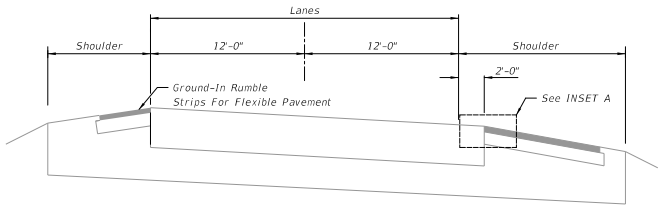
2016 Design Standards
Traffic Standards

Roadway Design Office Updates

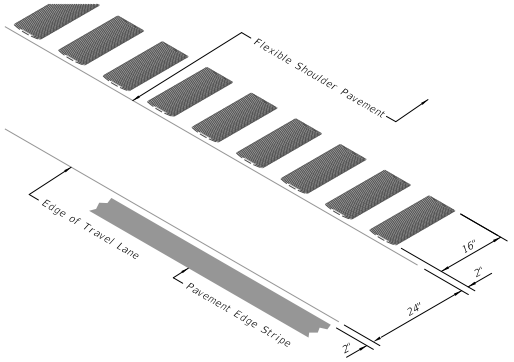
Chester Hensen, P.E.
Roadway Design Standards Group
chester.hensen@dot.state.fl.us
(850) 414-4117

Index 518

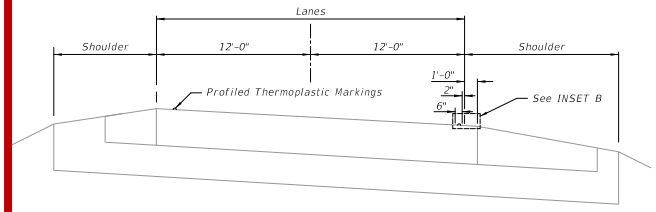


NTS

RIGID PAVEMENT WITH FLEXIBLE PAVEMENT SHOULDER

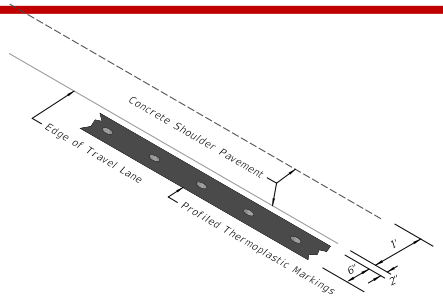


ISOMETRIC - LONGITUDINAL CUT
INSET A



NTS

RIGID PAVEMENT WITH RIGID PAVEMENT SHOULDER



ISOMETRIC - LONGITUDINAL CUT (RIGID PAVEMENT)
INSET B

7/23/2015 1:51:17 PM

LAST REVISION 07/01/15	REVISION	DESCRIPTION:	FDOT 2017 DESIGN STANDARDS	SHOULDER RUMBLE STRIPS	INDEX NO. 518	SHEET NO. 2 of 2

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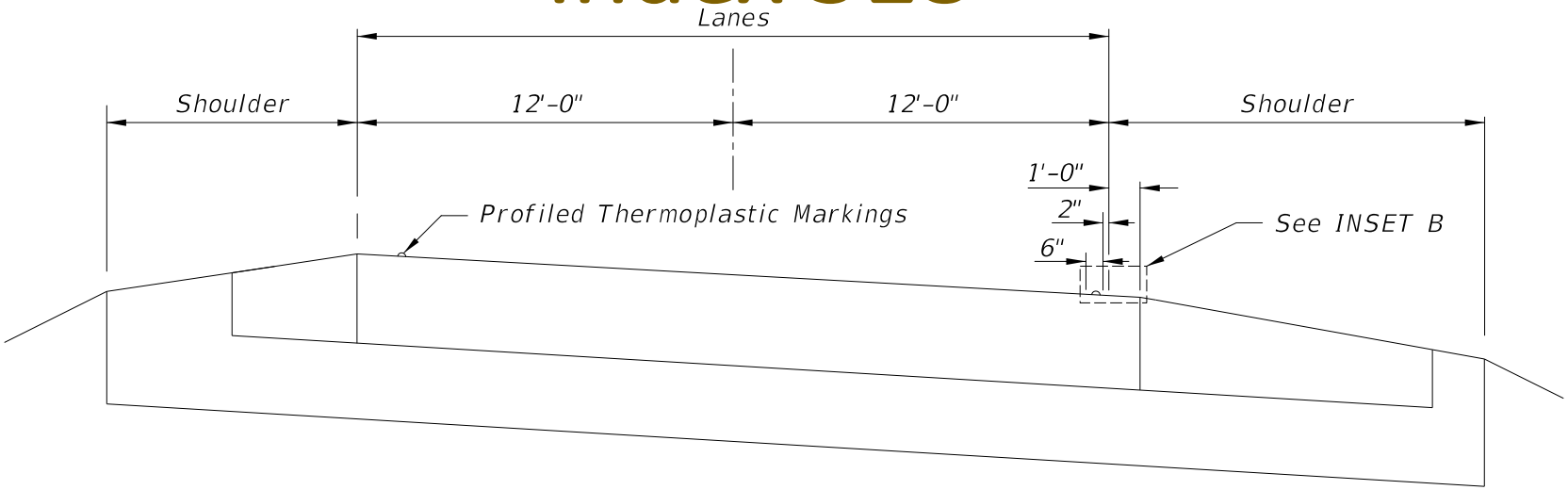

