install Connection Pin between adjacent Barrier Units as shown, then pull newly placed Barrier Unit away from adjacent Barrier Unit to remove slack between Connection Pin and Bars 6D (except as shown on Sheet 5). Barrier Units shall not be used unconnected.

8. DELINEATION: Mount Barrier Delineators on top of Barrier Units that are used as traffic barriers along travel ways in work zones. Space the Barrier Delineators at 50' centers in alignment transitions, 100' centers on horizontal curves and 200' centers on tangent alignments.

9. MAINTENANCE: Deflection space shall be kept clear of any grass, construction debris, stockpiled materials, equipment, and objects.

10. REUSE OF CONNECTION PINS: Connection pins may be reused if they have the structural integrity of new pins.

11. INSTALLATIONS ON CURVED ALIGNMENTS: The details presented in these Standards are shown for installations on tangent alignments. Details for horizontally curved alignments are similar.

12. TRANSITIONS: Transitions are required between freestanding, bolted down, staked down and back filled Type K Barrier installations, see Sheet 8 for transition requirements and details. Transitions are also required between installations of Type K Barrier and other types of temporary barrier, see Index No. 415 for transition requirements and details. Splices and transitions are required between installations of Type K Barrier and permanent Bridge or Roadway Traffic Railings, see Sheets 9 through 13 for transition requirements and details. Transitions are required between installations of Type K Barrier and Proprietary (APL) Barrier Systems, See Sheets 14 and 15 for transition requirements and details.

13. PAYMENT: Barrier Units for work zone traffic control and other temporary applications shall be paid for under the contract unit price for Barrier (Temporary) (F&I) (Type K), LF. Any relocation of the Barrier Units required for the project shall be paid for under the contract unit price for Barrier (Temporary) (Relocate) (Type K), LF. The Contractor shall furnish Barrier Units except when the Plans stipulate the availability of Department owned units. Regardless of unit source the Contractor shall furnish all hardware and shall be responsible for all handling including loading, transport, unloading, stockpiling, installation, removal and return. Unless otherwise noted on the Plans, the Barrier Units shall become the property of the Contractor and shall be removed from the site prior to acceptance of the completed project.

NOTES FOR THRIE BEAM GUARDRAIL SPLICE INSTALLATIONS:

1. THRIE-BEAM GUARDRAIL: Provide Thrie-Beam Guardrail for splices in accordance with AASHTO M 180, Type II (Zinc coated) and as follows: Two panels per splice (One panel per side) of Class B (10 Gauge), or Four panels per splice (Two nested panels per side) of Class A (12 Gauge). Guardrail panel length shall be 12'-6". Provide and Install all other associated metallic guardrail components (Terminal Connectors, Shoulder Bolts, Hex Bolts and Nuts, Filler Plates, etc.) in accordance with Index No. 400. Install five Guardrail Anchor Bolts at each end of each splice in any of the standard seven anchor bolt holes in the Thrie-Beam Terminal Connector. If reinforcing steel is encountered when drilling holes for Guardrail Anchor Bolts in Type K Barrier Units, shift Thrie-Beam Terminal Connector so as to clear reinforcing steel within the given tolerances or select a different bolt hole to use. Do not drill or cut through reinforcing steel within Type K Barrier Units. Drilling or cutting through reinforcing steel within permanent concrete traffic railings is permitted. Do not drill or cut through utilities or conduits within permanent concrete traffic railings.

2. GUARDRAIL OFFSET BLOCKS: Provide and install timber Offset Blocks meeting the material requirements of Index No. 400. Field trim Offset Blocks as required for proper fit. Utilize Offset Blocks as shown and required in order to prevent bending or kinking of Thrie-Beam Guardrail panels.

3. CONCRETE FOR FILLING TAPERED TRAFFIC RAILING TOES: Provide concrete for filling tapered toes of Traffic Railings as shown meeting the material requirements of Specification Section 346, any Class, or a commercially available prebagged concrete mix (3000 psi minimum compressive strength). Sampling, testing, evaluation and certification of the concrete in accordance with Specification Section 346 is not required. Saturate with water the surfaces upon and against which the concrete fill will be placed prior to placing concrete. Place and finish concrete fill using forms or by hand methods to the general configurations shown so as to provide a smooth shape transition between the Type K Barrier and the adjacent traffic railing. A low slump is desirable if placing and finishing concrete by hand methods. Cure the concrete fill by application of a curing compound, or by covering with a wet tarp or burlap for a minimum of 24 hours. Completely remove the concrete fill upon relocation or removal of the Type K Temporary Concrete Barrier.

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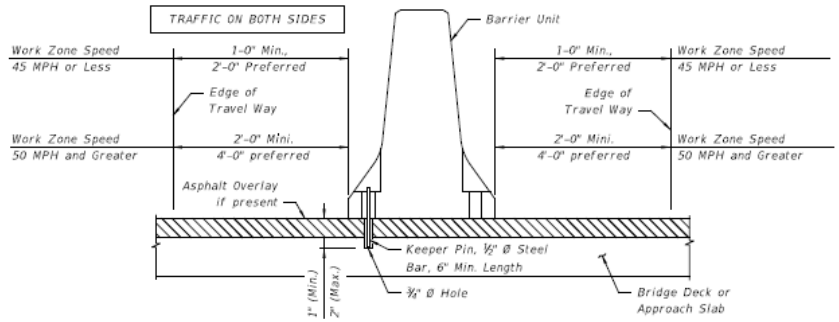
LAST REVISION 11/01/16	REVISION	DESCRIPTION:	FDOT FY 2017-18 DESIGN STANDARDS	TYPE K TEMPORARY CONCRETE BARRIER SYSTEM	INDEX NO. 414	SHEET NO. 4 of 15

Design Standards – Index 414

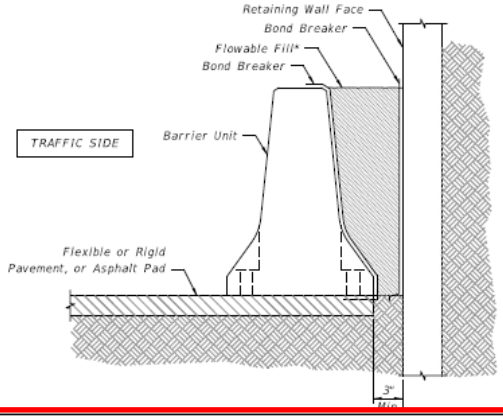


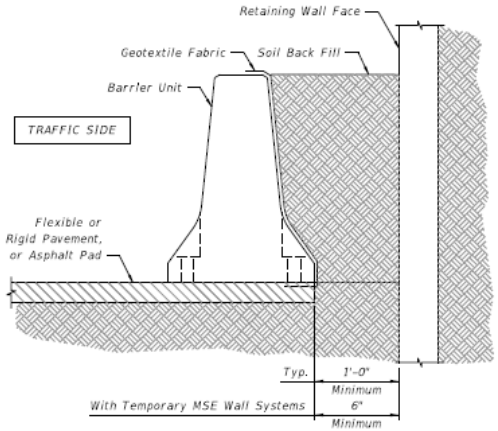
TYPICAL SECTION

NOTES FOR FREESTANDING MEDIAN INSTALLATION:

KEEPER PINS: Required for Bridge Decks only, Keeper Pins shall be ½" diameter, smooth steel bar in accordan
ASTM A 709 Grade 36. As directed by the Engineer in order to limit vibration induced translation of the Barri
Keeper Pin per Barrier Unit as shown. Alternate Keeper Pin locations from side to side of Barrier Units along
installation. Do not drill into or otherwise damage bridge deck expansion joints or drains. Upon removal or re
remove all Keeper Pins and completely fill the remaining holes in bridge decks and approach slabs that are to
Ammonium Phosphate Concrete in accordance with Specification Section 930 or with an Epoxy Resin Compound,
accordance with Specification Section 926. If a flexible pavement overlay is present and is to remain, comple
holes in the flexible pavement with hot or cold patch asphalt material.

FREESTANDING MEDIAN INSTALLATION
(Bridge Deck Shown, Approach Slab, Asphalt Pad, Flexible or Rigid Pave





TYPICAL SECTION
ADJACENT TO RETAINING WALL WITH SOIL BACK FILL

NOTES FOR SO

SOIL BACK FILL M
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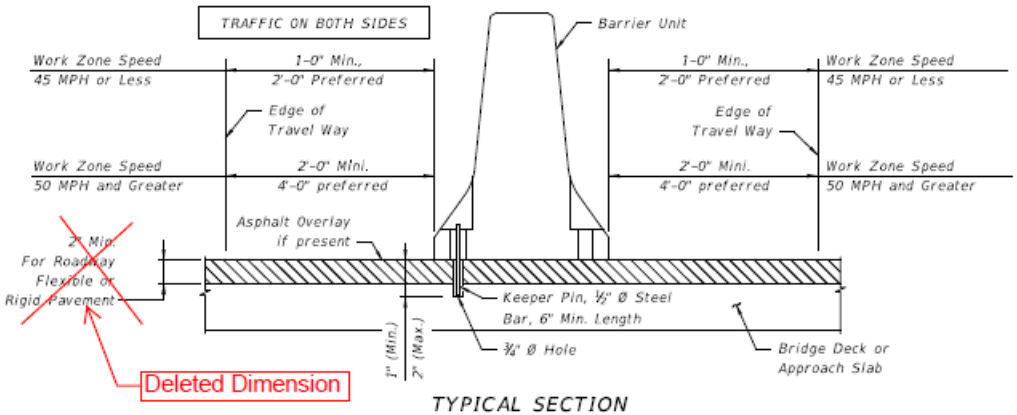


TYPICAL SECTION

NOTES FOR FREESTANDING MEDIAN INSTALLATION:

KEEPER PINS: Required for Bridge Decks only, Keeper Pins shall be ½" diameter, smooth steel bar in accordance with ASTM A 36 or ASTM A 709 Grade 36. As directed by the Engineer in order to limit vibration induced translation of the Barrier Units, install one (1) Keeper Pin per Barrier Unit as shown. Alternate Keeper Pin locations from side to side of Barrier Units along the length of the installation. Do not drill into or otherwise damage bridge deck expansion joints or drains. Upon removal or relocation of Barrier Units, remove all Keeper Pins and completely fill the remaining holes in bridge decks and approach slabs that are to remain with Magnesium Ammonium Phosphate Concrete in accordance with Specification Section 930 or with an Epoxy Resin Compound, Type F or Q, in accordance with Specification Section 926. If a flexible pavement overlay is present and is to remain, completely fill the remaining holes in the flexible pavement with hot or cold patch asphalt material.

~~ASPHALT PAD: Where existing pavement is not present, construct the Asphalt Pad using Miscellaneous Asphalt Pavement in accordance with Specification Section 339 with the exception that the use of a pre-emergent herbicide is not required. No separate payment will be made for the Asphalt Pad.~~

FREESTANDING MEDIAN INSTALLATION
(BRIDGE DECK SHOWN, APPROACH SLAB, ASPHALT PAD, FLEXIBLE OR RIGID PAVEMENT SIMILAR)

Deleted Note

Retaining Wall Face

LAST REVISION	REVISION	DESCRIPTION:
11/01/16		

10/24/2016 10:25 AM

Design Standards – Index Updates

6) ***Index 414*** - Type K Temporary Concrete Barrier System
   - Revised Asphalt Pad Requirements

7) ***Index 415*** - Temporary Concrete Barrier
   - Revised Asphalt Pad Requirements

8) ***Index 500*** - Removal of Organic and Plastic Material
   - Removed Designer Notes (Added to PPM)
   - Updated Details for Clarification

9) ***Index 514*** - Optional Base Group and Structural Numbers
   - Index Deleted
   - Flexible Pavement Design Manual/Standard Specifications

GENERAL NOTES

1. Temporary concrete barrier systems on roadways may be any of the following:

   a. The FDOT Type K Temporary Concrete Barrier system (Design Standard Index 414). F-Shape Units. For temporary concrete barrier systems on bridges see Design Standard Index No. 414.

   b. Proprietary temporary concrete barrier systems meeting NCHRP Report 350 Test Level 3 criteria which are included on the Approved Products List.

2. Barrier units of dissimilar types may be interconnected within a single line barriers using transition units.

3. Alignment, length of need, anchorage and end treatment shall be in accordance with this Index.

4. Temporary concrete barrier units shown herein shall not be used for permanent barrier construction regardless of unit length.

5. If the plans specify Barrier (Temporary) (Type K), substitution with other barrier types is not permitted.

6. If the plans specify temporary concrete barrier system, substitution with water filled barriers is not permitted.

7. Where existing flexible pavement is not present, construct a minimum 2" thick temporary Asphalt Pad using Miscellaneous Asphalt Pavement in accordance with Specification Section 339 with the exception that the use of a pre-emergent herbicide is not required. No separate payment will be made for the Asphalt Pad.

8. B…

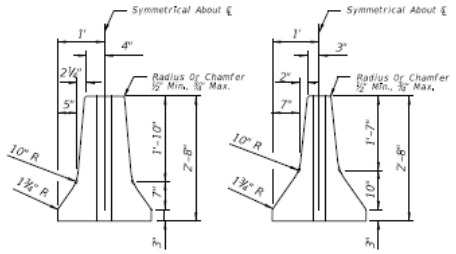
9. B…

10. …

11. Placing alternate temporary barrier systems with heights greater than 32 inches within the work zone may obstruct the clear sight distance at intersections and driveways. Prior to placing these barrier systems, the contractor shall submit a Certification Statement that the clear sight distance meets the requirements of Index 546, signed and sealed by a Florida Professional Engineer.

12. Minimum temporary concrete barriers installed per run shall be 16 units.

7. Where existing flexible pavement is not present, construct a minimum 2" thick temporary Asphalt Pad using Miscellaneous Asphalt Pavement in accordance with Specification Section 339 with the exception that the use of a pre-emergent herbicide is not required. No separate payment will be made for the Asphalt Pad.

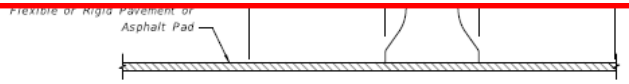


F-SHAPE N.J. SHAPE

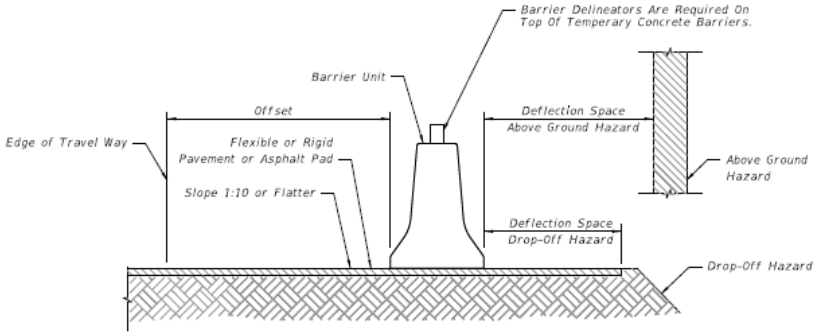
END VIEWS

REINFORCEMENT AND OTHER UNIT FABRICATION DETAILS NOT SHOWN.

PERMITTED BARRIER UNIT END VIEWS



MEDIAN INSTALLATION



ROADWAY INSTALLATION

OFFSET AND DEFLECTION SPACE REQUIREMENTS

Installation	Shielding	Work Zone Speed	Offset to Travelway	Deflection Space
Left or Right Shoulder	Above Ground Hazards	45 mph or Less	1' min, 2' preferred	2' min.
		50 mph and Greater	2' min, 4' preferred	4' min.
	Drop-Off Hazards	45 mph or Less	1' min, 2' preferred	2' min.
		50 mph and Greater		
		a. Drop-offs 4' or Less and NO traffic below	2' min, 4' preferred	2' min.
		b. All drop-off conditions other than 'a'	2' min, 4' preferred	4' min.
Separating Traffic	Adjacent Opposing Traffic	45 mph or Less	1' min, 2' preferred	1' min, 2' prefered
		50 mph and Greater	2' min, 4' preferred	2' min, 4' preferred

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LAST REVISION 11/01/16	REVISION	DESCRIPTION:	FDOT FY 2017-18 DESIGN STANDARDS	TEMPORARY CONCRETE BARRIER	INDEX NO. 415	SHEET NO. 1 of 7

Design Standards – Index Updates

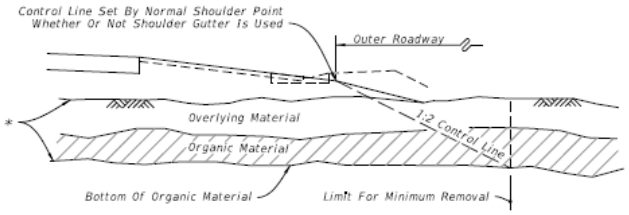
6) ***Index 414*** - Type K Temporary Concrete Barrier System
- Revised Asphalt Pad Requirements

7) ***Index 415*** - Temporary Concrete Barrier
- Revised Asphalt Pad Requirements

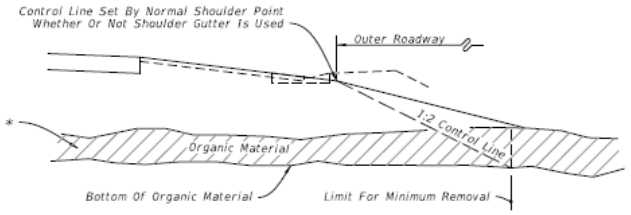
8) ***Index 500*** - Removal of Organic and Plastic Material
- Removed Designer Notes (Added to PPM)
- Updated Details for Clarification

9) ***Index 514*** - Optional Base Group and Structural Numbers
- Index Deleted
- Flexible Pavement Design Manual/Standard Specifications

Design Standards – Index 500



WITH OVERBURDEN - HALF SECTION



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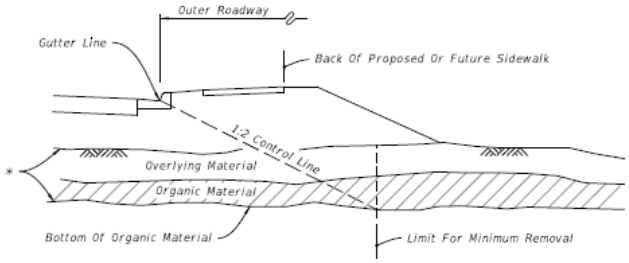
CONSTRUCTION OF FLUSH SHOULDER ROADWAY



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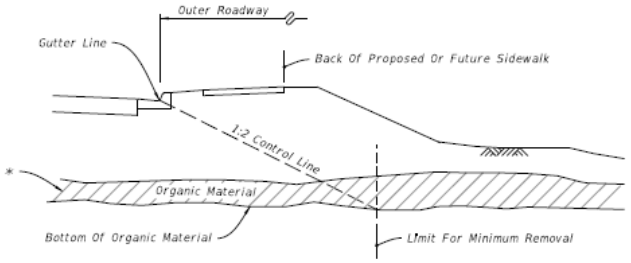

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CONSTRUCTION OF CURBED ROADWAY

* Remove overlying material and organic material within the limits shown and backfill in accordance with Index 505, unless approved otherwise by the District Geotechnical Engineer; The limits include full median width when applied to divided facilities with median widths up to 64'; When median width is greater than 64' and for bifurcated roadways the organic material removal limits will be set by a 1:2 control line complimentary to the outer roadway that will accommodate one future median lane on each roadway unless specified otherwise by the plans.

Consolidated Organic Material Note

GENERAL NOTES:

1. All details shown on this Index for removal of organic and plastic materials apply unless otherwise shown on the plans.
2. Utilize excavated materials in accordance with Index 505.
3. Where organic or plastic material is undercut, backfill with suitable material in accordance with Index 505, unless otherwise shown on the plans.
4. The term "Plastic Material" used in this Index in conjunction with removal of plastic soil is as defined under soil classifications for Plastic (P) and High Plastic (H) on Index 505.
5. See Index 506 for miscellaneous earthwork details.
6. The term "Organic Material" as used on this Index is defined as any soil which has an average organic content greater than five (5.0) percent, or an individual organic content test result which exceeds seven (7.0) percent. Remove organic material as shown on this Index and the plans unless directed otherwise by the District Geotechnical Engineer. Determine the average organic content from the test results from a minimum of three randomly selected samples from each stratum. Perform tests in accordance with AASHTO T267 on the portion of a sample passing the No. 4 sieve.
7. In areas of curbed roadway, where underdrain is to be constructed beneath the proposed pavement, the grade of the underdrain filter material will not extend above the bottom of the stabilized section of the subgrade. Gradation of the filter material must conform to Standard Specifications. The minimum grade of underdrain pipe is 0.02.

Edited General Notes for Plain Language

GENERAL NOTES AND REMOVAL OF ORGANIC MATERIAL

LAST REVISION 11/01/16	REVISION	DESCRIPTION:	FDOT FY 2017-18 DESIGN STANDARDS	REMOVAL OF ORGANIC AND PLASTIC MATERIAL	INDEX NO. 500	SHEET NO. 1 of 2

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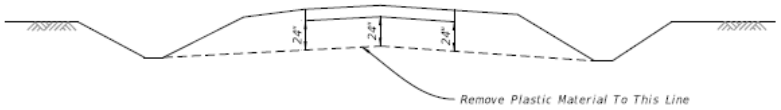
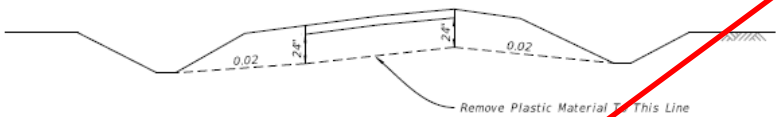
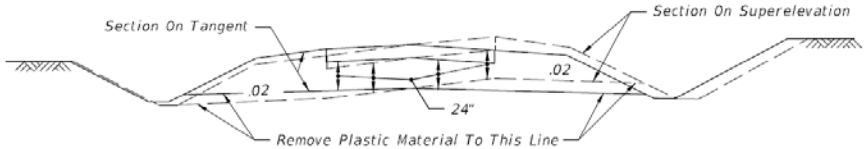


TYPICAL CUT SECTION ON TANGENT



TYPICAL CUT SECTION ON SUPERELEVATION

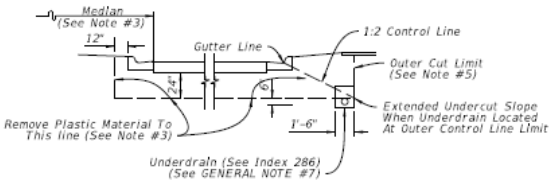
DIVIDED FREEWAYS, ARTERIALS, MAJOR COLLECTORS HAVING FLUSH MEDIANS, ON UNDIVIDED ARTERIALS AND MAJOR COLLECTORS



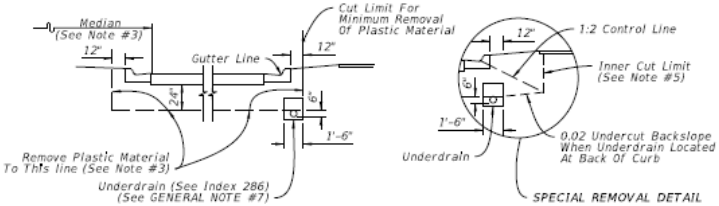
TYPICAL CUT SECTION

Note: When this detail is applied to minor collectors and local facilities, the undercut may be reduced to 18".

REMOVAL OF PLASTIC MATERIAL ON DIVIDED FREEWAYS, ARTERIALS AND MAJOR COLLECTORS HAVING FLUSH MEDIANS, AND ON UNDIVIDED ARTERIALS AND MAJOR COLLECTORS



PREFERABLE REMOVAL



MINIMUM REMOVAL

CONSTRUCTION AND LOCATION OF UNDERDRAIN IN CURBED ROADWAY
(See Note #4)

NOTES:

1. See Sheet 1 for the GENERAL NOTES.
2. When the typical cut details are applied to minor collectors and local facilities, the undercut may be reduced from 24" to 18".
3. Where frequency of median breaks indicates that it is impractical to leave plastic material in the median, the designer may elect to indicate total removal of this material. If during construction it becomes apparent, due to normal required construction procedures, that it is impractical to leave the plastic material in the median, total removal of this material shall be approved by the Engineer.
4. Refer to roadway cross sections to determine whether minimum or preferable removal is used.
5. Where the Preferable Removal method is shown in the plans and it is impossible to place the underdrain at the Outer Cut Limit due to conflict with storm drain trunk lines, remove to Inner Cut Limit and place underdrain at location shown for Minimum Removal. (See Special Removal Detail)
6. Cross slopes of 0.02 shown above are minimums. Follow the cross slope of the pavement to the extent possible.

REMOVAL OF PLASTIC MATERIAL

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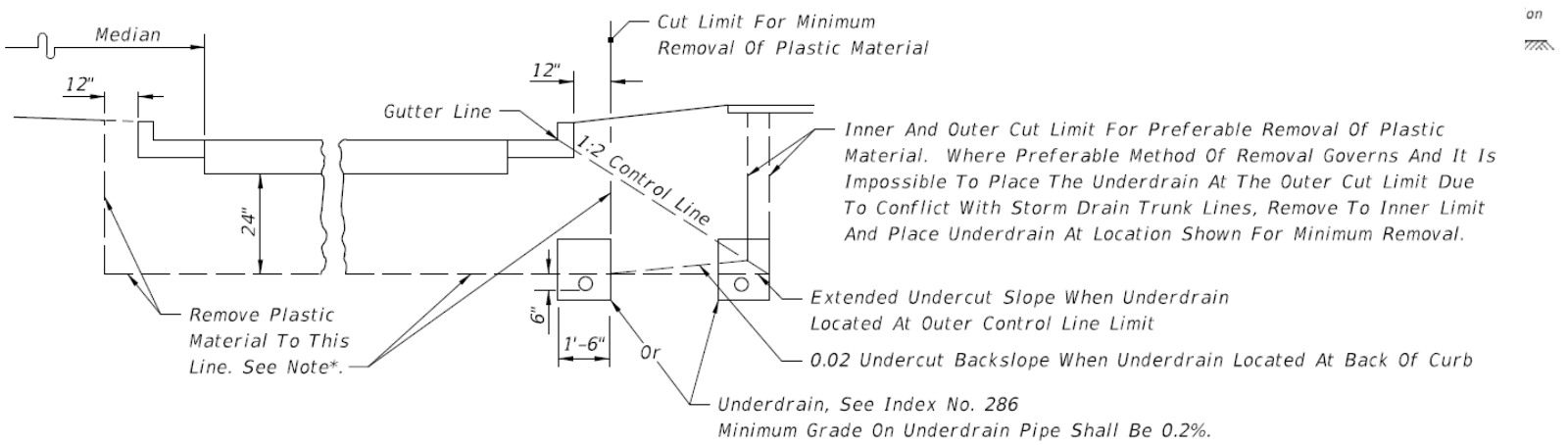
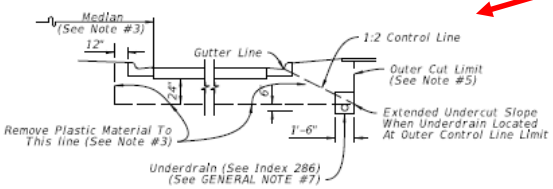
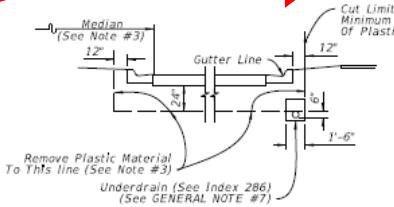
LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2017-18 DESIGN STANDARDS	REMOVAL OF ORGANIC AND PLASTIC MATERIAL	INDEX NO.	SHEET NO.
11/01/16					500	2 of 2



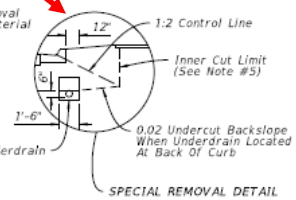
HALF SECTION



PREFERABLE REMOVAL



MINIMUM REMOVAL



SPECIAL REMOVAL DETAIL

CONSTRUCTION AND LOCATION OF UNDERDRAIN IN CURBED ROADWAY
(See Note #4)

NOTES:

1. See Sheet 1 for the GENERAL NOTES.
2. When the typical cut details are applied to minor collectors and local facilities, the undercut may be reduced from 24" to 18".
3. Where frequency of median breaks indicates that it is impractical to leave plastic material in the median, the designer may elect to indicate total removal of this material. If during construction it becomes apparent, due to normal required construction procedures, that it is impractical to leave the plastic material in the median, total removal of this material shall be approved by the Engineer.
4. Refer to roadway cross sections to determine whether minimum or preferable removal is used.
5. Where the Preferable Removal method is shown in the plans and it is impossible to place the underdrain at the Outer Cut Limit due to conflict with storm drain trunk lines, remove to Inner Cut Limit and place underdrain at location shown for Minimum Removal. (See Special Removal Detail)
6. Cross slopes of 0.02 shown above are minimums. Follow the cross slope of the pavement to the extent possible.

REMOVAL OF PLASTIC MATERIAL

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LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2017-18 DESIGN STANDARDS	REMOVAL OF ORGANIC AND PLASTIC MATERIAL	INDEX NO.	SHEET NO.
11/01/16					500	2 of 2

Removed "Design Notes" and Added to PPM, Vol. 1, Chapter 3

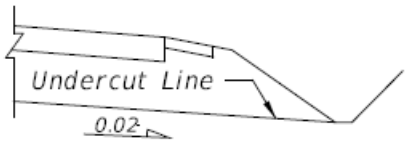
At some locations the complete removal of organic or soft soils may not be practical due to the depth. Review the subsoil excavation with the Geotechnical Engineer of Record and where constructability concerns exist, consult with the District Geotechnical Engineer to review design alternatives. If a geosynthetic reinforced design is selected, refer to ***Chapter 31, Volume 1*** for plan content and design requirements. Additional information concerning geotechnical design can be found in the ***Soils and Foundations Handbook***.

Modification for Non-Conventional Projects:
Delete the above paragraph and see RFP for requirements.

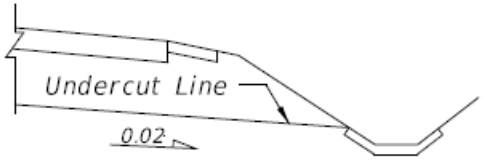
Where subsoil excavation is required due to plastic soils, ensure that adequate drainage of the pavement subgrade is provided. ***Figure 3.5.2*** illustrates the required excavation undercut line (i.e., grade and extent of excavation bottom) for flush shoulder roadways. To accommodate normal undercuts, the side ditches should be at least 3.5 feet below the shoulder break. For curbed roadways, additional subsoil excavation may be needed beyond that shown in ***Figure 3.5.2*** or underdrains must be installed in accordance with ***Design Standards***, ***Index 500***. Coordinate the removal of plastic materials with the Drainage Engineer of Record, as it may affect various drainage design elements including the profile grade of the ditch bottoms.

Also, Removed "Miscellaneous Details" and Added to PPM, Vol. 1, Chapter 3

Figure 3.5.2 Undercut Detail of Plastic Material with Relation to Side Ditches



At locations where plastic material is being removed, the side ditches must be at least as deep as the undercut line to allow subgrade soils to drain.



Where paved side ditches are used in areas of removal of plastic material, the top of the ditch pavement must be below the undercut line.

Design Standards – Index Updates

✓ ***6)*** ***Index 414*** - Type K Temporary Concrete Barrier System

- Revised Asphalt Pad Requirements

✓ ***7)*** ***Index 415*** - Temporary Concrete Barrier

- Revised Asphalt Pad Requirements

✓ ***8)*** ***Index 500*** - Removal of Organic and Plastic Material

- Removed Designer Notes (Added to PPM)
- Updated Details for Clarification

✓ ***9)*** ***Index 514*** - Optional Base Group and Structural Numbers

- Index Deleted
- Flexible Pavement Design Manual/Standard Specifications

Design Standards – Index Updates

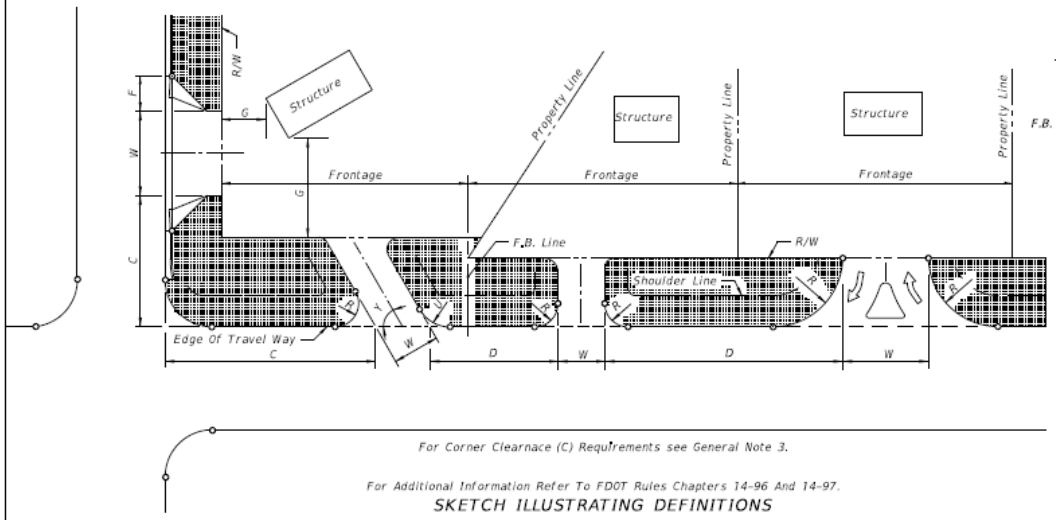
10) ***Index 515*** - Turnouts and Driveways
    - Added "Driveways" to Title for Clarity
    - Changed "Urban" & "Rural" to "Curbed" & "Flush Shoulder"

11) ***Index 516*** - Turnouts - Resurfacing Projects
    - Updated to match ***Index 515*** and removal of *Index 514*

12) ***Index 525*** - Ramp Terminals
    - Clarified Friction Course Location

13) ***Index 530*** - Rest Area Pavilion
    - Updated Steel Spec. Notes and Material References

14) ***Index 546*** - Sight Distance at Intersections
    - Updated for Deletion of ***Index 700***



LEGEND

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

For Corner Clearnace (C) Requirements see General Note 3.

For Additional Information Refer To FDOT Rules Chapters 14-96 And 14-97.

SKETCH ILLUSTRATING DEFINITIONS

ELEMENT DESCRIPTION	CURBED ROADWAYS			FLUSH SHOULDER ROADWAYS		
	1-20 Trips/Day or 1-5 Trips/Hour	21-600 Trips/Day or 6-60 Trips/Hour	601-4000 Trips/Day ◪ or 61-400 Trips/Hour	1-20 Trips/Day or 1-5 Trips/Hour	21-600 Trips/Day or 6-60 Trips/Hour	601-4000 Trips/Day ◪ or 61-400 Trips/Hour
		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 queueing, 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 redefined by Categories under Rule 14-96; and, the term "Class" has been applied to highway segments of the State Highway System as defined under Rule 14-97.

Design Standards – Index Updates

10) ***Index 515*** - Turnouts and Driveways
    - Added "Driveways" to Title for Clarity
    - Changed "Urban" & "Rural" to "Curbed" & "Flush Shoulder"

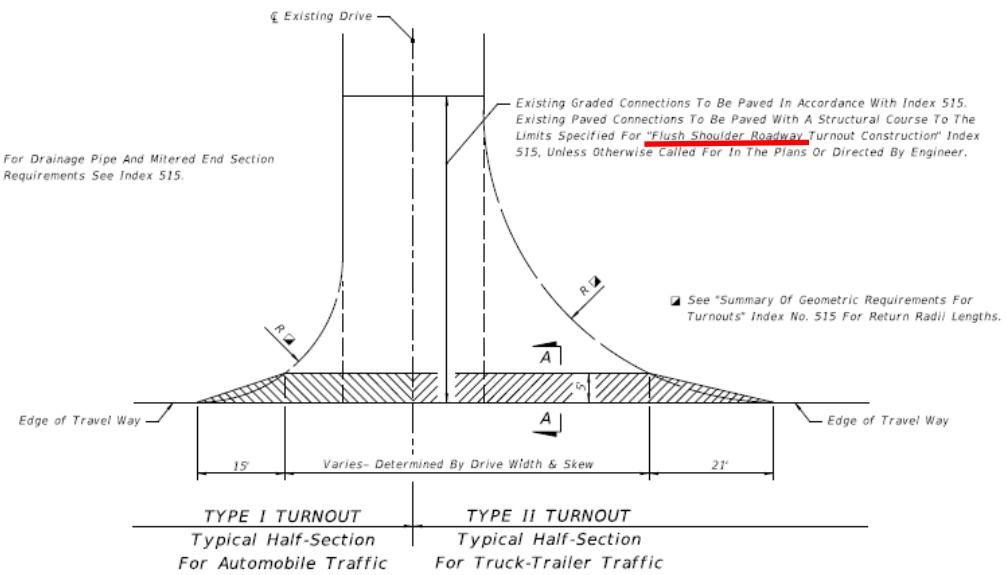
11) ***Index 516*** - Turnouts - Resurfacing Projects
    - Updated to match ***Index 515*** and removal of *Index 514*

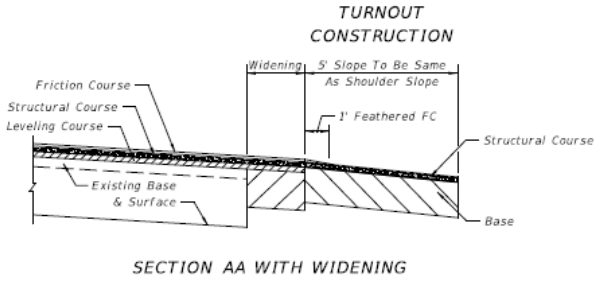
12) ***Index 525*** - Ramp Terminals
    - Clarified Friction Course Location

13) ***Index 530*** - Rest Area Pavilion
    - Updated Steel Spec. Notes and Material References

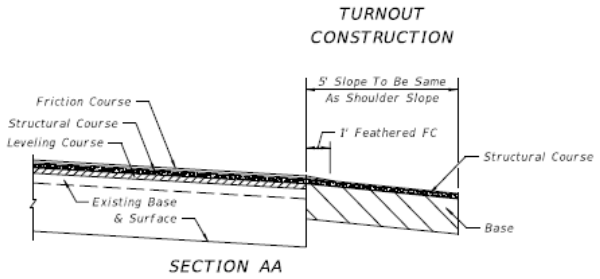
14) ***Index 546*** - Sight Distance at Intersections
    - Updated for Deletion of ***Index 700***

Design Standards – Index 516





SECTION AA WITH WIDENING



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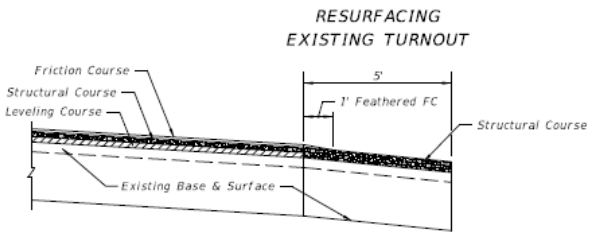

SECTION AA

AREAS FOR ONE 5' DEEP TURNOUT (SY)

Drive Width (Ft.)	Intersection			
	Normal		Skewed	
	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

PAVEMENT STRUCTURE FOR 5' DEEP TURNOUTS

Course	Material	Minimum Thickness
Structural	Asphaltic Concrete	1"
Base	Optional Base (See Spec. Section 285)	O.B.G. 1

Notes:

1. Turnout structural course to be the same material as roadway leveling or structure course. Structural course not required if asphalt base course and its thickness increased to match edge of roadway pavement.
2. Any Department-approved pavement structure equivalence may be used at the discretion of the Engineer.
3. Additional structural strength may be required if heavy truck loads are anticipated.

GENERAL NOTES

1. Turnouts are to be constructed or resurfaced for low volume (single family, duplex, farm, etc.) residential connections as directed by the Engineer.
2. Turnout construction is not required for low volume residential connections where roadway shoulders are paved.
3. Connections outside the 5' limit are to be constructed as directed by the Engineer.
4. The contract unit price for Turnout Construction includes the cost for excavation and base.
5. Payment for structural course is to be included in roadway resurfacing pay item.
6. Payment for feathering friction course is to be included in the unit price for Asphaltic Concrete Friction Course placed on the roadway. Feathered areas will not be included in measured quantities. Feathering is not required for FC-5 friction course.