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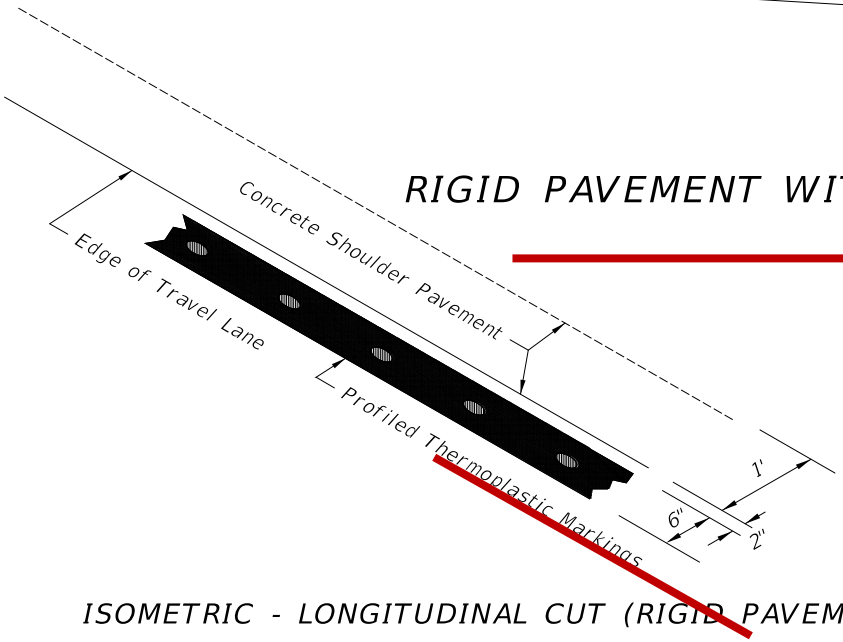
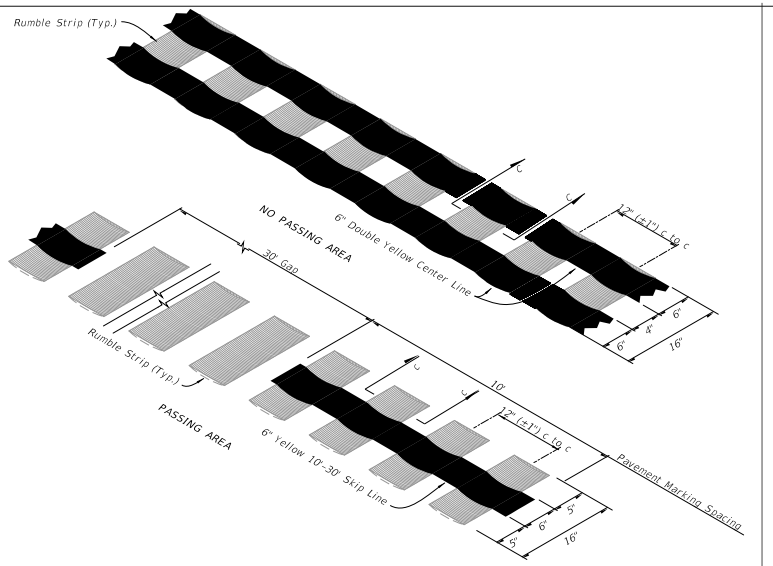
RIGID PAVEMENT WITH RIGID PAVEMENT SHOULDER

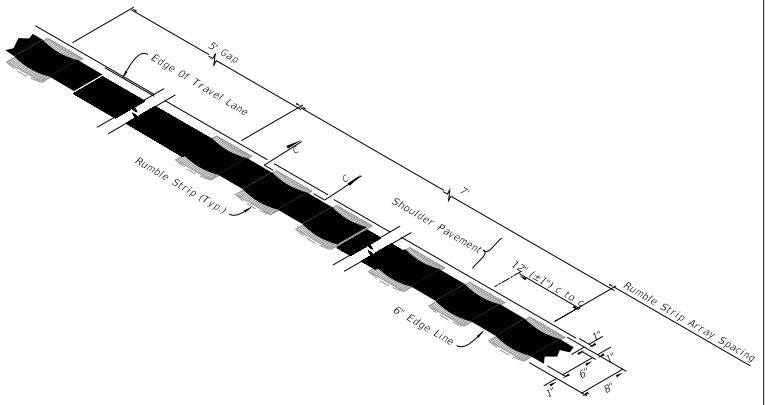


ISOMETRIC - LONGITUDINAL CUT (RIGID PAVEMENT)
INSET B

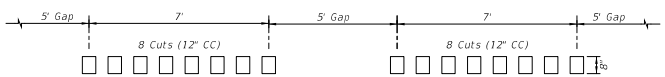
Index 519 in RDB 15-03



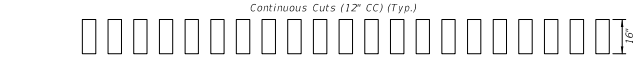
CENTER LINE RUMBLE STRIPING
ISOMETRIC - LONGITUDINAL CUT



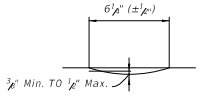
EDGE LINE RUMBLE STRIPING
ISOMETRIC - LONGITUDINAL CUT



SKIP ARRAY RUMBLE STRIP
(For All Edge Lines)



CONTINUOUS ARRAY RUMBLE STRIP
(For All Center Lines)



SECTION C-C
RUMBLE STRIP DEPTH

GENERAL NOTES:

1. Rumble Striping consists of a ground-in rumble strip with a pavement marking applied over the strip. Construct ground-in rumble strips centered on the proposed center line or edge line markings in accordance with Specification Section 546.
2. The rumble strip depth detailed on this sheet is for use on dense-graded flexible pavement only.
3. Use the Skip Array Rumble Strip for edge line rumble striping and use the Continuous Array Rumble Strip for center line rumble striping.
4. Remove raised retroreflective pavement markers when in conflict with the installation of center line rumble strip grinding operations. The cost of removal is included in the cost of the rumble strip.
5. Replacement of retroreflective pavement markers which were removed during the installation of center line rumble strip grinding operations will be paid for under Pay Item 706.
6. An extra application of paint is required within 24 hours of each day's grinding operation. Payment for the extra application of paint is not included in 710-90 and will be paid for under the appropriate 710 pay item structure.
7. The quantity of center line and edge line ground-in rumble strips will be the length in net miles constructed and accepted. No deduction will be made when the skip array is used.

2/3/2015 10:32:36 AM

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Index 519 in RDB 15-03

GENERAL NOTES:

1. *Rumble Striping consists of a ground-in rumble strip with a pavement marking applied over the strip. Construct ground-in rumble strips centered on the proposed center line or edge line markings in accordance with Specification Section 546.*

2. *The rumble strip depth detailed on this sheet is for use on dense-graded flexible pavement only.*

3. *Use the Skip Array Rumble Strip for edge line rumble striping and use the Continuous Array Rumble Strip for center line rumble striping.*

4. *Remove raised retroreflective pavement markers when in conflict with the installation of center line rumble strip grinding operations. The cost of removal is included in the cost of the rumble strip.*

5. *Replacement of retroreflective pavement markers which were removed during the installation of center line rumble strip grinding operations will be paid for under Pay Item 706.*

6. *An extra application of paint is required within 24 hours of each day's grinding operation. Payment for the extra application of paint is not included in 710-90 and will be paid for under the appropriate 710 pay item structure.*