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LAST REVISION 11/01/16	REVISION	DESCRIPTION:	FDOT FY 2017-18 DESIGN STANDARDS	TURNOUTS RESURFACING PROJECTS	INDEX NO. 516	SHEET NO. 1 of 1

Design Standards – Index Updates

10) ***Index 515*** - Turnouts and Driveways
- Added "Driveways" to Title for Clarity
- Changed "Urban" & "Rural" to "Curbed" & "Flush Shoulder"

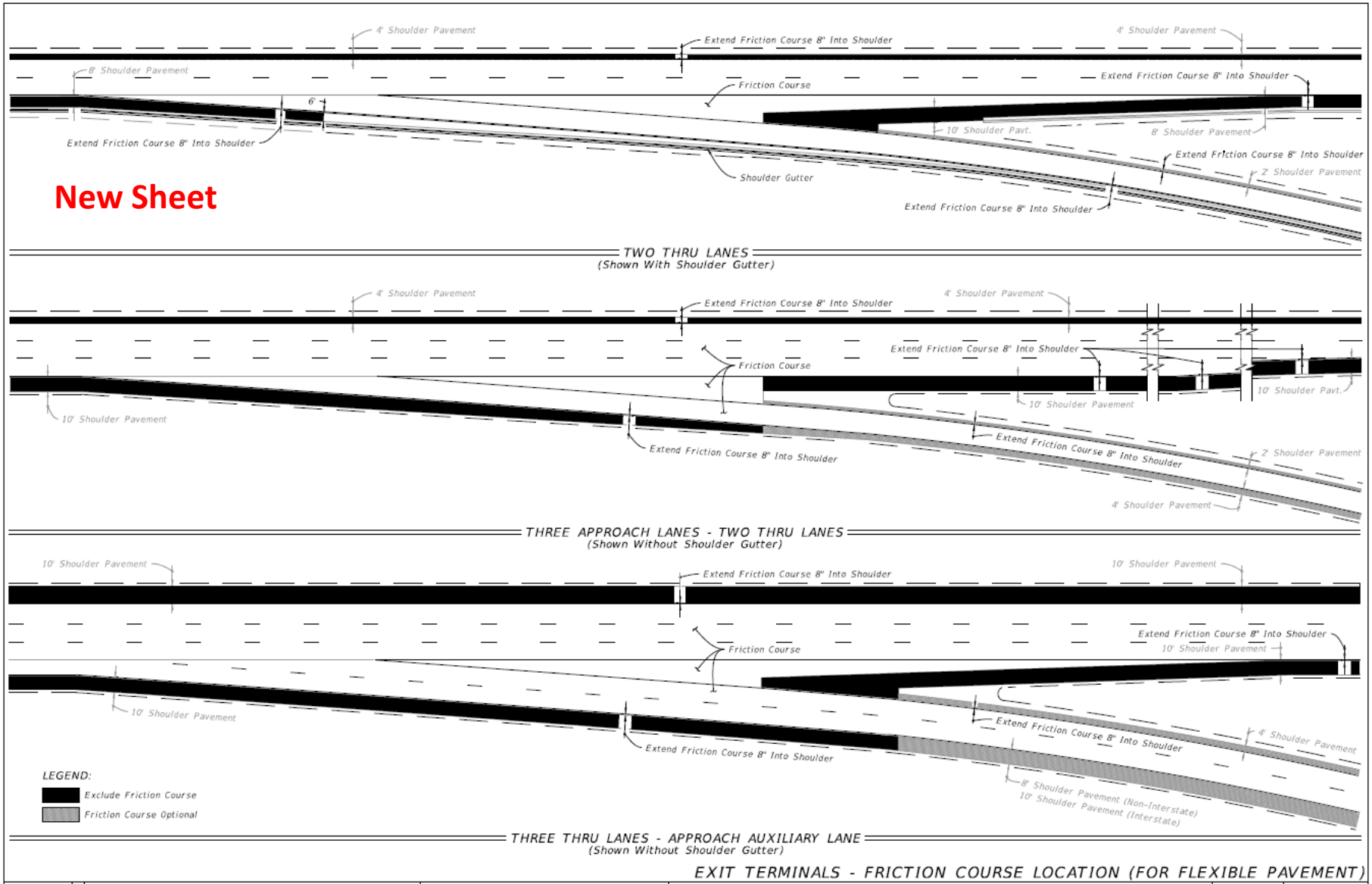
11) ***Index 516*** - Turnouts - Resurfacing Projects
- Updated to match ***Index 515*** and removal of *Index 514*

12) ***Index 525*** - Ramp Terminals
- Clarified Friction Course Location

13) ***Index 530*** - Rest Area Pavilion
- Updated Steel Spec. Notes and Material References

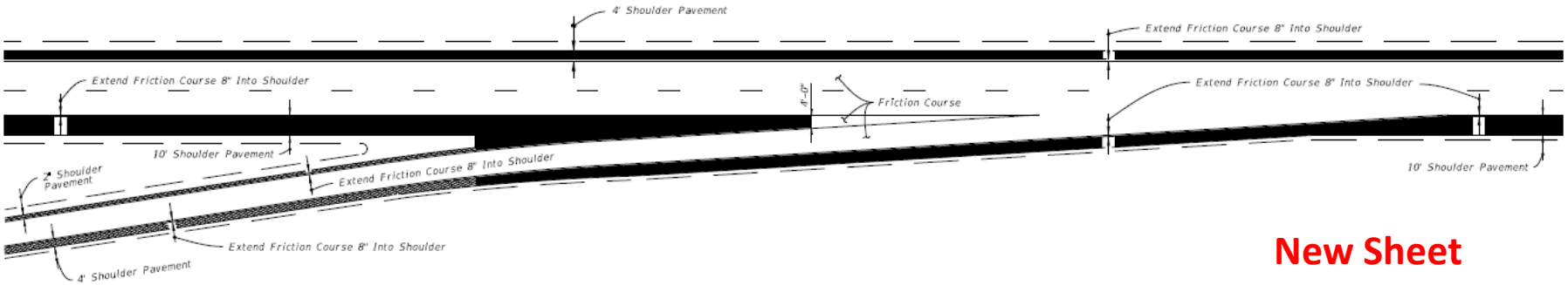
14) ***Index 546*** - Sight Distance at Intersections
- Updated for Deletion of ***Index 700***

Design Standards – Index 525



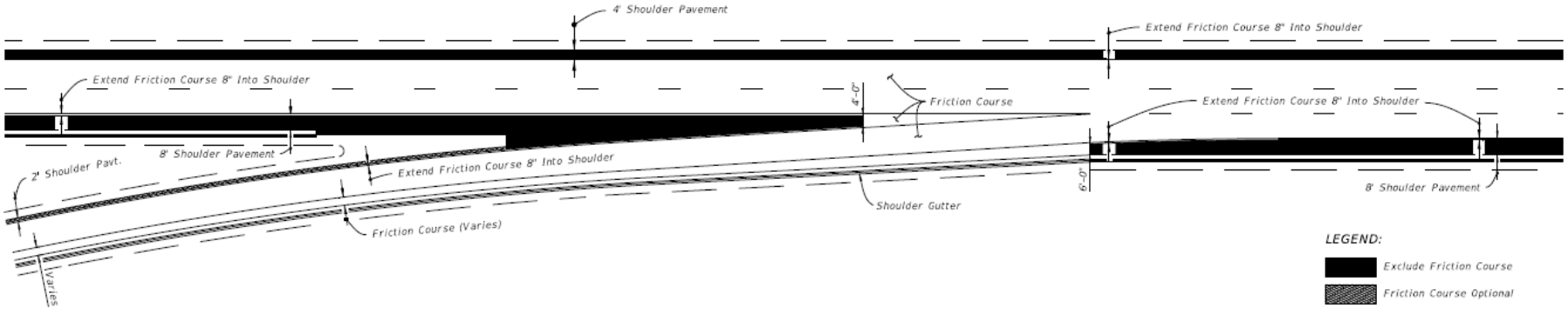
LAST REVISION 11/01/16	REVISION	DESCRIPTION:	FDOT FY 2017-18 DESIGN STANDARDS	RAMP TERMINALS	INDEX NO. 525	SHEET NO. 3 of 5

Design Standards – Index 525



New Sheet

TAPER - TYPE ENTRANCE
(Shown Without Shoulder Gutter)



PARALLEL - TYPE ENTRANCE
(Shown With Shoulder Gutter)

ENTRANCE TERMINALS - FRICTION COURSE LOCATION (FOR FLEXIBLE PAVEMENT)

LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2017-18 DESIGN STANDARDS	RAMP TERMINALS	INDEX NO.	SHEET NO.
11/01/16					525	5 of 5

10/12/2016 11:00:02 AM

Design Standards – Index Updates

✓ ***10) Index 515*** - Turnouts and Driveways

- Added “Driveways” to Title for Clarity
- Changed “Urban” & “Rural” to “Curbed” & “Flush Shoulder”

✓ ***11) Index 516*** - Turnouts - Resurfacing Projects

- Updated to match ***Index 515*** and removal of *Index 514*

✓ ***12) Index 525*** - Ramp Terminals

- Clarified Friction Course Location

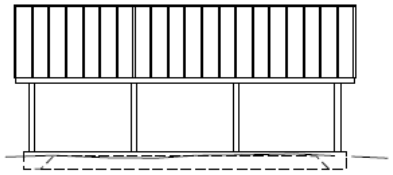
13) Index 530 - Rest Area Pavilion

- Updated Steel Spec. Notes and Material References

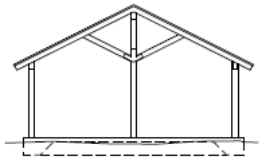
14) Index 546 - Sight Distance at Intersections

- Updated for Deletion of ***Index 700***

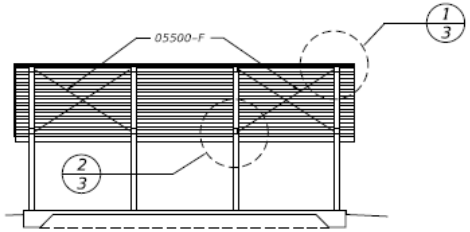
Design Standards – Index 530



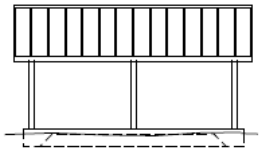
A/3 SIDE ELEVATION



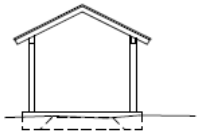
B/3 END ELEVATION



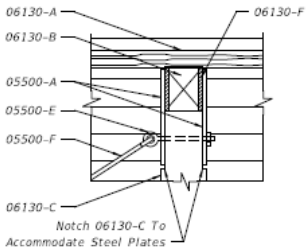
C/3 SECTION



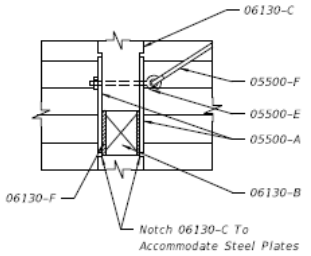
D/3 SIDE ELEVATION



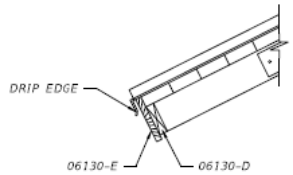
E/3 END ELEVATION



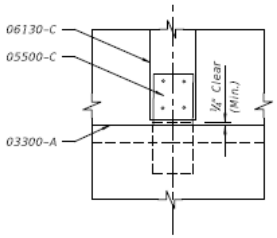
1/3 DETAIL



2/3 DETAIL



3/3 DETAIL
Similar At Roof Rake



4/3 DETAIL

SPECIFICATIONS

Keynotes On Sheet 2.

CONCRETE

Concrete: FDOT Class II.

Reinforcing Bars: ASTM A615, Grade 60.

Welded Wire Fabric: ASTM A-185.

Vapor Barrier: Black 6-Mil Polyethylene.

STEEL

Galvanized Steel Plate: Steel Plate ASTM A36 or A709, in accordance with the requirements of ASTM A123.

Galvanized Fasteners: High-Strength bolts and nuts, in accordance with Specification Section 962.

Make field repairs to galvanizing in accordance with Specification 562.

WOOD

Comply with American Institute For Timber Construction AITC 108, "Standard For Heavy Timber Construction."

For solid wood decking, comply with AITC 112, "Standard For Tongue And Groove Heavy Timber Standard."

Species: Douglas Fir, Hem-fir, or Southern Pine, at fabricator's option.

Preservative Treatment: Pressure treat fabricated members with waterborne solution for above ground use, complying with AWPA U1, category UC3B above ground exposed.

Wood Decking: Predrill decking at 30" centers for lateral spiking to adjacent units. Spikes to be 8" spikes galvanized common.

LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2017-18 DESIGN STANDARDS	REST AREA PAVILION	INDEX NO.	SHEET NO.
11/01/16					530	3 of 3

10/12/2016 11:02:55 AM

Design Standards – Index Updates

- ✓ ***10) Index 515*** - Turnouts and Driveways
  - Added “Driveways” to Title for Clarity
  - Changed “Urban” & “Rural” to “Curbed” & “Flush Shoulder”
- ✓ ***11) Index 516*** - Turnouts - Resurfacing Projects
  - Updated to match ***Index 515*** and removal of *Index 514*
- ✓ ***12) Index 525*** - Ramp Terminals
  - Clarified Friction Course Location
- ✓ ***13) Index 530*** - Rest Area Pavilion
  - Updated Steel Spec. Notes and Material References
- ***14) Index 546*** - Sight Distance at Intersections
  - Updated for Deletion of ***Index 700***

DESIGN NOTES

1. The information shown on this index is intended solely for the purpose of clear sight development and maintenance at intersecting highways, roads, streets and driveways, and is not intended to be used to establish roadway and roadside safety except as related to clear sight corridors. An analysis of sight distance shall be documented for all intersections.

2. For the purpose of this Index, Minor Road is defined as all intersecting highways, roads, streets and driveways.

3. Details are based on the AASHTO 'A Policy On Geometric Design Of Highways And Streets, 2001', CHAPTER 9, INTERSECTION SIGHT DISTANCE, CASES B and F, and Department practices for channelized median openings (left turns from major road).

4. The minimum driver eye setback of 14.5' from the edge of the traveled way may be adjusted on any intersection leg only when justified by a documented, site specific field study of vehicle stopping position and driver eye position.

5. For SIGNALIZED INTERSECTIONS sight distances should be developed based on AASHTO 'Case D–Intersections With Traffic Signal Control'. 'At signalized intersections, the first vehicle stopped on one approach should be visible to the driver of the first vehicle stopped on each of the other approaches. Left turning vehicles should have sufficient sight distance to select gaps in oncoming traffic and complete left turns. Apart from these sight conditions, there are generally no other approach or departure sight triangles needed for signalized intersections. However, if the traffic signal is to be placed on two-way flashing operation (i.e. flashing yellow on the major road approaches and flashing red on the minor road approaches) under off peak or nighttime conditions, then the appropriate departure sight triangles for Case B, both to the left and to the right, should be provided for the minor road approaches. In addition, if right turns on a red signal are to be permitted from any approach, then the appropriate departure sight triangle to the left for Case B2 should be provided to accommodate right turns from that approach.'

6. Where curvature, superelevation, adverse split profiles or other conditions preclude the use of standard tree sizes and spacing, proof of view and shadowing restraints must be documented and the size and location of trees in medians detailed in the plans.

7. Intersection sight distance values are provided for Passenger Vehicles, SU Vehicles and Combination Vehicles. Intersection sight distance based on the Passenger Vehicle is suitable for most intersections. Where substantial volumes of heavy vehicles enter the major road, such as from ramp terminals with stop control or roadways serving truck terminals, the use of tabulated values for SU Vehicles or Combination Vehicles should be considered.

GENERAL NOTES

1. Details apply to both rural and urban intersections under stop sign control or flashing beacon control. For full signal controlled intersections see Design Note No 4. At intersections listed in the Department's High Crash Intersection Report, designers shall give attention to keeping to a minimum, objects that distract or affect sight distance.

2. Sight distance 'd' applies to normal and skewed intersections (intersecting angles between 60° and 120°), and where vertical and/or horizontal curves are not present. Sight distance 'd' is measured along the major road from the center of the entrance lane of the minor road to the center of the near approach lane (right or left) of the major road. Distances 'd_L' and 'd_r' are measured from the centerline of the entrance lane of the minor road to a point on the edge of the near side outer traffic lane on the major road. Distance 'd_m' is measured from the centerline of the entrance lane of the minor road to a point on the median clear zone limit or horizontal clearance limit for the far side road of the major road.

3. A. The limits of clear sight define a corridor throughout which a clear sight window must be preserved. See WINDOW DETAIL, Sheet 2.

   B. Clear sight must be provided between vehicles at intersection stop locations, and vehicles on the major road within dimension 'd'.

   C. Since observations are made in both directions along the line of sight, the reference datum between roadways is 3'–6" above respective pavements.

4. Barrier systems within intersection sight corridors, where penetration into the sight window might occur, shall be located to provide the least adverse affect practical.

5. The corridor defined by the limits of clear sight is a restricted planting area. Drivers of vehicles on the intersecting road and vehicles on the major road must be able to see each other clearly throughout the limits of 'd' and 'd_a'. If in the Engineers judgement, landscaping interferes with the line of sight corridor prescribed by these standards the Engineer may rearrange, relocate or eliminate plantings. Plants within the restricted areas are limited to selections as follows:

5. (Cont.)
Ground Cover & Trunked Plants (Separate or Combined):

Ground Covers – Plant selection of low growing vegetation which at maturity does not attain a height greater than 18" below the sight line datum. For ground cover in combination with trees and palms; the following heights below the sight line datum will apply:

24" for trees and palms ≤ 11" dia.; and, 18" for sabal palms >11" but ≤ 18" dia. (dia.–within Sight Window).

Trunked Plants – Plant selection of a mature trunk diameter 4" or less measured at 6" above the ground. Canopy or high borne foliage shall never be lower than 5' above the sight line datum. These selections shall be spaced no closer than 20'.

Trees – Trees can be installed with sod; pavers; gravel, mulch; ground covers or other Department-approved material. The clear sight window must be in conformance with the 'WINDOW DETAIL' modified to attain the height requirements listed in 'Ground Covers' above.

A. Size and spacing shall conform to the Tree Spacing Table.

B. Requirements for placement within medians at median openings and at unsignalized and signalized intersections:

   a. The lateral offset of the mature specimen must be maintained as specified in the PPM, Vol. 1, Chapter 4. Specimens whose mature trunk diameter is greater than 18" shall not be permitted,

   b. Where left turns from the major road are permitted, no trees shall be located within the distance 'd_b', Sheet 2 of 6; and not less than the distances called for in (c) or (d), as applicable,

   c. For safety, these additional setbacks are required:

      1. Where no left turn lane is present, size and spacing shall conform to the Tree Spacing Table. No trees shall be permitted within 100' of the restricted median nose (measured from the edge of pavement),

      2. Where left turn lane(s) are present, the following requirements apply:

         - For low speed facilities (design speed less than 50 mph), size and spacing shall conform to the Tree Spacing Table. No trees shall be permitted within 100' of the restricted median nose (measured from the edge of pavement).

         - For high speed facilities (design speed 50 mph or greater), no trees shall be permitted within 200' of the restricted median nose. Beyond this limit, size and spacing shall conform to the Tree Spacing Table.

TREE SPACING TABLE **

Description	Design Speed (mph)													
	30		35		40		45		50		55		60	
Diameter (Within Limits Of Sight Window)	(Inches)													
	>4≤11	>11≤18	>4≤11	>11≤18	>4≤11	>11≤18	>4≤11	>11≤18	>4≤11	>11≤18	>4≤11	>11≤18	>4≤11	>11≤18
	(Feet)													
Minimum Spacing (c. to c. Of Trunk)	25	90	30	105	35	120	40	135	50	150	55	165	60	180

** Sizes and spacings are based on the following conditions:

a. A single line of trees in the median parallel to but not necessarily colinear with the centerline.

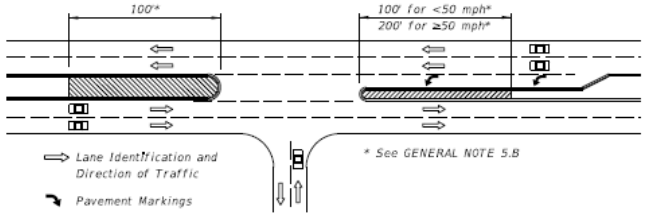
b. A straight approaching mainline, within skew limits as described in No. 2 above.

c. 1. Trees and palms ≤ 11" in diameter casting a vertical 6' wide shadow band on a vehicle entering at stop bar location when viewed by mainline driver beginning at distance 'd'; see SHADOW DIAGRAM, Sheet 2.

   2. Sabal palms with diameters > 11" ≤ 18" spaced at intervals providing a 2 second full view of entering vehicle at stop bar location when viewed by the mainline driver beginning at distance 'd'; see PERCEPTION DIAGRAM, Sheet 2.

d. Trees with diameters ≤ 11" intermixed with trees with diameters > 11" ≤ 18" are to be spaced based on trees with diameters > 11" ≤ 18".

For any other conditions the tree sizes, spacings and locations shall be detailed in the plans; see Design Note 5.



PLAN
Special Areas Limited to Ground Cover

Design Standards – Index Updates

- ✓ ***10) Index 515*** - Turnouts and Driveways
  - Added “Driveways” to Title for Clarity
  - Changed “Urban” & “Rural” to “Curbed” & “Flush Shoulder”
- ✓ ***11) Index 516*** - Turnouts - Resurfacing Projects
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- ✓ ***12) Index 525*** - Ramp Terminals
  - Clarified Friction Course Location
- ✓ ***13) Index 530*** - Rest Area Pavilion
  - Updated Steel Spec. Notes and Material References
- ✓ ***14) Index 546*** - Sight Distance at Intersections
  - Updated for Deletion of ***Index 700***

Design Standards – Index Updates

15) ***Index 700*** - Roadside Offsets
- Index Deleted
- Plans Preparation Manual (PPM)

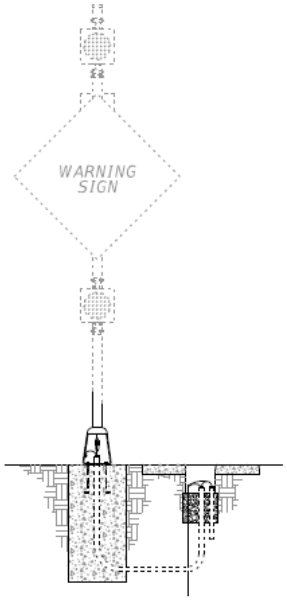
16) ***Index 11862*** - Roadside Flashing Beacon Assembly
- Reorganized Index for Clarity
- Included/Revised Callout/Dimensions As-needed

17) ***Index 17349*** - Traffic Controls for Street Terminations
- Revised Sign Placement for Consistency

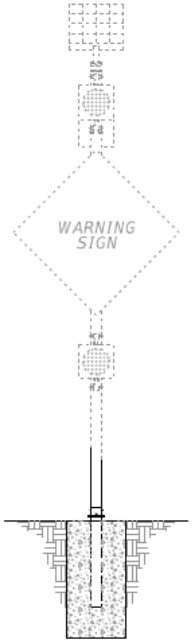
18) ***Index 17354*** - Tourist Oriented Directional Signs
- Revised Index for Clarity & Consistency

19) ***Index 17882*** - Railroad Grade Crossing Traffic Control Devices
- Added “Class” Differences to General Notes

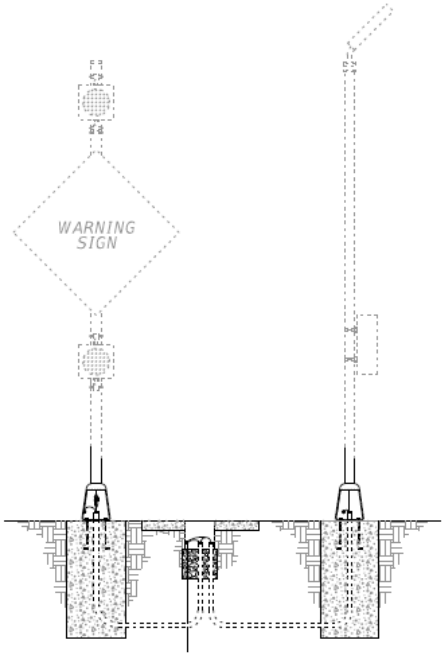
Design Standards – Index 11862



CONVENTIONAL POWERED BEACON
(With Transformer Base & Pull Box)



SOLAR POWERED BEACON
(With Slip Base)



SOLAR POWERED BEACON WITH AUXILIARY POLE
(With Transformer Base & Pull Box)

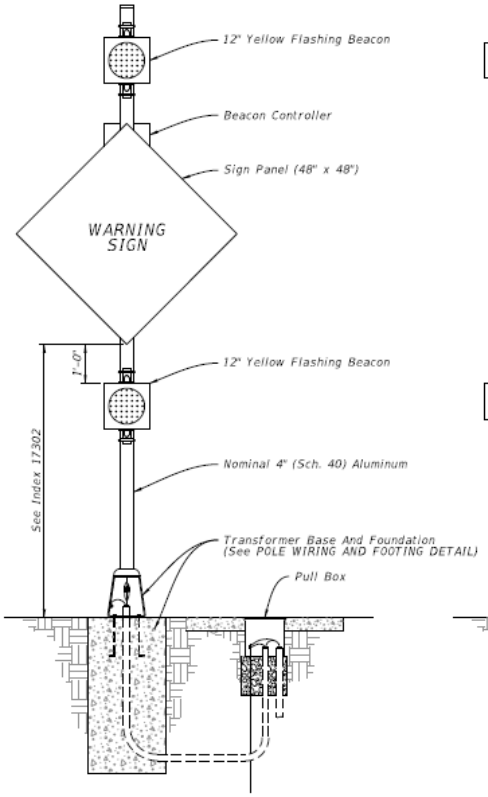
GENERAL NOTES:

1. Use aluminum materials that meets the requirements of Aluminum Association Alloy 6061-T6 (ASTM B209, B221, B308 or B429), except as noted in the Plans.
2. Install sign panel, wind beam and columns in accordance with Index 11860 and Specifications 700.
3. Install sign column so that the height and offset are in accordance with Index 17302.
4. When aluminum column (post) are installed with a frangible transformer bases, engage all threads on the transformer base and post unless the aluminum post is fully seated into base.
5. Meet the requirements of Specifications 646 for aluminum poles and transformer bases.
6. Install a concrete slab around all flashing beacon assemblies on slopes 6:1 or greater. The minimum slab dimension is 4'-0" by 5'-0".
7. Install a concrete slab around all pull boxes. The minimum slab dimension is 4'-0" by 4'-0". In urban areas where space is limited slab dimensions may be adjusted as shown in the plans.
8. For beacon assemblies connected to conventional power, provide single pole non-fused watertight breakaway electrical connectors in the frangible transformer base.
9. Install the connection of controller cabinet and solar panel to the column in accordance with manufacturer's recommendations.
10. When wire entry holes are drilled in the sign column, use a bushing or rubber grommet to protect conductors.
11. Orient solar panel to face South for optimal exposure to sunlight.

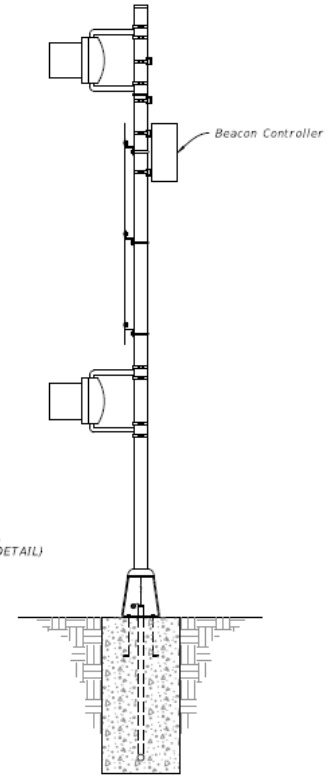
10/14/2016 8:04:10 AM

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2017-18 DESIGN STANDARDS	ROADSIDE FLASHING BEACON ASSEMBLY	INDEX NO.	SHEET NO.
11/01/16						11862	1 of 8

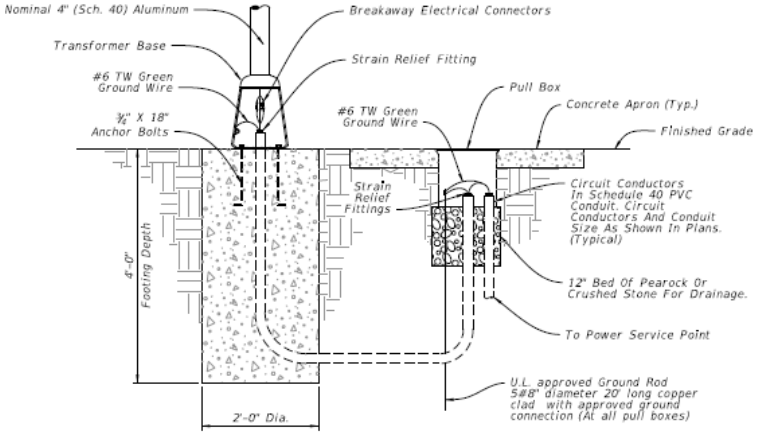
Design Standards – Index 11862



FRONT VIEW



SIDE VIEW

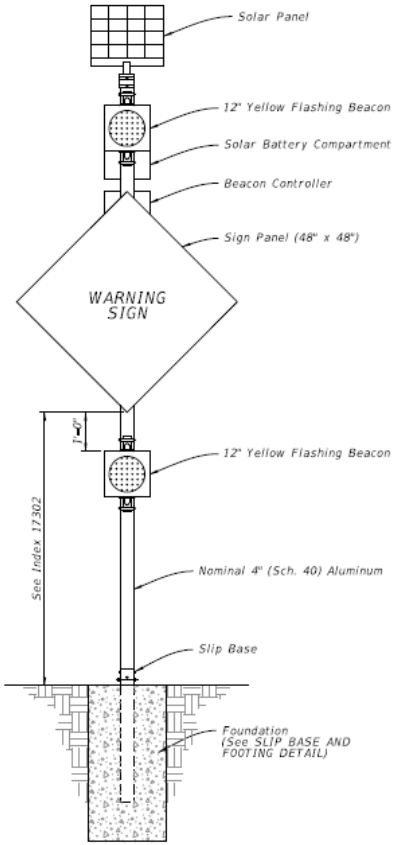


POLE WIRING AND FOOTING DETAIL

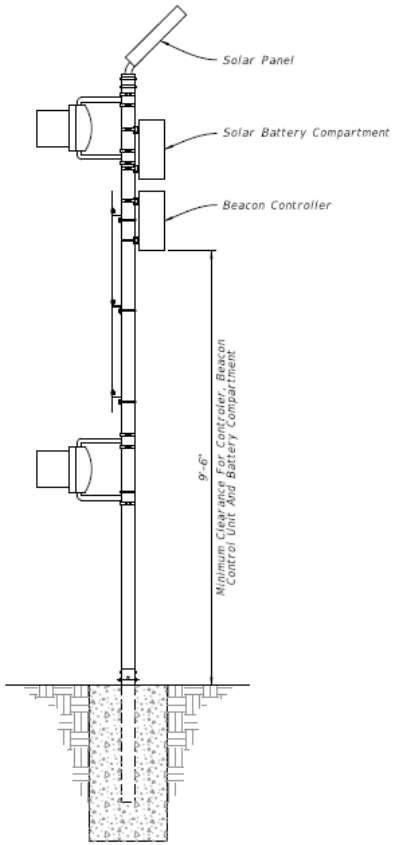
CONVENTIONAL POWERED WARNING SIGN DETAILS

LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2017-18 DESIGN STANDARDS	ROADSIDE FLASHING BEACON ASSEMBLY	INDEX NO.	SHEET NO.
11/01/16					11862	2 of 8

10/14/2016 8:04:13 AM



FRONT VIEW

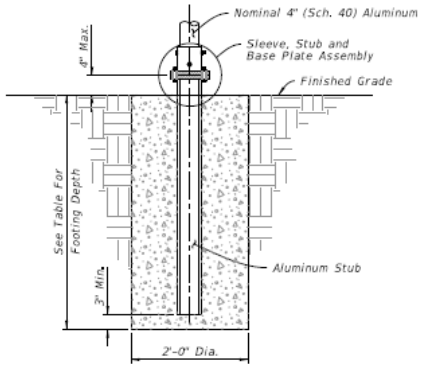


SIDE VIEW

TABLE 1 STANDARD WARNING SIGN COLUMN SIZE			
Wind Speed	Sign Height	Column Size	Footing Depth
110	7'	4"	4'
130	7'	4.5"	4'
150	7'	5"	4.5'
110	8.5'	4.5"	4'
130	8.5'	5"	4.5'
150	8.5'	6"	5'

NOTES:

1. Install the sign column slip base in accordance with Index 11860.
2. Use beacon and beacon controllers that are listed on the Approved Products List (APL).
3. Details show a typical warning sign with two flashing beacon heads. When only one beacon is required, install upper beacon.

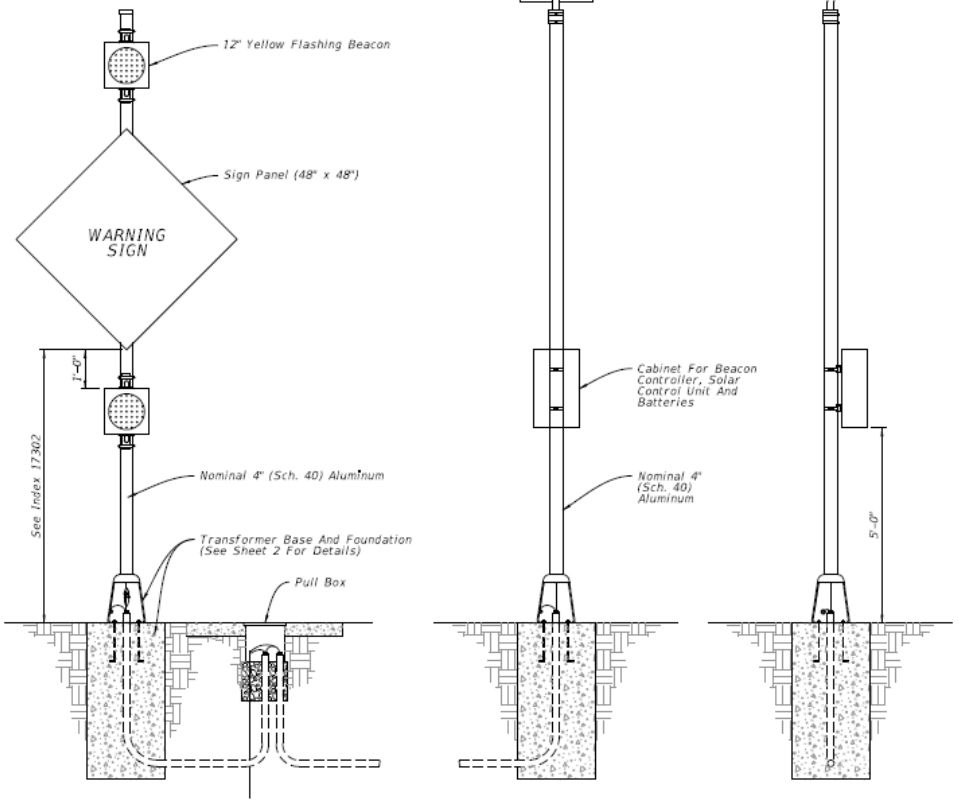


SLIP BASE AND FOOTING DETAIL

SOLAR POWERED WARNING SIGN DETAILS

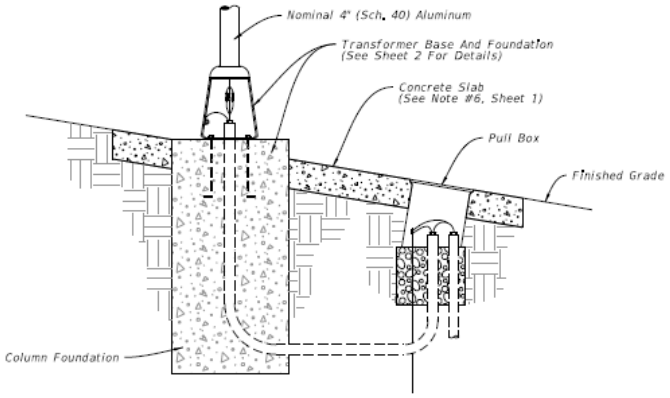
LAST REVISION 11/01/16	REVISION	DESCRIPTION:	FDOT FY 2017-18 DESIGN STANDARDS	ROADSIDE FLASHING BEACON ASSEMBLY	INDEX NO. 11862	SHEET NO. 3 of 8

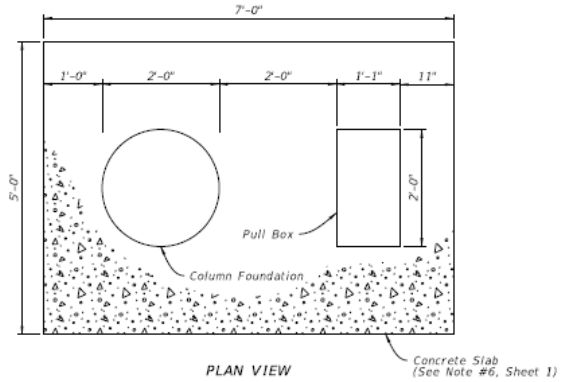
10/14/2016 8:04:15 AM



NOTES:

1. Install a separate pole for mounting the solar panel, controller and batteries for all flashing beacon assemblies with solar panels, controllers and batteries weighing more than 170 lbs.
2. Install the auxiliary pole as close to the right of way as possible.
3. Install the auxiliary pole so that the height is the same as the column for the beacon assembly.
4. Payment for the separate pole, foundation, conduit and wiring are included in the cost of the electronic warning sign with flashing beacon.





SOLAR POWERED BEACON WITH AUXILIARY POLE AND CONCRETE SLAB DETAIL

LAST REVISION	REVISION	DESCRIPTION:			INDEX NO.	SHEET NO.
11/01/16			FDOT FY 2017-18 DESIGN STANDARDS	ROADSIDE FLASHING BEACON ASSEMBLY	11862	4 of 8

10/14/2016 8:04:17 AM

Design Standards – Index Updates

15) ***Index 700*** - Roadside Offsets
- Index Deleted
- Plans Preparation Manual (PPM)

16) ***Index 11862*** - Roadside Flashing Beacon Assembly
- Reorganized Index for Clarity
- Included/Revised Callout/Dimensions As-needed

17) ***Index 17349*** - Traffic Controls for Street Terminations
- Revised Sign Placement for Consistency

18) ***Index 17354*** - Tourist Oriented Directional Signs
- Revised Index for Clarity & Consistency

19) ***Index 17882*** - Railroad Grade Crossing Traffic Control Devices
- Added “Class” Differences to General Notes

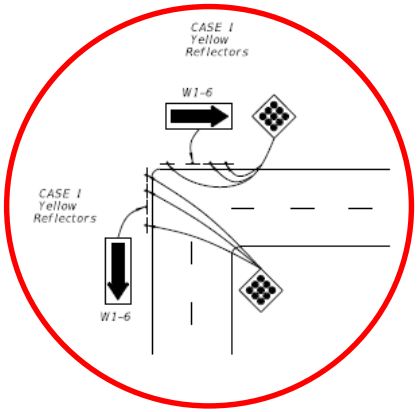
Design Standards – Index 17349

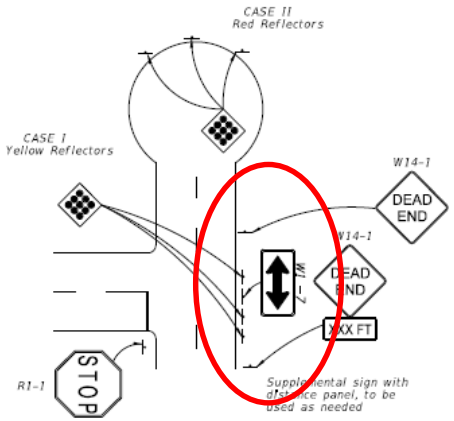
CASE I Type 1 Object Markers shall consist of nine yellow reflectors mounted on a yellow reflective background or consist of a retroreflective panel of the same size.

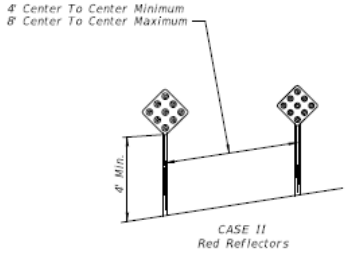
CASE II End of Road Markers shall consist of nine red reflectors mounted on a red reflective background or consist of a retroreflective panel of the same size.

NOTES:

1. This index applicable to residential and minor streets only. Major streets to be evaluated on a case by case basis.
2. "T"-intersection-Two-Way arrows and reflectors are optional. The need should be based on a review of each location.
3. For additional details on aluminum round post, sign panel material and bolts, nuts and washers see Index Nos. 11860.
4. Case I Installation – The arrow panels and object markers shall be located approximately 20', but not less than 12' from the edge of the travel lane.
5. Dead end sign shall be posted a sufficient advance distance to permit the vehicle operator to avoid the dead end by turning off, if possible, at the nearest intersecting street.
6. For pavement marking see Index No. 17346
7. No guardrail is required unless special field conditions require its use.







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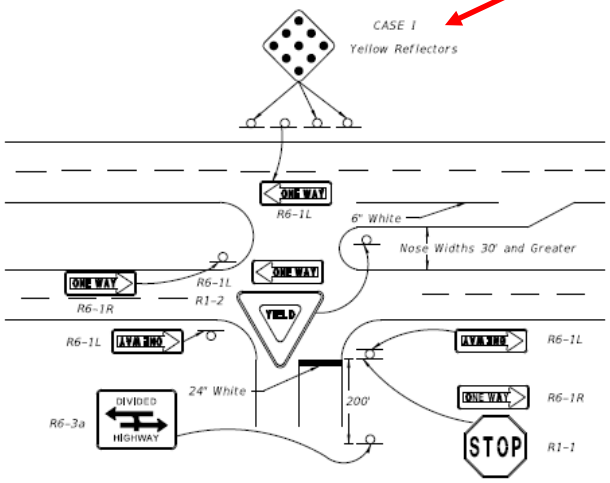
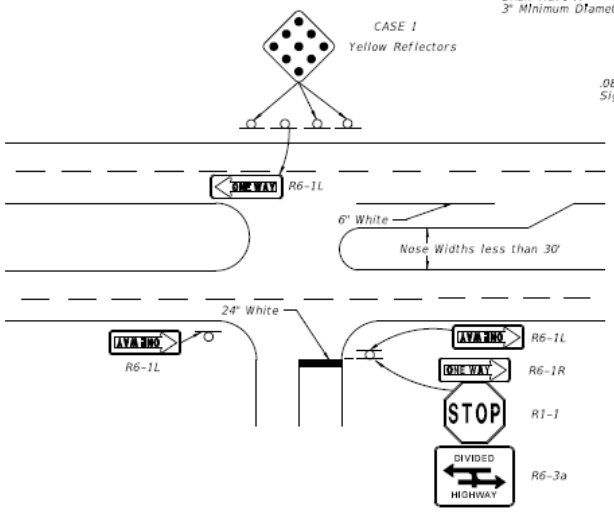
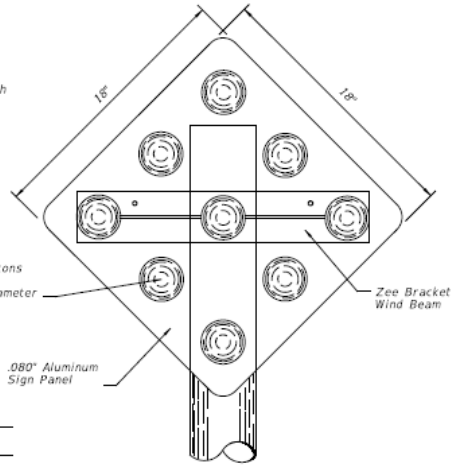






Object markers shall be installed on 2" Ø x ⅛" Aluminum Round Post. ⅜" Ø Aluminum Button Head Bolt with Nut and Lockwasher or 5/16" Ø Stainless Steel Hex Head Bolt with Flat Washer under Head and Lockwasher under Nut. Post foundation shall be installed in accordance with Index No. 11860.