7. *The quantity of center line and edge line ground-in rumble strips will be the length in net miles constructed and accepted. No deduction will be made when the skip array is used.*

Jan. 2016 - Specification Section 710-4.1.1

710-4.1.1 Painted Pavement Marking (Final Surface):

When permanent pavement markings are placed on newly constructed asphalt with rumble striping,

- apply two applications of standard paint,
- one application of Class D retroreflective pavement markers, if applicable,
- and one application of Class B retroreflective pavement markers.
- For center line rumble striping installations, install Class D retroreflective pavement markers, remove them prior to grinding, and install Class B retroreflective pavement markers on the non-ground surface after grinding.

Jan. 2016 - Specification Section 710-4.1.1

710-4.1.1 Painted Pavement Marking (Final Surface):

When permanent pavement markings are placed on newly constructed asphalt with rumble striping,

- apply two applications of standard paint,
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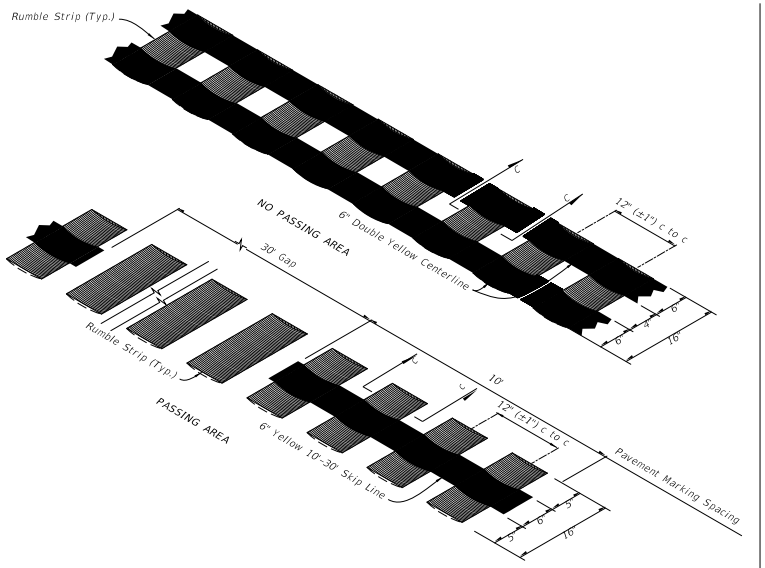
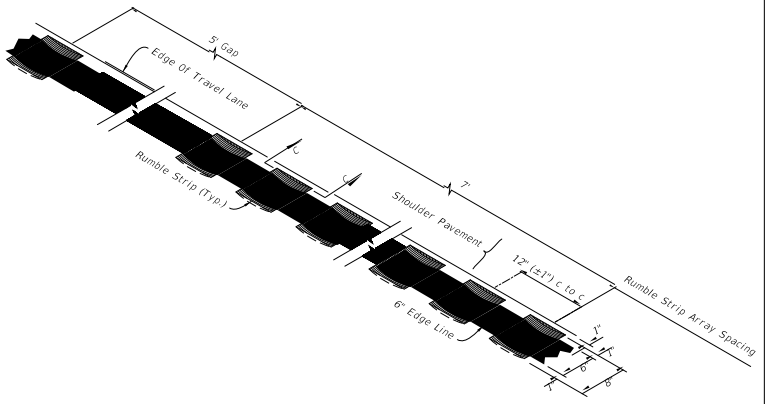
- and one application of Class B retroreflective pavement markers.
- For center line rumble striping installations, install Class D retroreflective pavement markers, remove them prior to grinding, and install Class B retroreflective pavement markers on the non-ground surface after grinding.