LAST REVISION 11/01/16	REVISION	DESCRIPTION:	FDOT FY 2017-18 DESIGN STANDARDS	TRAFFIC CONTROLS FOR STREET TERMINATIONS	INDEX NO. 17349	SHEET NO. 1 of 1

10/14/2016 8:40:44 AM

Design Standards – Index Updates

15) ***Index 700*** - Roadside Offsets
- Index Deleted
- Plans Preparation Manual (PPM)

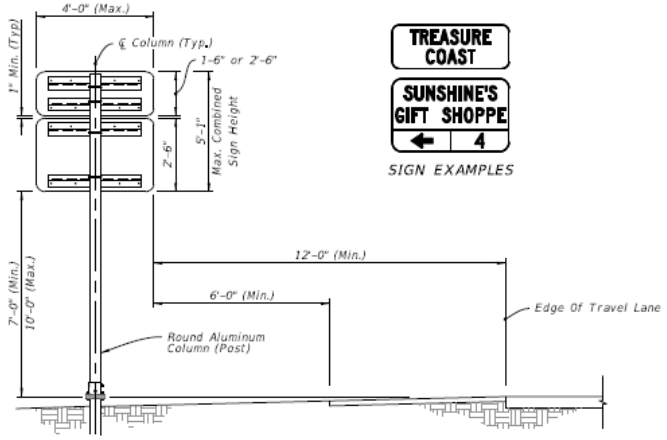
16) ***Index 11862*** - Roadside Flashing Beacon Assembly
- Reorganized Index for Clarity
- Included/Revised Callout/Dimensions As-needed

17) ***Index 17349*** - Traffic Controls for Street Terminations
- Revised Sign Placement for Consistency

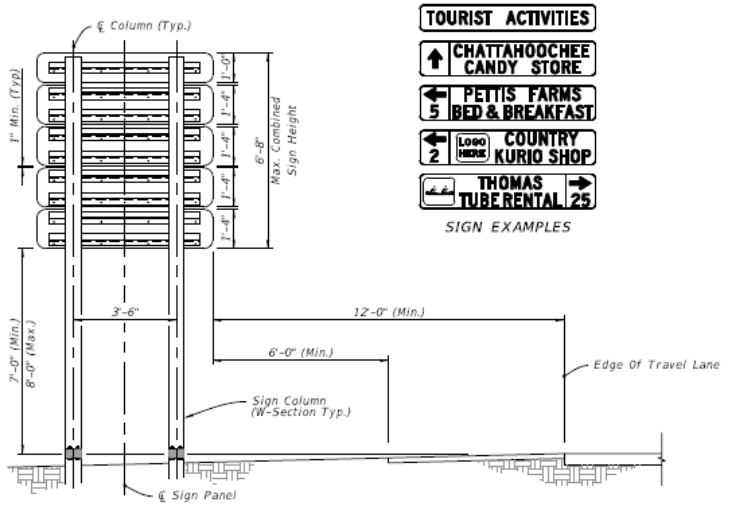
18) ***Index 17354*** - Tourist Oriented Directional Signs
- Revised Index for Clarity & Consistency

19) ***Index 17882*** - Railroad Grade Crossing Traffic Control Devices
- Added “Class” Differences to General Notes

Design Standards – Index 17354



SINGLE COLUMN GROUND SIGN



MULTI-COLUMN GROUND SIGN

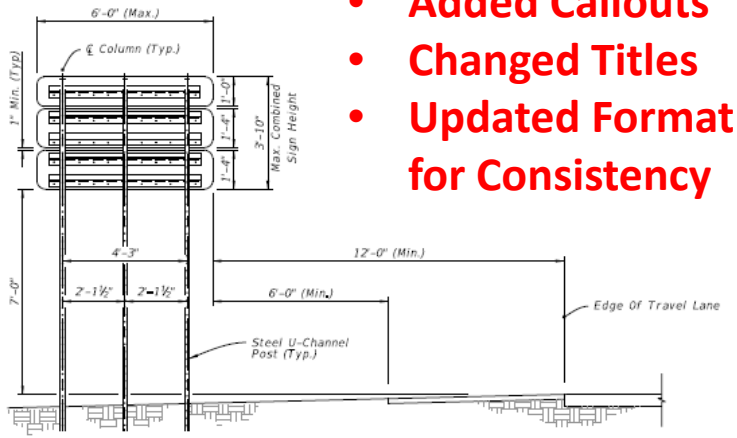
NOTES:

1. Signs must comply with Rule 14-51, Florida Administrative Code.
2. Use 6" Type C lettering.
3. See index 11860 for Single Column Ground Sign for foundation and conection details.
4. See Index 11200 for Multi-Coulmn Ground Sign for foundation and connection details.
5. See Index 600, Work Zone Sign Supports, for Temporary 3-Post Sign Support assembly and foundation details. Galvanize Steel U-Channel in accordance with ASTM 123.

DESIGN FOR TOURIST ORIENTED DIRECTIONAL SIGNS
(Options for Aluminum Round Tube, Steel I Beam and Steel U-Channel.)

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

* Limited to 22 SF Total Sign Area.



TEMPORARY 3 POST SIGN SUPPORT

- **Added Callouts**
- **Changed Titles**
- **Updated Format for Consistency**

10/14/2016 8:42:45 AM

LAST REVISION 11/01/16	REVISION	DESCRIPTION:	FDOT FY 2017-18 DESIGN STANDARDS	TOURIST ORIENTED DIRECTIONAL SIGNS	INDEX NO. 17354	SHEET NO. 1 of 1

Design Standards – Index Updates

✓ ***15) Index 700*** - Roadside Offsets
- Index Deleted
- Plans Preparation Manual (PPM)

✓ ***16) Index 11862*** - Roadside Flashing Beacon Assembly
- Reorganized Index for Clarity
- Included/Revised Callout/Dimensions As-needed

✓ ***17) Index 17349*** - Traffic Controls for Street Terminations
- Revised Sign Placement for Consistency

→ ✓ ***18) Index 17354*** - Tourist Oriented Directional Signs
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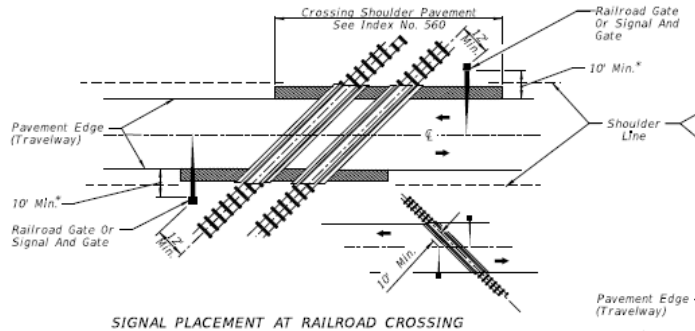
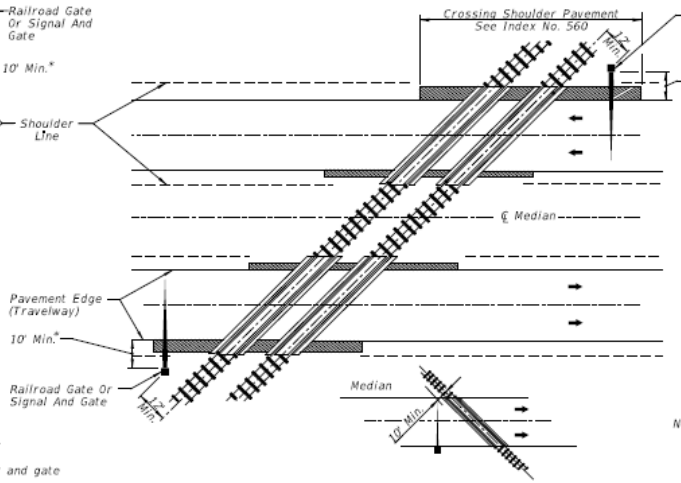
19) Index 17882 - Railroad Grade Crossing Traffic Control Devices
- Added “Class” Differences to General Notes

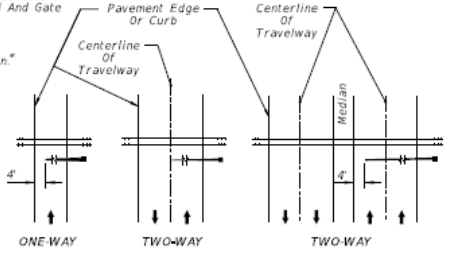
Design Standards – Index 17882



SIGNAL PLACEMENT AT RAILROAD CROSSING
(2 - LANE DESIGN)



SIGNAL PLACEMENT AT RAILROAD CROSSING
(4 - LANE DESIGN)



Note:
Arrows denote direction of travel not pavement markings.
Gate Length Requirements See Note 5 Sheet 3.

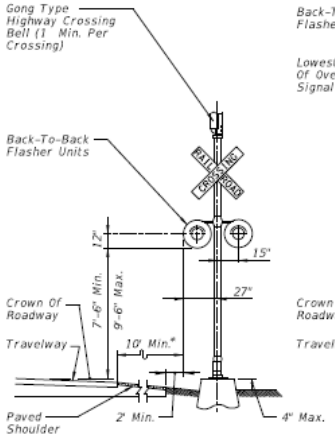
FIGURE 1

GENERAL NOTES:

1. No guardrail is proposed for signals; however, some form of impact attenuation device may be specified for certain locations.
2. Advance flasher to be installed when and if called for in plans or specifications.
3. Top of foundation shall be no higher than 4" above finished shoulder grade.
4. Type of traffic control device
   I Flashing warning devices
   II Flashing warning devices with cantilever
   III Flashing warning devices with gate
   IV Flashing warning devices with cantilever and gate
   V Gate
5. Class of traffic control devices (Not Shown)
   I 2 Quadrant flashing warning devices-one track
   II 2 Quadrant flashing warning devices-multiple tracks
   III 2 Quadrant flashing warning devices and gates-one track
   IV 2 Quadrant flashing warning devices and gates-multiple tracks
   V 3-4 Quadrant flashing warning devices and gates-one track
   VI 2-4 Quadrant flashing warning devices and gates-multiple tracks

Note:
Two separate foundations may be required (one for signals, one for gate), depending on type of equipment used.

* When 10' is deemed impracticle the control device can be located as close as 2' from the edge of a paved shoulder but not less than 6' from the edge of the near traffic lane.



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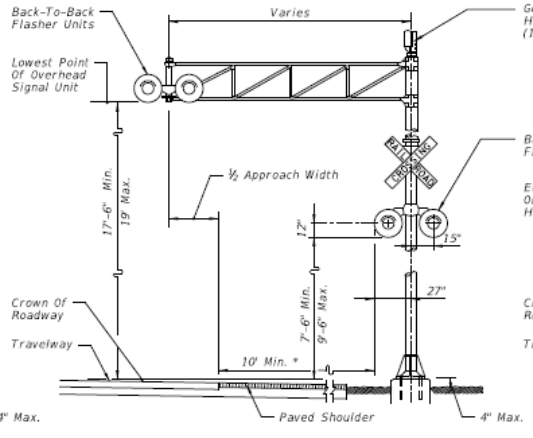
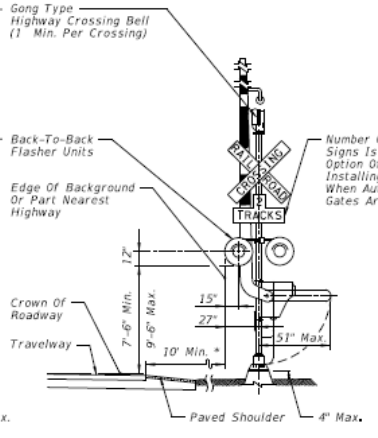
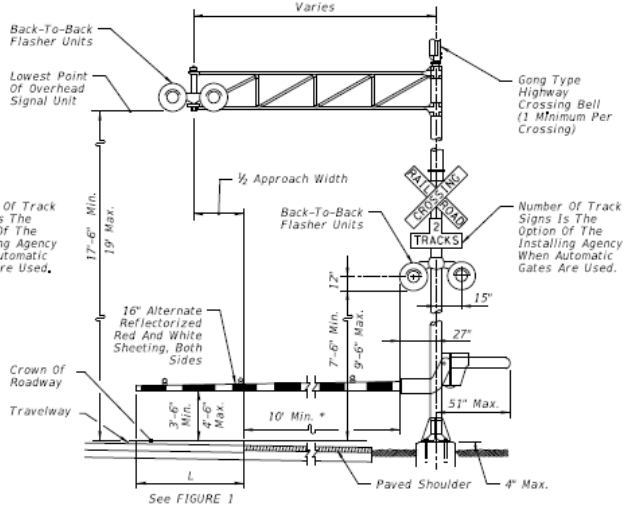


TYPE II



TYPE III AND TYPE V



TYPE IV AND TYPE VI

TRAFFIC CONTROL DEVICES FOR FLUSH SHOULDER ROADWAY

LAST REVISION	REVISION	DESCRIPTION:			INDEX NO.	SHEET NO.
11/07/16			FDOT FY 2017-18 DESIGN STANDARDS	RAILROAD GRADE CROSSING TRAFFIC CONTROL DEVICES	17882	1 of 4

11/9/2016 8:02:08 AM

Design Standards – Index Updates

15) ***Index 700*** - Roadside Offsets
- Index Deleted
- Plans Preparation Manual (PPM)

16) ***Index 11862*** - Roadside Flashing Beacon Assembly
- Reorganized Index for Clarity
- Included/Revised Callout/Dimensions As-needed

17) ***Index 17349*** - Traffic Controls for Street Terminations
- Revised Sign Placement for Consistency

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19) ***Index 17882*** - Railroad Grade Crossing Traffic Control Devices
- Added “Class” Differences to General Notes

Questions?

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FY 2017-18 Design Standards
Update Training

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Summary:

- **Index 400 – "Guardrail"**
  - Added notes referring to Index 402, 404, and 405 for Guardrail Connections to Existing Bridge Railings

- **Index 402 – "Guardrail Transitions & Connections for Existing Bridges"**
  - Added Previous Index 400 Guardrail Layout Drawings and Tables into Index 402, so that Index 402 is now self-sufficient for Guardrail Design

    NOTE: This is for a temporary interim period, until we can update this Index to use the new Length of Need process.

Background:

- **Index 400 – Guardrail**
  - **Recently Completed a Comprehensive Redevelopment Project for Entire Index**
    (Originally Released as a DSR on February 1st 2016)
    - New Index Sheets
    - New Specifications
    - New Instructions for Design Standards (IDS)
    - New Length of Need Design Process with FDOT Length of Need Design Tool (Excel)

Background:

- **See The 2016 Guardrail Training Webinar at…**
  http://www.fdot.gov/roadway/Training/TrainWeb.shtm

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Roadway Design

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Design Update Training

Thank you for visiting the Florida Department of Transportation Design Update Training Website. For your convenience, we have included links to the presentations from our Webinars and other training sessions. You will receive invaluable information regarding the recent updates to our Design standards, manuals, handbooks and other related issues. However, Professional Development Hour (PDH) Credits are not available for this training.

Clicking on the YEAR containing the desired subject matter, leads directly to the presentations and videos in our library.

Design Update Training Series

2017 (Link)

Plans Preparation Manual Updates for 2017 - New FDOT Design Manual (FDM)

2016 (Link)

Guardrail Training - Design Standards Index 400 - 4 training modules presented statewide

Federal Guidelines for Plain Language Initiatives

Plans Preparation Manual Updates for 2016

Background:

- **The 2016 Guardrail Training Explains the *New Length of Need Process…***
  - *Method for Designing the Required Guardrail Length for Shielding Hazards*
  - *Now uses the current **AASHTO Roadside Design Guide (RDG), 4th Edition***
  - *Now has a new Excel-based FDOT "Design Tool" for calculating the Length of Need and Guardrail Station callouts for common guardrail configurations…*

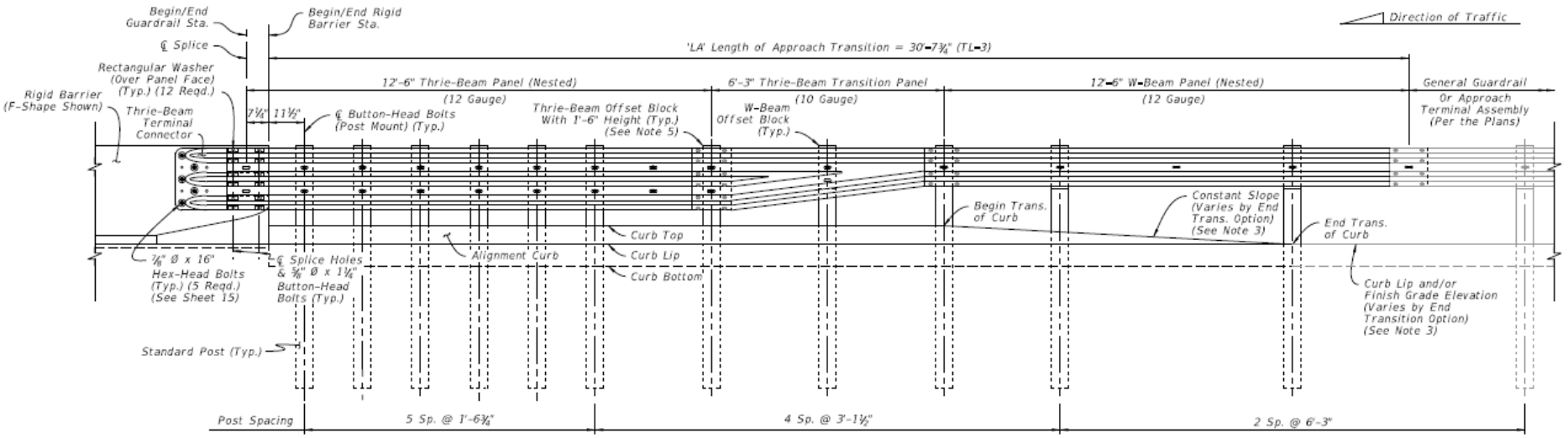
Index Number	Revised Sheets	Index Title	Design Information				
			Instructions (IDS)	Design Tools	Data Table Cell Library	Borderless DGNs	Associated Design Bulletin
	(PDF)		(PDF)	(Link)	(ZIP)	(ZIP) Terms of Use	(PDF)
400	1-22 of 22	Guardrail	IDS-00400	XLS	N/A	DGN	RDB16-01
410	2,10, 16-18 of 25	Concrete Barrier Wall	N/A	N		DGN	
411	6 of 10	Pier Protection Barrier	N/C	N		DGN	

Background:

- **The 2016 Guardrail Training Explains the**

  New Length of Need Process…

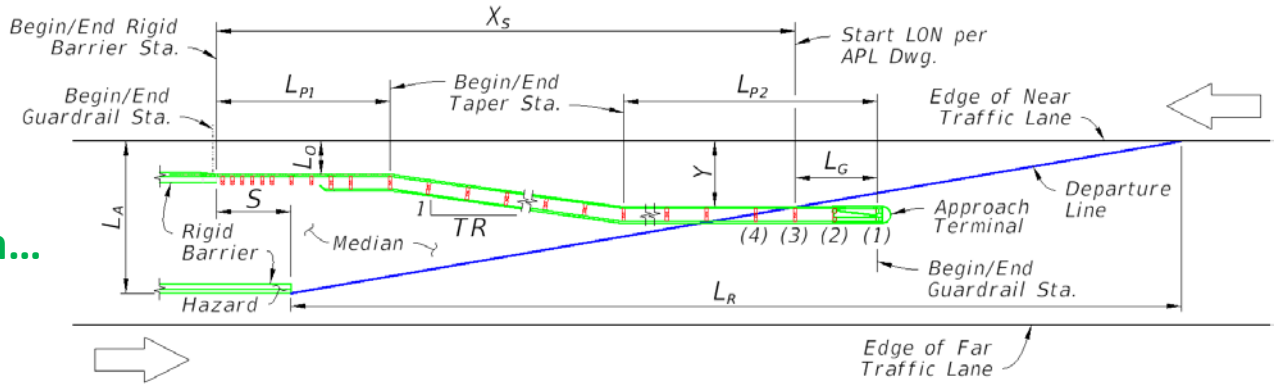
  - *ONLY WORKS WITH CONNECTING TO BRIDGES AS SHOWN IN **NEW INDEX 400! (Temporarily)***
  - *Generally only applies to new or non-conflicting circumstances (no bridge approach slab or other conflicting structure in the way of guardrail)*



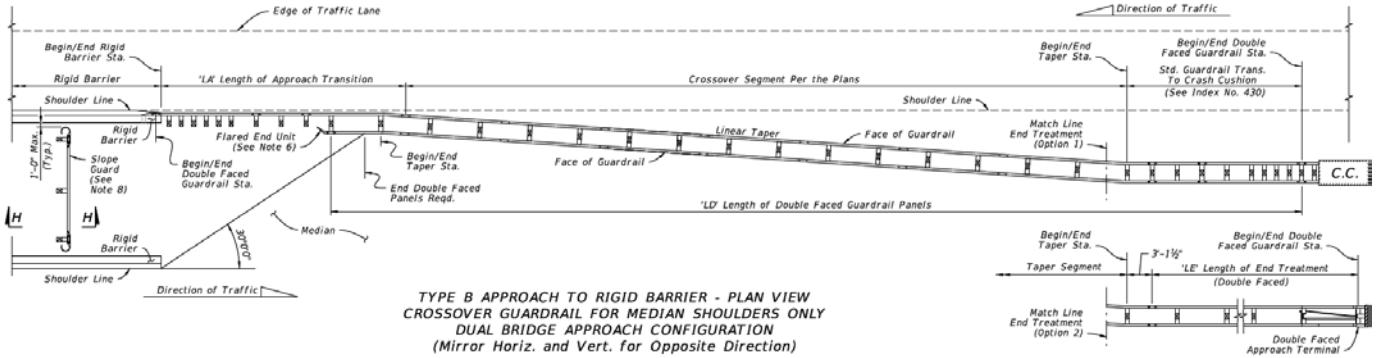
TL-3 APPROACH TRANSITION
INSTALLED ELEVATION

- ***New Length of Need Process…***
  - ***Index 400 guardrail connections to bridges are compatible.***
  - *Index 400 connections have required* ***standard length segments, parallel segments, and corresponding stationing callouts****.*

From LON Excel Program…



From Index 400…

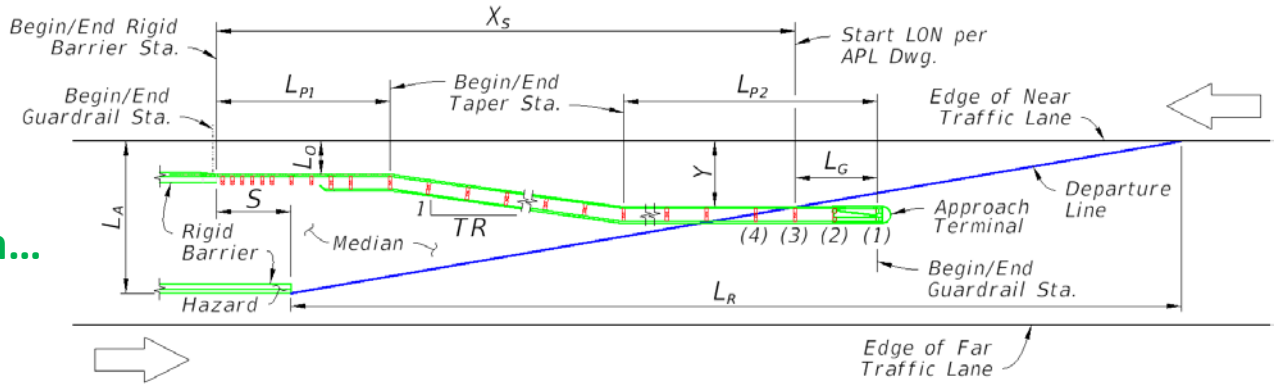


TYPE B APPROACH TO RIGID BARRIER - PLAN VIEW
CROSSOVER GUARDRAIL FOR MEDIAN SHOULDERS ONLY
DUAL BRIDGE APPROACH CONFIGURATION
(Mirror Horiz. and Vert. for Opposite Direction)

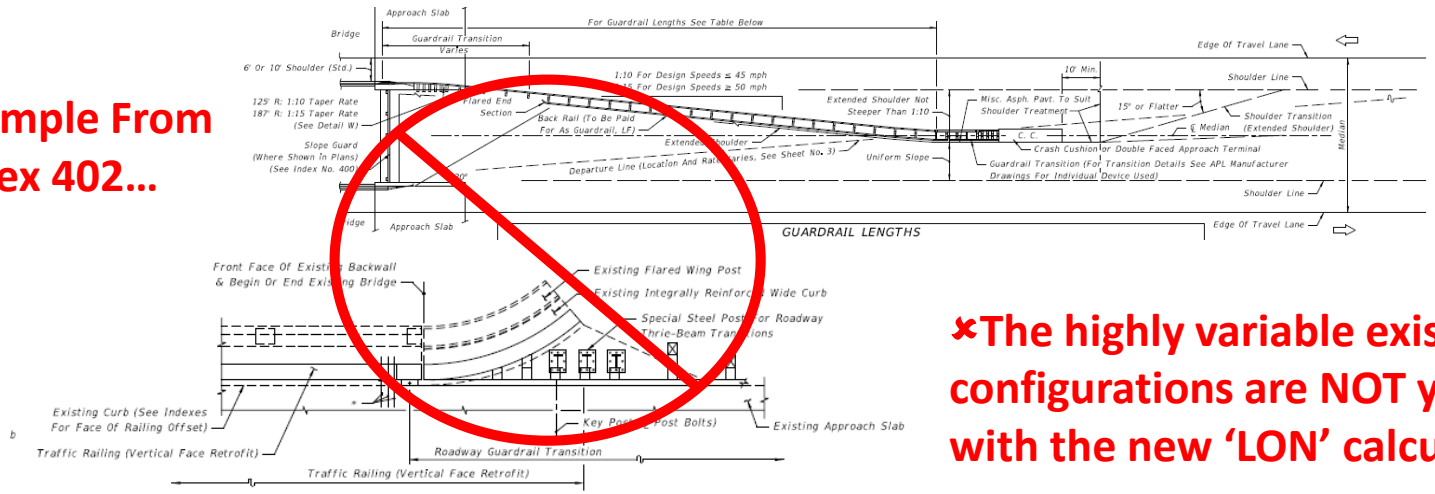
✓ **These are compatible!**

- ***New Length of Need Process…***
  - ***WHAT'S NOT COMPATIBLE?! (TEMPORARILY)***
  - *Index 402 Guardrail Connections to existing bridges are not yet compatible with the new Length of Need process… There are very many existing combinations.*

From LON Excel Program…

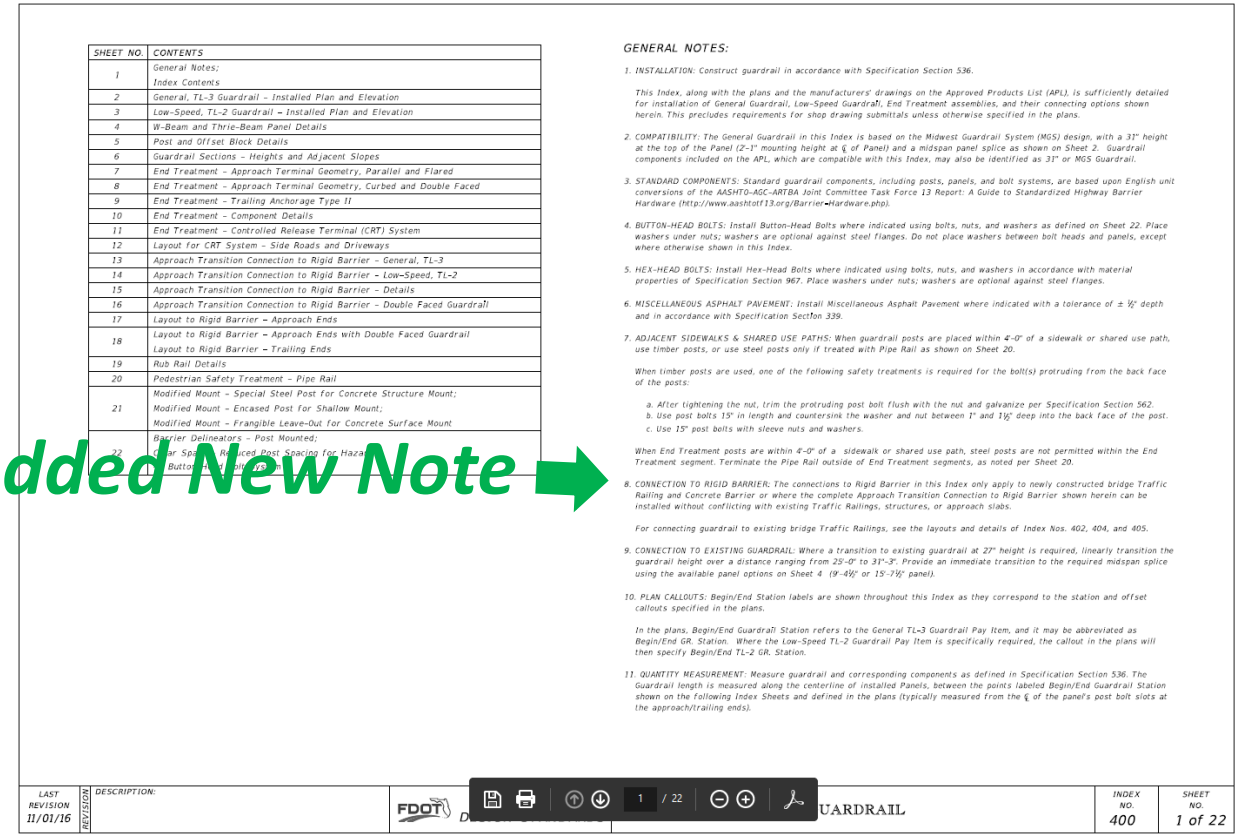


Example From Index 402…



✖The highly variable existing bridge configurations are NOT yet compatible with the new 'LON' calculation

Index 400 Revision:



SHEET NO.	CONTENTS
1	General Notes; Index Contents
2	General, TL-3 Guardrail – Installed Plan and Elevation
3	Low-Speed, TL-2 Guardrail – Installed Plan and Elevation
4	W-Beam and Thrie-Beam Panel Details
5	Post and Offset Block Details
6	Guardrail Sections – Heights and Adjacent Slopes
7	End Treatment – Approach Terminal Geometry, Parallel and Flared
8	End Treatment – Approach Terminal Geometry, Curbed and Double Faced
9	End Treatment – Trailing Anchorage Type II
10	End Treatment – Component Details
11	End Treatment – Controlled Release Terminal (CRT) System
12	Layout for CRT System – Side Roads and Driveways
13	Approach Transition Connection to Rigid Barrier – General, TL-3
14	Approach Transition Connection to Rigid Barrier – Low-Speed, TL-2
15	Approach Transition Connection to Rigid Barrier – Details
16	Approach Transition Connection to Rigid Barrier – Double Faced Guardrail
17	Layout to Rigid Barrier – Approach Ends
18	Layout to Rigid Barrier – Approach Ends with Double Faced Guardrail Layout to Rigid Barrier – Trailing Ends
19	Rub Rail Details
20	Pedestrian Safety Treatment – Pipe Rail
21	Modified Mount – Special Steel Post for Concrete Structure Mount; Modified Mount – Encased Post for Shallow Mount; Modified Mount – Frangible Leave-Out for Concrete Surface Mount
22	Barrier Delineators – Post Mounted; Cable Spacing – Reduced Post Spacing for Hazardous Locations; Button Head Bolts

Added New Note

GENERAL NOTES:

1. INSTALLATION: Construct guardrail in accordance with Specification Section 536.

   This Index, along with the plans and the manufacturers' drawings on the Approved Products List (APL), is sufficiently detailed for installation of General Guardrail, Low-Speed Guardrail, End Treatment assemblies, and their connecting options shown herein. This precludes requirements for shop drawing submittals unless otherwise specified in the plans.

2. COMPATIBILITY: The General Guardrail in this Index is based on the Midwest Guardrail System (MGS) design, with a 31" height at the top of the Panel (2'-1" mounting height at ℄ of Panel) and a midspan panel splice as shown on Sheet 2. Guardrail components included on the APL, which are compatible with this Index, may also be identified as 31" or MGS Guardrail.

3. STANDARD COMPONENTS: Standard guardrail components, including posts, panels, and bolt systems, are based upon English unit conversions of the AASHTO-AGC-ARTBA Joint Committee Task Force 13 Report: A Guide to Standardized Highway Barrier Hardware (http://www.aashtotf13.org/Barrier-Hardware.php).

4. BUTTON-HEAD BOLTS: Install Button-Head Bolts where indicated using bolts, nuts, and washers as defined on Sheet 22. Place washers under nuts; washers are optional against steel flanges. Do not place washers between bolt heads and panels, except where otherwise shown in this Index.

5. HEX-HEAD BOLTS: Install Hex-Head Bolts where indicated using bolts, nuts, and washers in accordance with material properties of Specification Section 967. Place washers under nuts; washers are optional against steel flanges.

6. MISCELLANEOUS ASPHALT PAVEMENT: Install Miscellaneous Asphalt Pavement where indicated with a tolerance of ± ½" depth and in accordance with Specification Section 339.

7. ADJACENT SIDEWALKS & SHARED USE PATHS: When guardrail posts are placed within 4'-0" of a sidewalk or shared use path, use timber posts, or use steel posts only if treated with Pipe Rail as shown on Sheet 20.

   When timber posts are used, one of the following safety treatments is required for the bolt(s) protruding from the back face of the posts:

   a. After tightening the nut, trim the protruding post bolt flush with the nut and galvanize per Specification Section 562.
   b. Use post bolts 15" in length and countersink the washer and nut between 1" and 1½" deep into the back face of the post.
   c. Use 15" post bolts with sleeve nuts and washers.

   When End Treatment posts are within 4'-0" of a sidewalk or shared use path, steel posts are not permitted within the End Treatment segment. Terminate the Pipe Rail outside of End Treatment segments, as noted per Sheet 20.

8. CONNECTION TO RIGID BARRIER: The connections to Rigid Barrier in this Index only apply to newly constructed bridge Traffic Railing and Concrete Barrier or where the complete Approach Transition Connection to Rigid Barrier shown herein can be installed without conflicting with existing Traffic Railings, structures, or approach slabs.

   For connecting guardrail to existing bridge Traffic Railings, see the layouts and details of Index Nos. 402, 404, and 405.

9. CONNECTION TO EXISTING GUARDRAIL: Where a transition to existing guardrail at 27" height is required, linearly transition the guardrail height over a distance ranging from 25'-0" to 31'-3". Provide an immediate transition to the required midspan splice using the available panel options on Sheet 4 (9'-4½" or 15'-7½" panel).

10. PLAN CALLOUTS: Begin/End Station labels are shown throughout this Index as they correspond to the station and offset callouts specified in the plans.

    In the plans, Begin/End Guardrail Station refers to the General TL-3 Guardrail Pay Item, and it may be abbreviated as Begin/End GR. Station. Where the Low-Speed TL-2 Guardrail Pay Item is specifically required, the callout in the plans will then specify Begin/End TL-2 GR. Station.

11. QUANTITY MEASUREMENT: Measure guardrail and corresponding components as defined in Specification Section 536. The Guardrail length is measured along the centerline of installed Panels, between the points labeled Begin/End Guardrail Station shown on the following Index Sheets and defined in the plans (typically measured from the ℄ of the panel's post bolt slots at the approach/trailing ends).

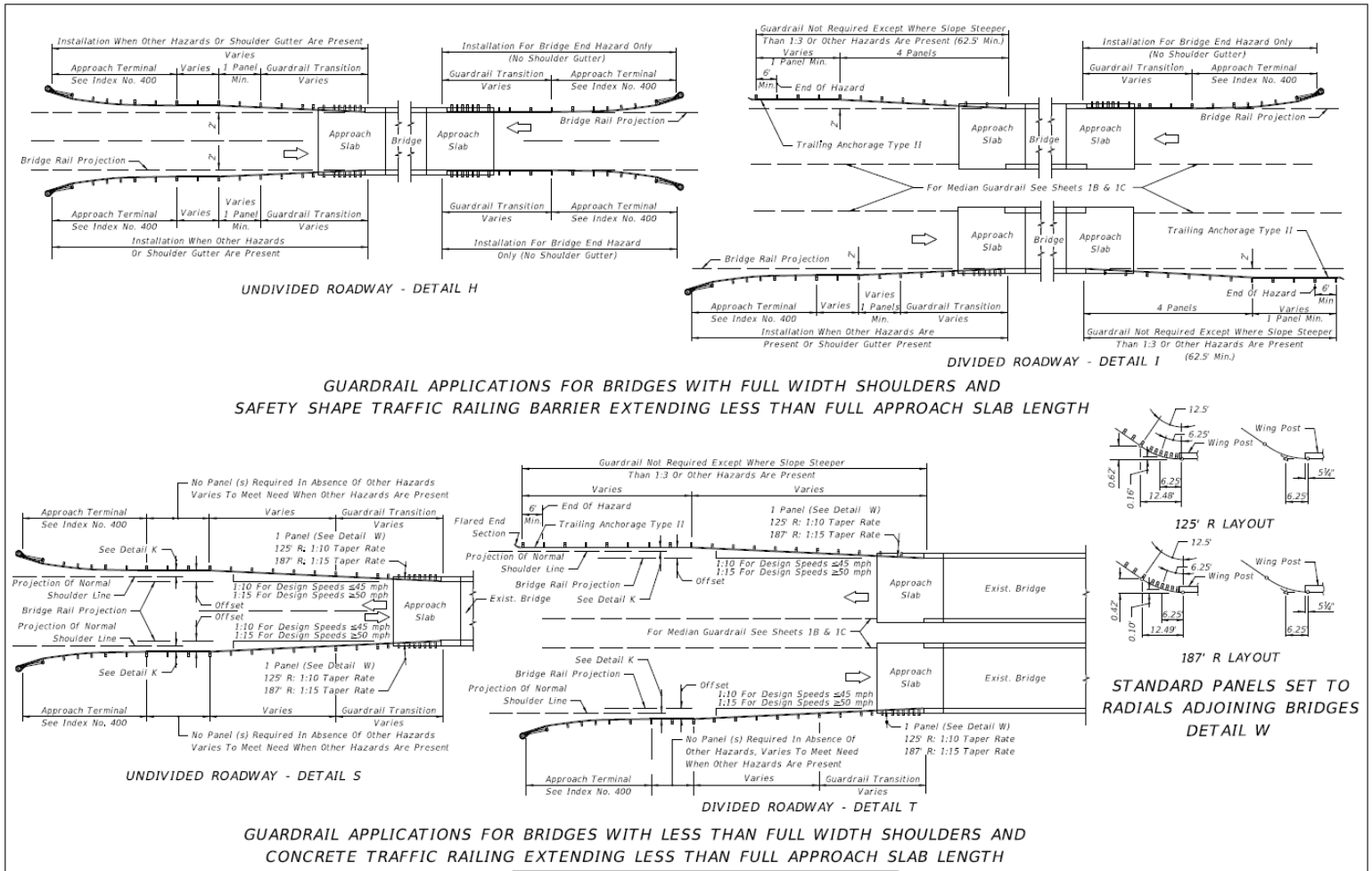
LAST REVISION	REVISION	DESCRIPTION:		INDEX NO.	SHEET NO.
11/01/16			UARDRAIL	400	1 of 22

8. CONNECTION TO RIGID BARRIER: The connections to Rigid Barrier in this Index only apply to newly constructed bridge Traffic Railing and Concrete Barrier or where the complete Approach Transition Connection to Rigid Barrier shown herein can be installed without conflicting with existing Traffic Railings, structures, or approach slabs.

For connecting guardrail to existing bridge Traffic Railings, see the layouts and details of Index Nos. 402, 404, and 405.

Index 402 Revision: *Added New Sheets*

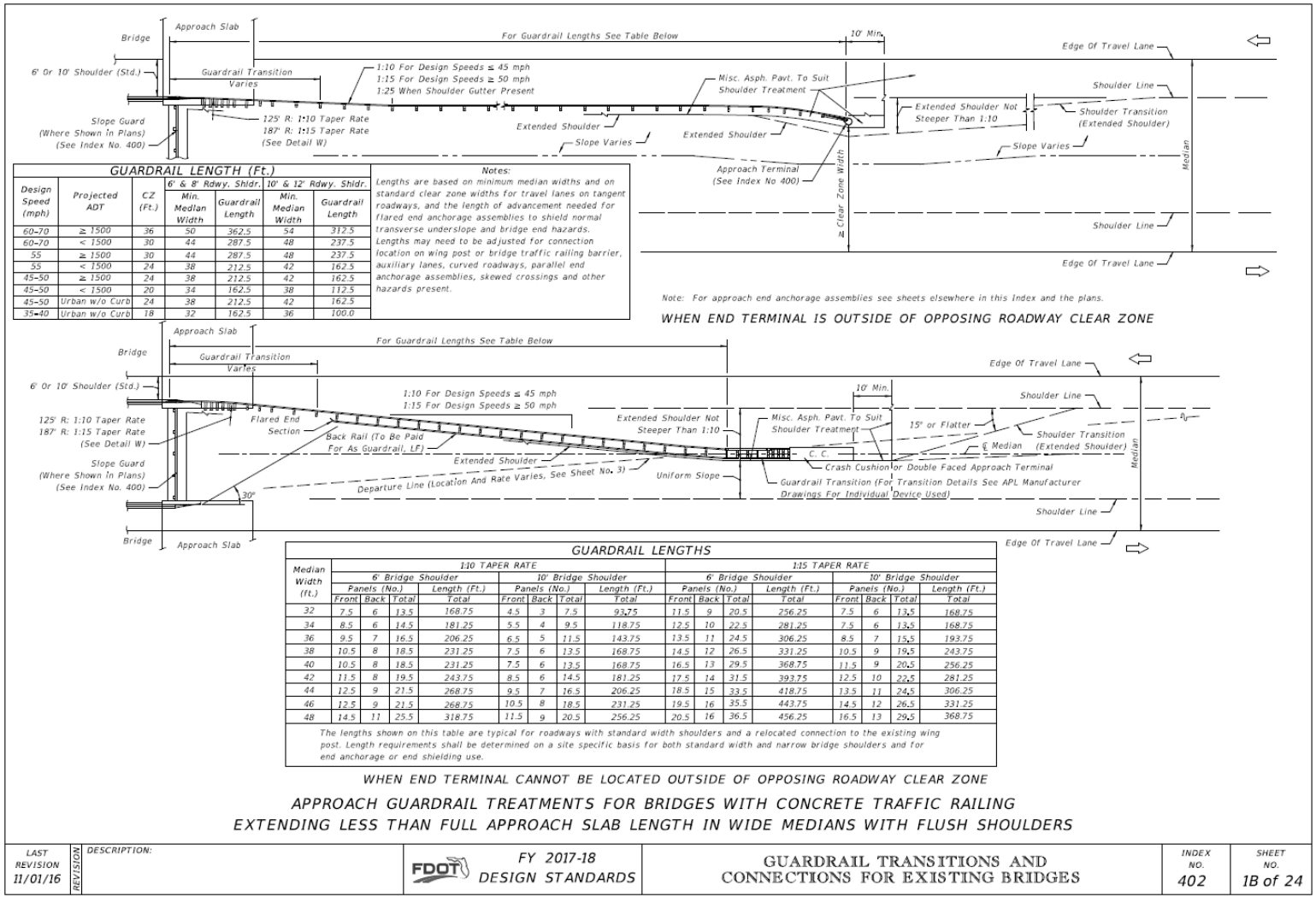
New Sheet 1A: *(From "Old" 2016-17 Design Standards eBook, Index 400)*



- Shows overall plan view layouts for existing Bridges
- Guardrail Curves away to avoid approach slabs (Unlike new bridge Index 400 layout)

Index 402 Revision: *Added New Sheets*

New Sheet 1B: *(From "Old" 2016-17 Design Standards eBook, Index 400)*



GUARDRAIL LENGTH (Ft.)