Class D RPM's

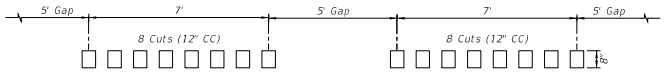
Index 519 in 2016 DSeB



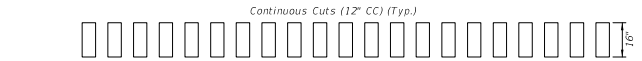
CENTER LINE RUMBLE STRIPING
ISOMETRIC - LONGITUDINAL CUT



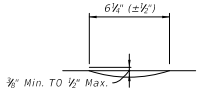
EDGE LINE RUMBLE STRIPING
ISOMETRIC - LONGITUDINAL CUT



SKIP ARRAY RUMBLE STRIP
(For All Edge Lines)



CONTINUOUS ARRAY RUMBLE STRIP
(For All Centerlines)



SECTION C-C
RUMBLE STRIP DEPTH

GENERAL NOTES:

1. Construct ground-in rumble strips centered on the proposed centerline or edge line markings in accordance with Specification Section 546.
2. The rumble strip depth detailed on this sheet is for use on dense-graded flexible pavement only.
3. Use the Skip Array Rumble Strip for edge line rumble striping and use the Continuous Array Rumble Strip for center line rumble striping.

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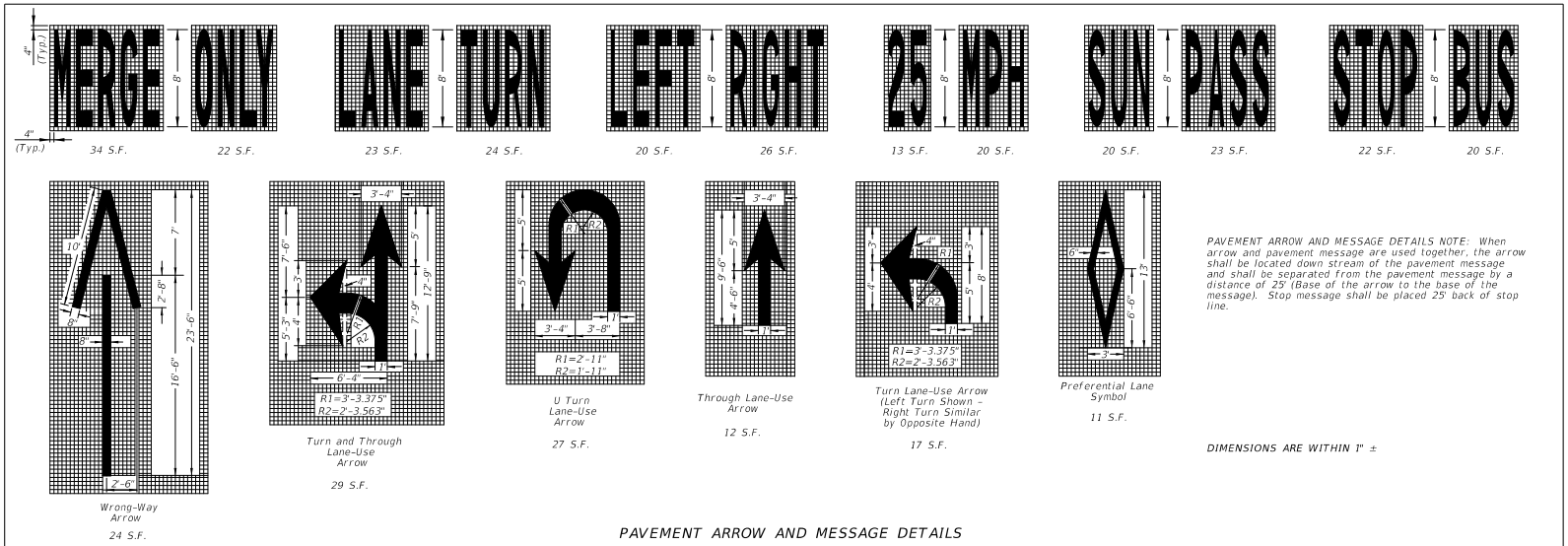
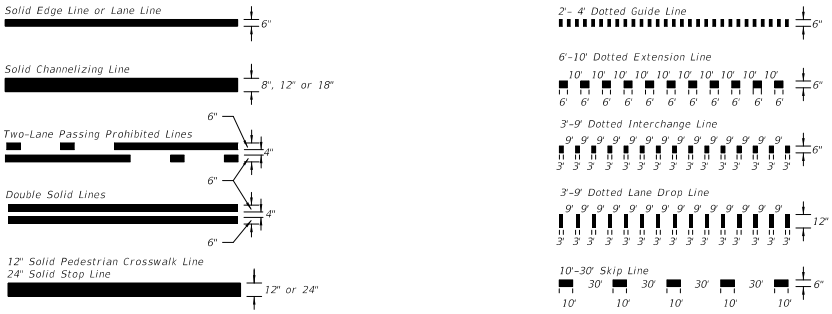