Design Speed (mph)	Projected ADT	CZ (Ft.)	6' & 8' Rdwy. Shldr. Min. Median Width	6' & 8' Rdwy. Shldr. Guardrail Length	10' & 12' Rdwy. Shldr. Min. Median Width	10' & 12' Rdwy. Shldr. Guardrail Length
60-70	≥ 1500	36	50	362.5	54	312.5
60-70	< 1500	30	44	287.5	48	237.5
55	≥ 1500	30	44	287.5	48	237.5
55	< 1500	24	38	212.5	42	162.5
45-50	≥ 1500	24	38	212.5	42	162.5
45-50	< 1500	20	34	162.5	38	112.5
45-50	Urban w/o Curb	24	38	212.5	42	162.5
35-40	Urban w/o Curb	18	32	162.5	36	100.0

Notes:
Lengths are based on minimum median widths and on standard clear zone widths for travel lanes on tangent roadways, and the length of advancement needed for flared end anchorage assemblies to shield normal transverse underslope and bridge end hazards. Lengths may need to be adjusted for connection location on wing post or bridge traffic railing barrier, auxiliary lanes, curved roadways, parallel end anchorage assemblies, skewed crossings and other hazards present.

GUARDRAIL LENGTHS

Median Width (ft.)	1:10 TAPER RATE 6' Bridge Shoulder Panels (No.) Front	Back	Total	Length (Ft.) Total	1:10 TAPER RATE 10' Bridge Shoulder Panels (No.) Front	Back	Total	Length (Ft.) Total	1:15 TAPER RATE 6' Bridge Shoulder Panels (No.) Front	Back	Total	Length (Ft.) Total	1:15 TAPER RATE 10' Bridge Shoulder Panels (No.) Front	Back	Total	Length (Ft.) Total
32	7.5	6	13.5	168.75	4.5	3	7.5	93.75	11.5	9	20.5	256.25	7.5	6	13.5	168.75
34	8.5	6	14.5	181.25	5.5	4	9.5	118.75	12.5	10	22.5	281.25	7.5	6	13.5	168.75
36	9.5	7	16.5	206.25	6.5	5	11.5	143.75	13.5	11	24.5	306.25	8.5	7	15.5	193.75
38	10.5	8	18.5	231.25	7.5	6	13.5	168.75	14.5	12	26.5	331.25	10.5	9	19.5	243.75
40	10.5	8	18.5	231.25	7.5	6	13.5	168.75	16.5	13	29.5	368.75	11.5	9	20.5	256.25
42	11.5	8	19.5	243.75	8.5	6	14.5	181.25	17.5	14	31.5	393.75	12.5	10	22.5	281.25
44	12.5	9	21.5	268.75	9.5	7	16.5	206.25	18.5	15	33.5	418.75	13.5	11	24.5	306.25
46	12.5	9	21.5	268.75	10.5	8	18.5	231.25	19.5	16	35.5	443.75	14.5	12	26.5	331.25
48	14.5	11	25.5	318.75	11.5	9	20.5	256.25	20.5	16	36.5	456.25	16.5	13	29.5	368.75

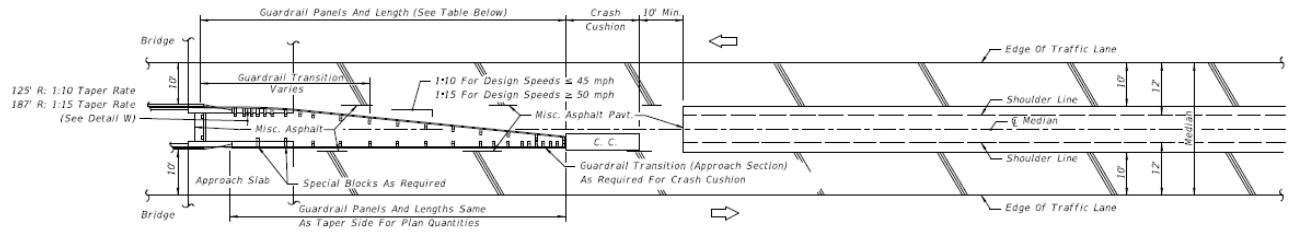
The lengths shown on this table are typical for roadways with standard width shoulders and a relocated connection to the existing wing post. Length requirements shall be determined on a site specific basis for both standard width and narrow bridge shoulders and for end anchorage or end shielding use.

LAST REVISION	REVISION DESCRIPTION:	FDOT	FY 2017-18 DESIGN STANDARDS	GUARDRAIL TRANSITIONS AND CONNECTIONS FOR EXISTING BRIDGES	INDEX NO.	SHEET NO.
11/01/16					402	1B of 24

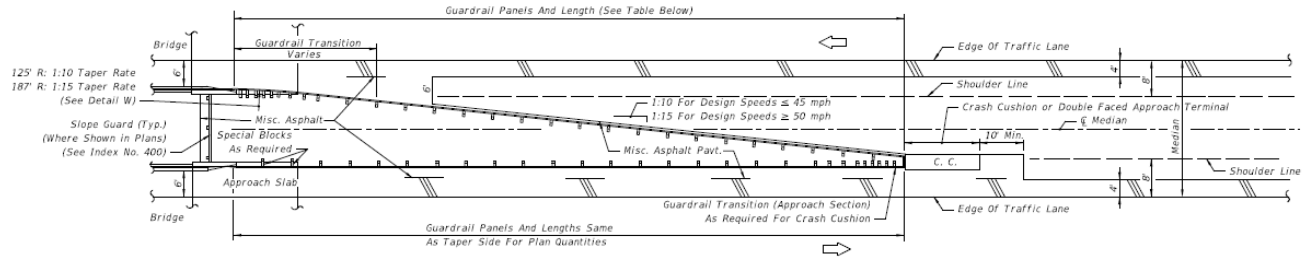
- Provides Guardrail Length Table for Existing Bridge Layout
- Used as a guide to check existing guardrail, which may be replaced "in kind" if it's the same or longer than this table shows

Index 402 Revision: *Added New Sheets*

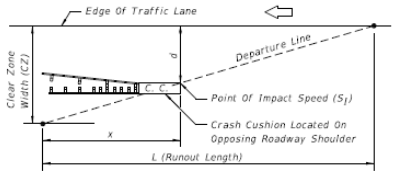
New Sheet 1C: *(From "Old" 2016-17 Design Standards eBook, Index 400)*



MEDIANS WITH 10' BRIDGE SHOULDERS



MEDIANS WITH 6' BRIDGE SHOULDERS



Speed (S_I) For Determining Crash Cushion Size:

$S_I = \frac{x}{L}$ (Design Speed) $= \left[\frac{(CZ - d)}{CZ}\right]$ Design Speed

SIZING CRASH CUSHIONS LOCATED ON OPPOSING ROADWAY SHOULDERS

Note: The guardrail configurations shown apply only to parallel or near parallel bridges with open medians.

GUARDRAIL LENGTHS

MEDIAN WIDTH (Ft.)	6' BRIDGE SHOULDERS				10' BRIDGE SHOULDERS			
	1:10 TAPER RATE		1:15 TAPER RATE		1:10 TAPER RATE		1:15 TAPER RATE	
	PANELS (No.)	LENGTH (Ft.)	PANELS (No.)	LENGTH (Ft.)	PANELS (No.)	LENGTH (Ft.)	PANELS (No.)	LENGTH (Ft.)
30	12.5	156.25	18.5	231.25	6.5	81.25	9.5	118.75
28	11.5	143.75	16.5	206.25	5.5	68.75	7.5	93.75
26	9.5	118.75	14.5	181.25	5.5*	68.75	5.5*	68.75
24	8.5	106.25	11.5	143.75	5.5*	68.75	5.5*	68.75

The lengths shown in this table are based on standard widths for roadway and bridge median shoulders. Length requirements for both standard width and narrow bridge shoulders and end anchorage or end shielding requirements shall be determined on a site specific basis. When crash cushions are required on opposing roadway shoulders, their sizes may be determined by the residual speeds (S_I's) along the runouts from the approach roadways; however, when calculated speeds (S_I's) are less than 30 mph crash cushions shall be no less in size than for 30 mph; see speed diagram left. The number of panels may be reduced when installing a crash cushion more than 2.5' in width; see * below.

*Number shown is the minimum number of panels plus a W-Thrie beam transition panel; single faced guardrail must have a length of five (5) or more panels.

APPROACH GUARDRAIL TREATMENTS FOR BRIDGES WITH CONCRETE TRAFFIC RAILING EXTENDING LESS THAN FULL APPROACH SLAB LENGTH IN NARROW MEDIANS WITH FLUSH SHOULDERS

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2017-18 DESIGN STANDARDS	GUARDRAIL TRANSITIONS AND CONNECTIONS FOR EXISTING BRIDGES	INDEX NO.	SHEET NO.
11/01/16						402	1C of 24

- Provides Guardrail Length Table for Existing Bridge Layout
- Used as a guide to check existing guardrail, which may be replaced "in kind" if it's the same or longer than this table shows

Summary:

Long Term, it's our goal to use the new Length of Need Excel tool for all bridge connections, both new and existing configurations (likely 2019-20 eBook).

In the interim, the following applies:

- For guardrail designs which connect to ***new*** or non-conflicting bridge configurations, use Index 400 and the new 'Length of Need' Excel Tool.

- For guardrail designs which connect to ***existing*** bridge configurations that conflict with Index 400 details, use Index 402 and it's included length table method.

The above is explained in the new Index 400 Instructions for Design Standards (IDS)!

Please consult the IDS for specific design information on guardrail, listed by topic.

The comprehensive guardrail webinar training is also available for further assistance.

Questions?

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Landscape and Tree Protection

542- Tree Protection and Preservation
544- Landscape Installation

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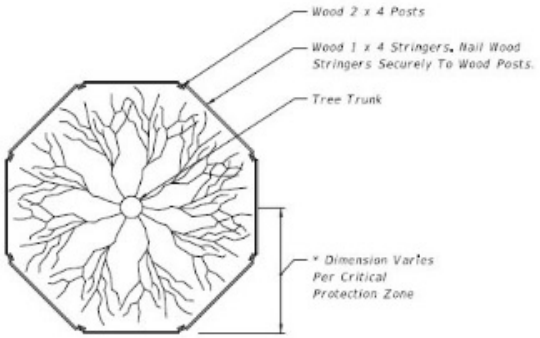
Index 544- Landscape Installation

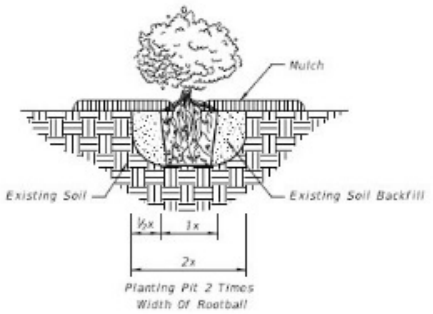
Changes:

- From 3 pages to 2
- Move tree protection information to New Index 542, 'Tree Protection and Preservation'
- Eliminate shrub planting details

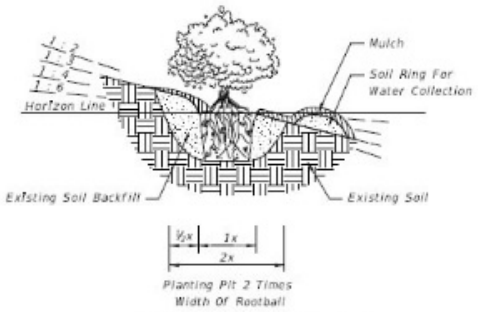
Design Standards – Index 544



NOTE: For Groups Of Trees, Place Barricades Between Trees And Construction Activity.

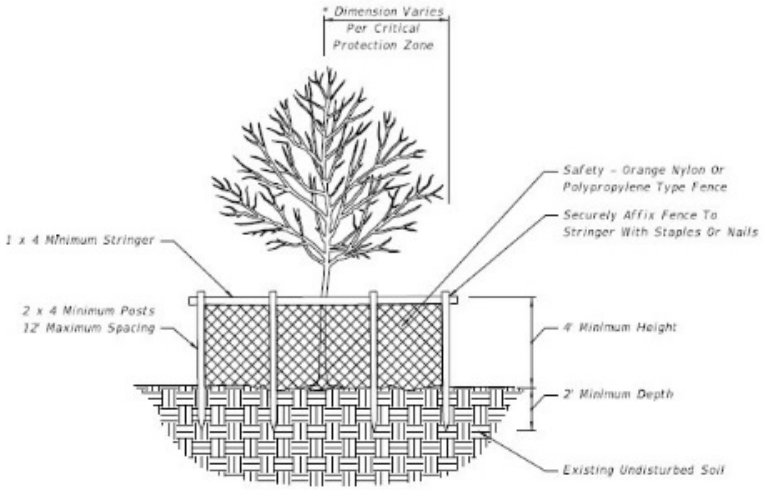


GROUND COVER/SHRUB PLANTING



NOTE: Slope Provided As Rise:Run.

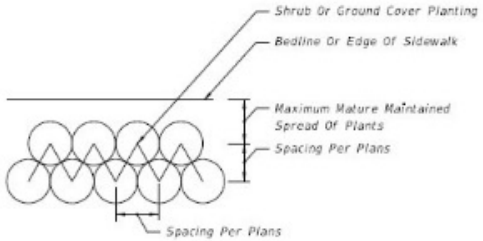
GROUND COVER/SHRUB PLANTING ON SLOPE



NOTES: Critical Protection Zone: The Area Surrounding A Tree Within A Circle Described By A Radius Of One Foot For Each Inch Of The Tree Trunk Diameter At 54" Above Finished Grade. For Groups Of Trees, Place Barricades Between Trees And Construction Activity.

* Tree Protection Barricades Shall Be Located To Protect A Minimum Of 75% Of The Critical Protection Zone.

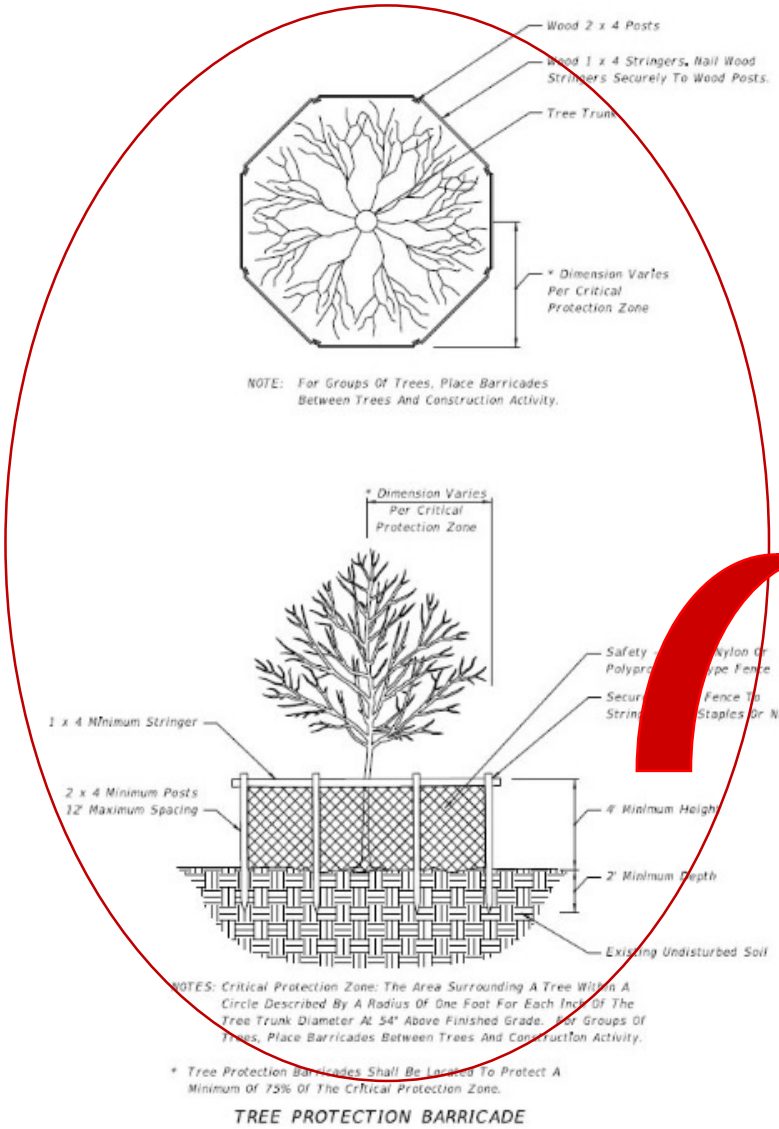
TREE PROTECTION BARRICADE



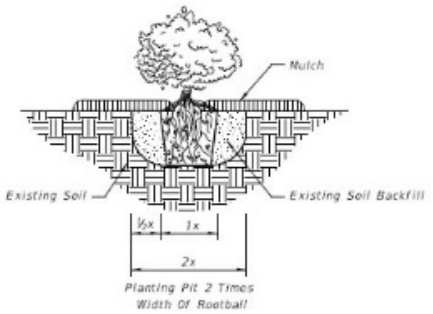
GROUND COVER/SHRUB LAYOUT DETAIL

LAST REVISION 07/01/07	REVISION	DESCRIPTION:	FDOT FY 2016-17 DESIGN STANDARDS	LANDSCAPE INSTALLATION	INDEX NO. 544	SHEET NO. 3 of 3

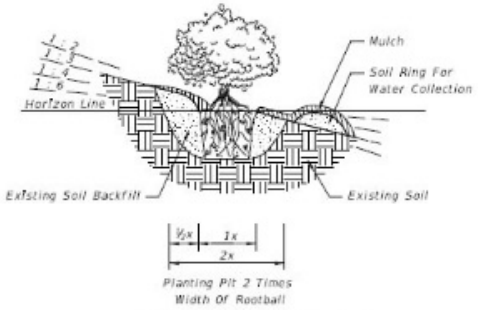
Design Standards – Index 544



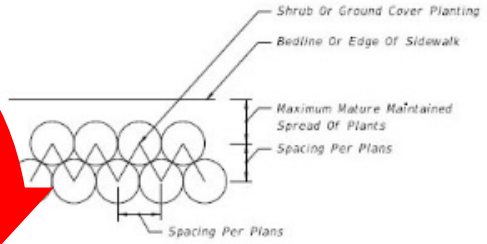
TREE PROTECTION BARRICADE



GROUND COVER/SHRUB PLANTING



GROUND COVER/SHRUB PLANTING ON SLOPE

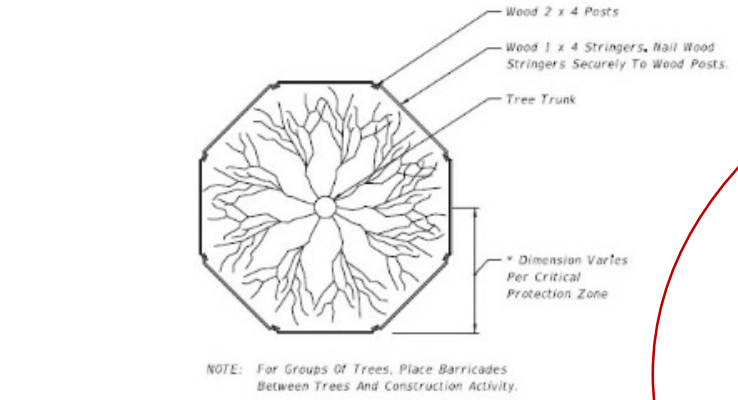


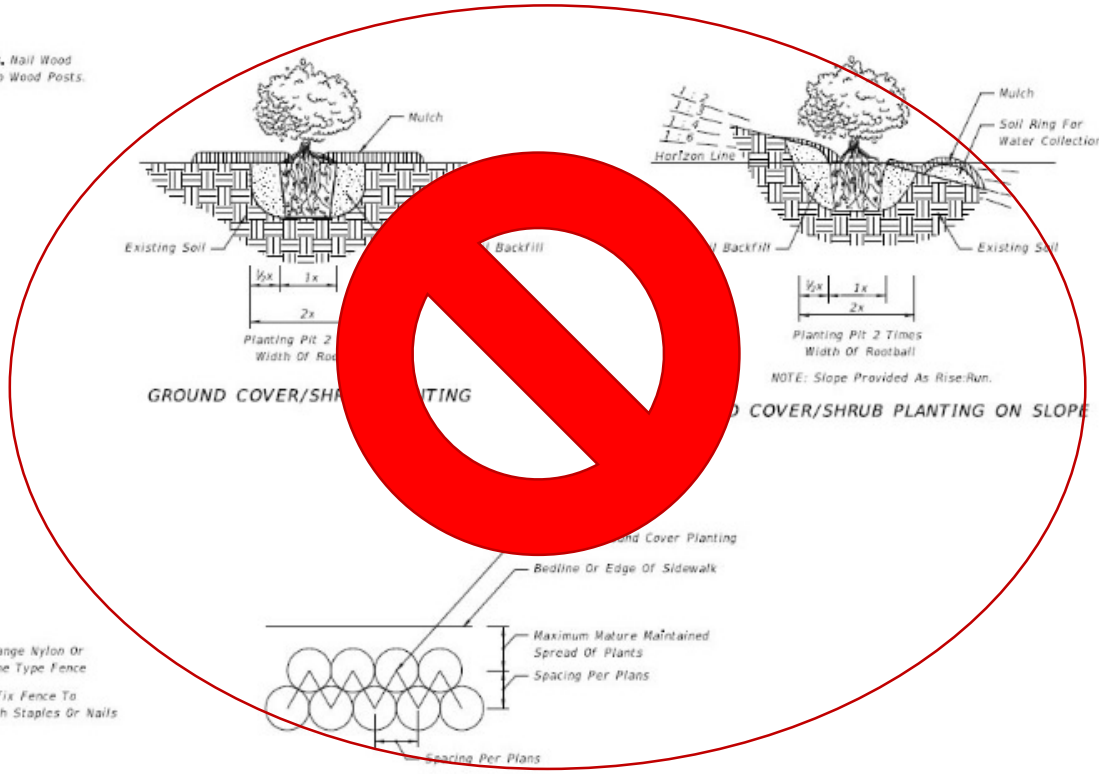
GROUND COVER/SHRUB LAYOUT DETAIL

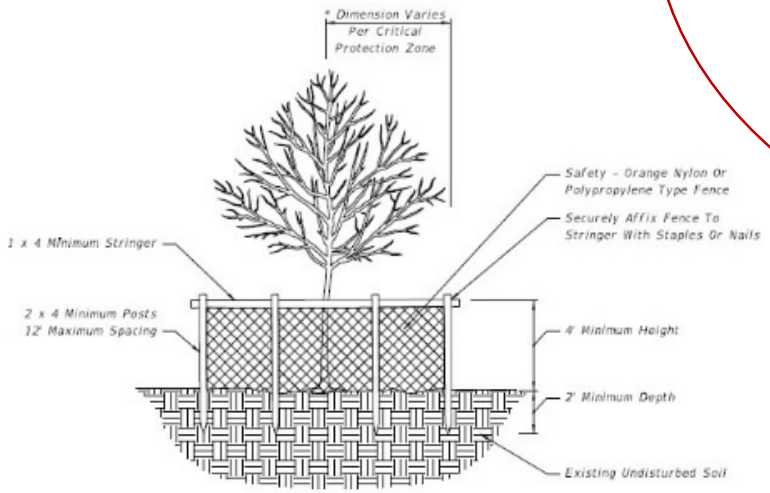
Tree protection is expanded and moved to the new Index No. 542 'Tree Protection and Preservation'

LAST REVISION 07/01/07	REVISION	DESCRIPTION:	FDOT FY 2016-17 DESIGN STANDARDS	LANDSCAPE INSTALLATION	INDEX NO. 544	SHEET NO. 3 of 3

Design Standards – Index 544







Shrub planting details are eliminated

LAST REVISION 07/01/07	REVISION	DESCRIPTION:	FDOT FY 2016-17 DESIGN STANDARDS	LANDSCAPE INSTALLATION	INDEX NO. 544	SHEET NO. 3 of 3

Index 542- Tree Protection and Preservation

New index addresses:

- Tree Protection barrier
- Identification of Crown Dripline Protection Zone
- Layout of protection barriers for tree massings
- Trunk Protection

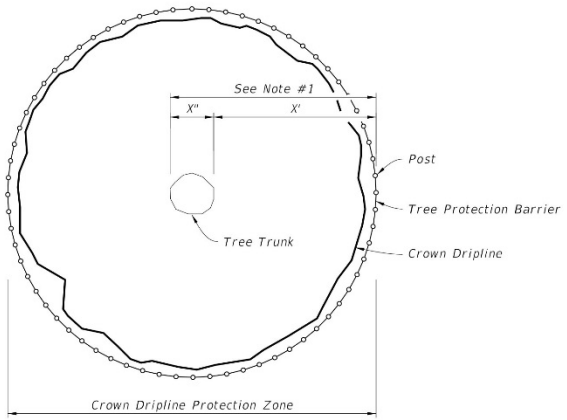
Index 542- Tree Protection and Preservation

New index addresses:

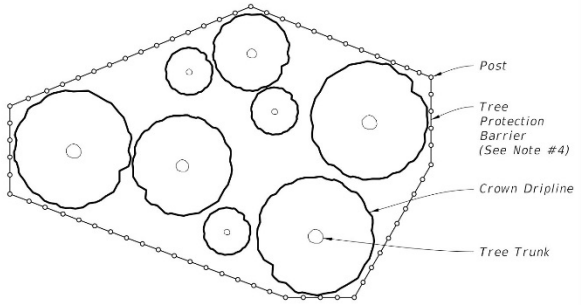
- Tree Protection barrier
  - Mature tree
  - signage
- Identification of Crown Dripline Protection Zone
  - (1’ per 1” of trunk at DBH)
  - Ex.: 9” DBH tree will have tree protection fencing located at least 9’ distance from trunk
- Layout of protection barriers for tree massings
  - Common sense
- Trunk Protection
  - Only used when Tree Protection Barrier can not be reasonably erected.

NOTES:

1. Crown Dripline Protection Zone: Extends in all directions from trunk of tree to a distance equal to one foot per inch of trunk diameter at breast height.
2. Staging, storage, dumping, washing and operation of equipment is not permitted within the limits of the tree protection barrier, including during barrier installation.
3. Install all tree protection prior to commencement of construction and remove when directed by the engineer. Maintain protection at all times.
4. For closely spaced groups of trees, place the tree protection barrier around the entire group.
5. Inspect trunk protection and tree quarterly to prevent girdling. Adjust bands to allow tree growth as needed.
6. See plans for any additional requirements or modifications within the tree protection area.
7. Place weather resistant sign every 50' along the barrier, with 6" minimum text height and provide text in English and Spanish. Sign should read " Keep Out Tree Protection Area".
8. Alternate tree protection systems approved by the Engineer may be used in lieu of the tree pretection barrier detailed on this Index.

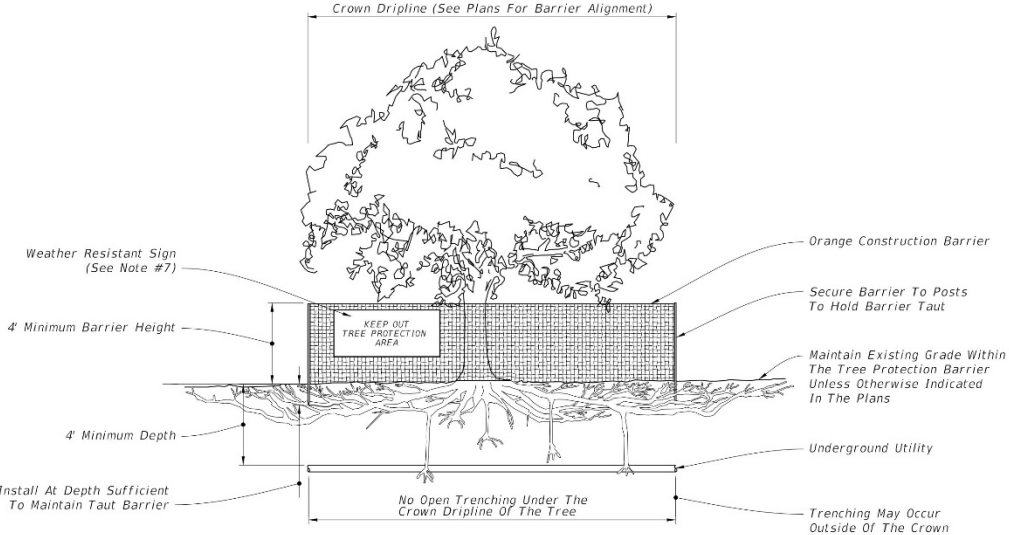


PLAN



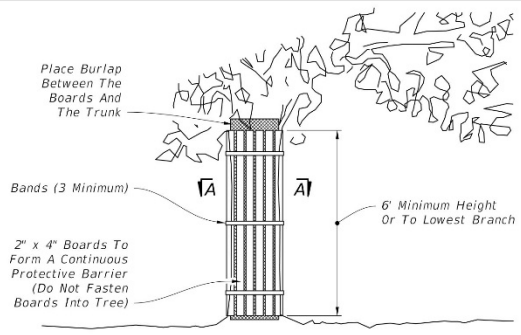
PLAN

PROTECTION BARRIER FOR TREE GROUPINGS

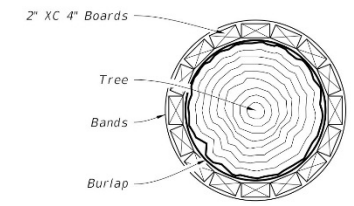


ELEVATION

TREE PROTECTION BARRIER



ELEVATION



SECTION A-A

NOTES:

1. Install trunk protection when Tree Protection Barrier can not be reasonably erected.
2. See Selective Clearing and Grubbing Plan for location of trunk protection.
3. Adjust bands to allow tree growth (inspect quarterly to prevent girdling).

TRUNK PROTECTION

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2017-18 DESIGN STANDARDS	TREE PROTECTION AND PRESERVATION	INDEX NO.	SHEET NO.
11/01/16						542	1 of 1

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Design Standards – Spec. 110

“Goes with”:

-Standard Specification 110, Clearing and Grubbing (July ‘17)

Pay Item **110- 2- 2 Selective Clearing and Grubbing, Areas with Trees to Remain, Acre,** is to be used when vegetation is to remain and there is selective vegetation removal. Identify areas to Selectively Clear and Grub on the Selective Clearing and Grubbing plan sheet and identify the trees to remain. Also show the location of required tree protection barriers and branch pruning or root pruning.

Pay Item **110- 2- 3 Selective Clearing and Grubbing, Plant Preservation Area, Acre,** is to be used when Plant Preservation Areas are to be established.
Designate protected areas, along with tree protection barrier on the Selective Clearing and Grubbing plan sheet. No construction activity
is to be performed in these designated areas.

Questions?

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FY 2017-18 Design Standards Update Training

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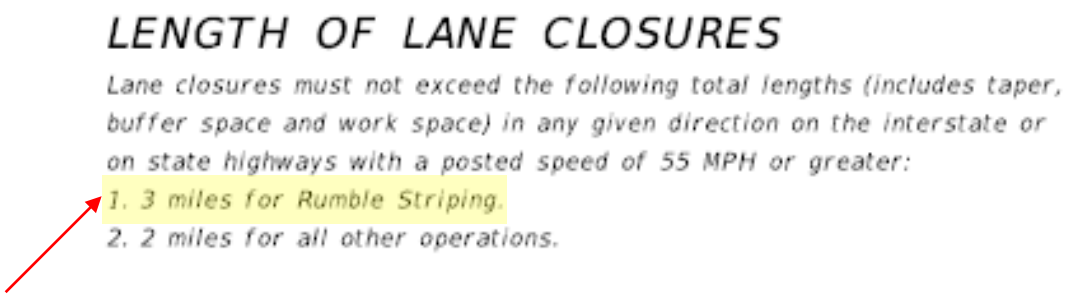
Index 600
"General Information for Traffic Control Through Work Zones"
Sheet 3 of 12

- Revised lane closure length to address Rumble Striping and productivity concerns



LENGTH OF LANE CLOSURES

Lane closures must not exceed the following total lengths (includes taper, buffer space and work space) in any given direction on the interstate or on state highways with a posted speed of 55 MPH or greater:

1. 3 miles for Rumble Striping.

2. 2 miles for all other operations.

Index 600
"General Information for Traffic Control Through Work Zones"
Sheet 5 of 12

- Clarified intent of requirements in the Temporary Sign Support Note

TEMPORARY SIGN SUPPORT NOTE:

1. Unless shielded with barrier or outside of the Clear Zone, signs mounted on temporary supports or barricades, and barricade/sign combination must be crashworthy in accordance with NCHRP 350 requirements and included on the Approved Products List (APL).

Design Standards Update Training

Index 606
"Two-Lane, Two-Way, Work Within the Travel Way – Signal Control"
Sheet 1 of 4

- Removed Signal Mount Detail. Revised "distance between signals" requirement.

2. The installation and timing of signals shall be approved by the District Traffic Operations Engineer prior to signals being placed in operation.

Where sight distance to the signal is limited, the temporary traffic signals may be relocated at the discretion of the Engineer. Timing adjustments must be made by the Worksite Traffic Supervisor based on changing field conditions. Changes to timing (either reoccurring or lasting more than 24 hours) must be approved by the District Traffic Operation Engineer.

Whether the signals are in automatic mode or being controlled manually, in no case will the distance between the portable signals (receiver/controllers) exceed the maximum distance at which the portable signals can be positively and safely operated in accordance with manufacturer's recommendations. When distances between signals exceed 0.25 miles, a combination of a pilot vehicle with manually controlled temporary traffic signals are required.

Barricades shall be in place to block haul road access when the haul road is not in operation and a flagger/signal operator is not on duty, except when the haul road is an existing properly marked road.

7. When a side road intersects the highway within the TTC zone, additional TTC devices shall be placed in accordance with other applicable TCZ Indexes.

8. For general TCZ requirements and additional information, refer to Index No. 600.

9. Temporary traffic signals are to be used only in work zones with workers present, where the contractor can monitor signal operation and maintain traffic with flaggers in the event of a power failure.

10. Use Temporary Raised Rumble Strips in accordance with Index 603.

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES WILL ENCROACH ON ONE LANE OR MOMENTARILY ENCROACH ON BOTH LANES OF A TWO-LANE TWO-WAY ROADWAY AND TRAFFIC SIGNALS ARE NEEDED.

Pavement Or Bridge D

Clear Zone

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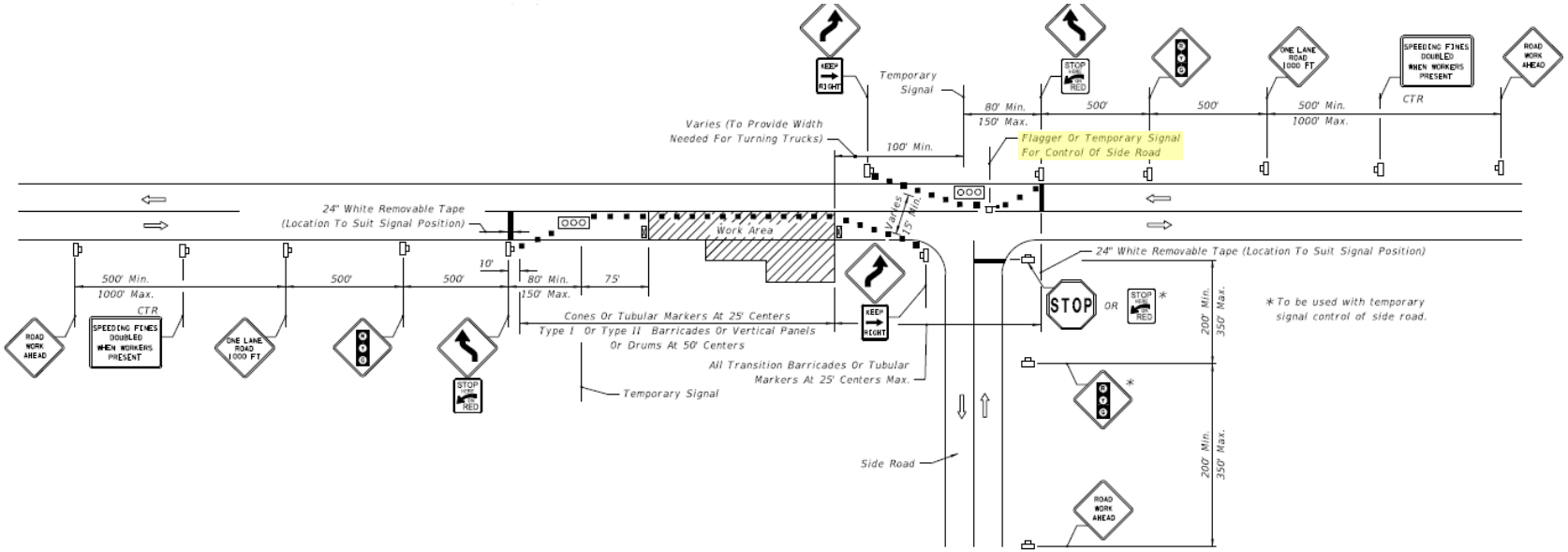
LAST REVISION 11/01/16	REVISION	DESCRIPTION:	FDOT FY 2017-18 DESIGN STANDARDS	TWO-LANE, TWO-WAY, WORK WITHIN THE TRAVEL WAY - SIGNAL CONTROL	INDEX NO. 606	SHEET NO. 1 of 4

Index 606
"Two-Lane, Two-Way, Work Within the Travel Way – Signal Control"
General Comment

- For side roads and haul roads, temporary signal control is now an option

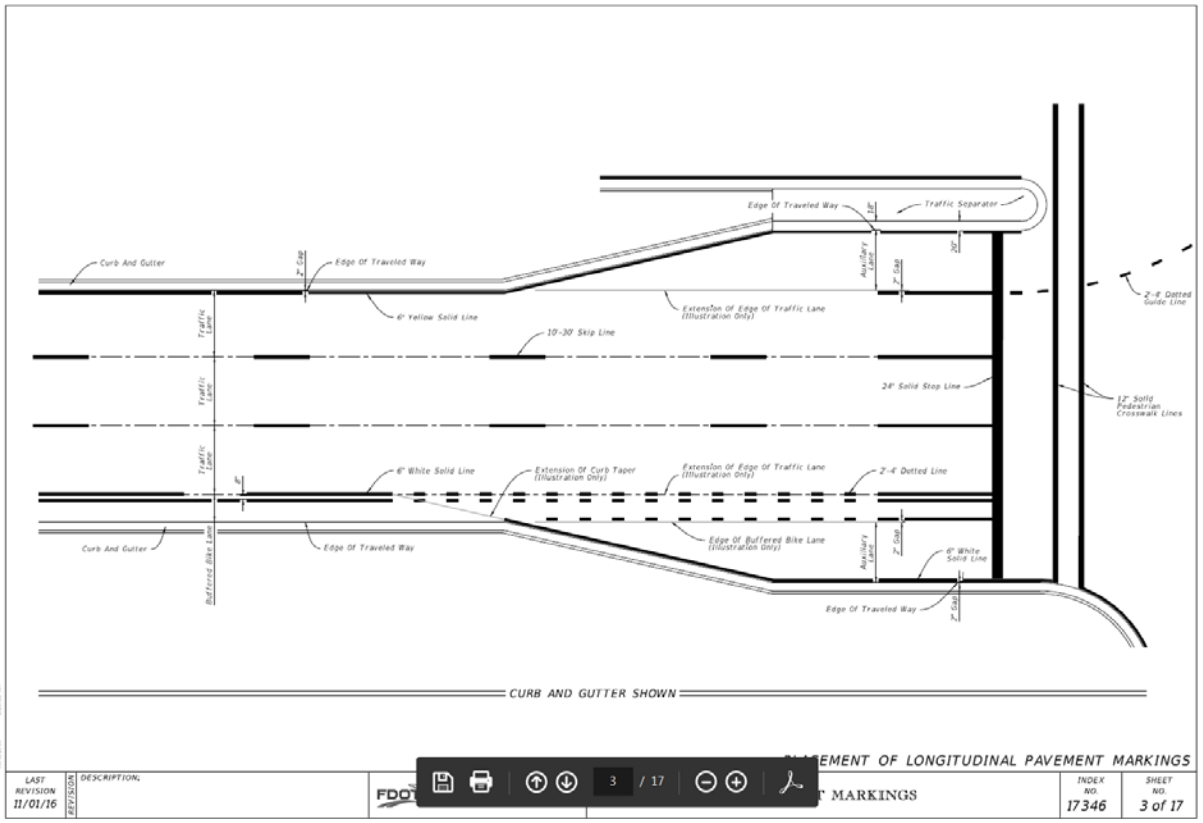


Index 660
"Pedestrian Control for Closure of Sidewalks"
Sheet 1 of 1

- For pedestrian longitudinal channelizing devices, work zone signs can be mounted or standalone

Index 17346
"Pavement Markings"

- Changed Index name from "Special Marking Areas" to "Pavement Markings"
- Added two new sheets to more clearly show longitudinal pavement markings.



Questions

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