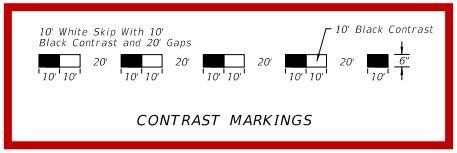
PAVEMENT ARROW AND MESSAGE DETAILS NOTE: When arrow and pavement message are used together, the arrow shall be located down stream of the pavement message and shall be separated from the pavement message by a distance of 25' (Base of the arrow to the base of the message). Stop message shall be placed 25' back of stop line.

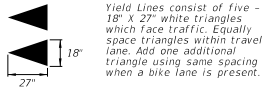
DIMENSIONS ARE WITHIN 1" ±

PAVEMENT ARROW AND MESSAGE DETAILS



TYPES OF PAVEMENT MARKING LINES





Yield Lines consist of five - 18" X 27" white triangles which face traffic. Equally space triangles within travel lane. Add one additional triangle using same spacing when a bike lane is present.

YIELD LINES

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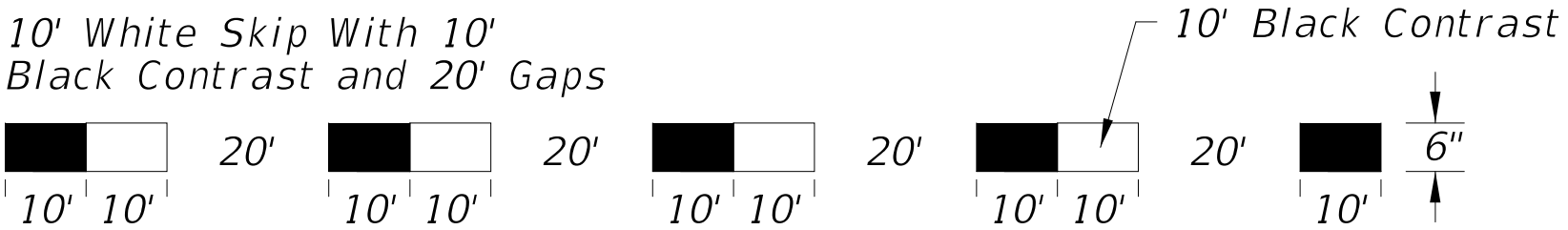
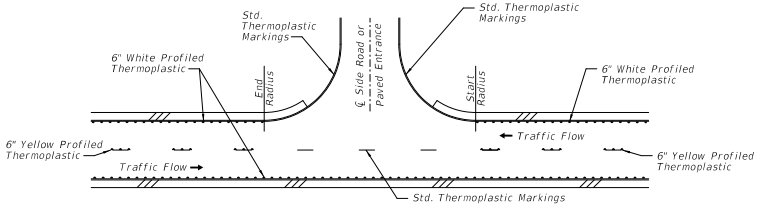
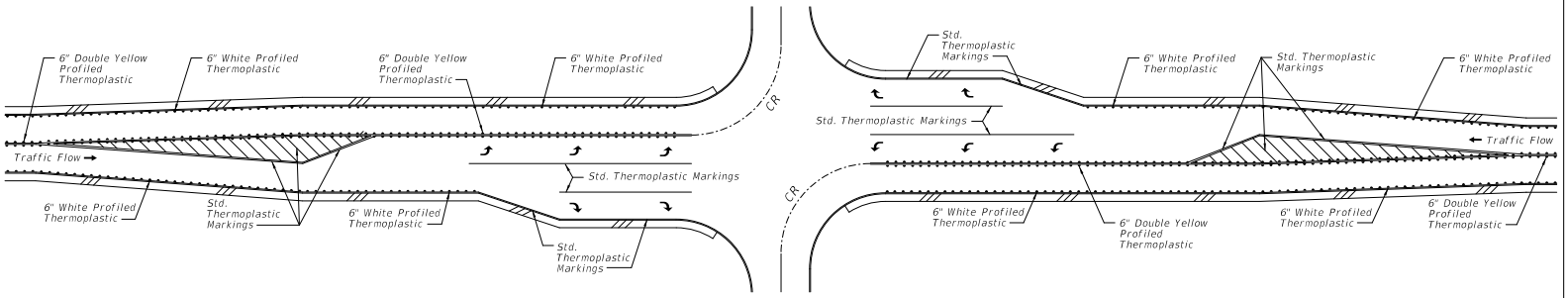


CONTRAST MARKINGS

Index 17346



TYPICAL RURAL INTERSECTION WITHOUT TURN LANES



TYPICAL RURAL INTERSECTION WITH TURN LANES

GENERAL NOTES:

1. Remove raised retroreflective pavement markers when in conflict with the installation of the centerline profiled thermoplastic pavement markings. The cost of removal is included in the cost of the profiled thermoplastic pavement marking.

2. Replacement of retroreflective pavement markers removed during the installation of the centerline profiled thermoplastic pavement markings will be paid for under Pay Item 706.

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PROFILED THERMOPLASTIC MARKINGS
2 LANE CONCRETE ROADWAYS

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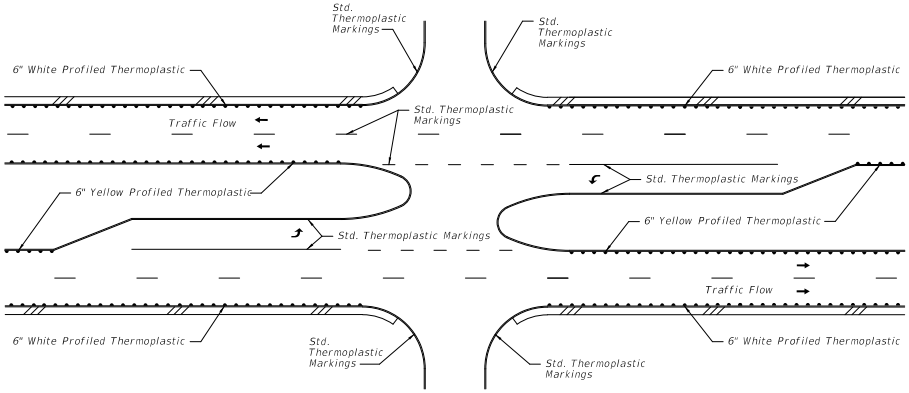
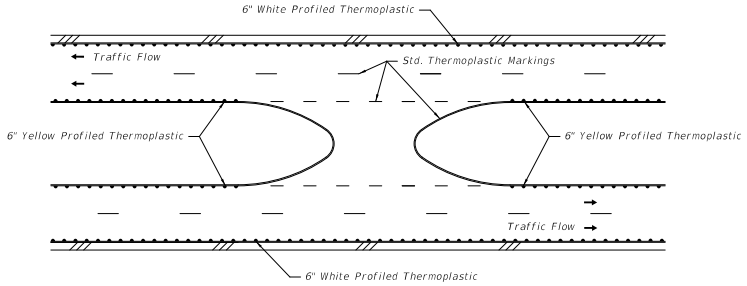
REFERENCE:

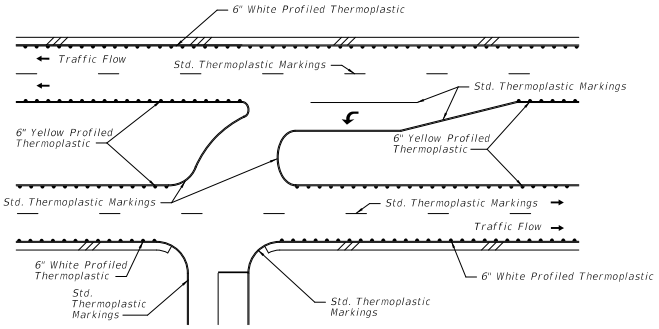
See Profiled Thermoplastic Markings General Notes on Sheet 13.



TYPICAL RURAL INTERSECTION



TYPICAL RURAL MEDIAN OPENING



TYPICAL RURAL DIRECTIONAL INTERSECTION

PROFILED THERMOPLASTIC MARKINGS
MULTI-LANE CONCRETE ROADWAYS

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Rumble Striping Details

Index Number (PDF)	Design Standards Revision (DSR)	Index Title	Design Information: Instructions for Design Stds (IDS) (PDF)	Design Information: Data Table Cell Library (ZIP)	Design Information: Borderless DGNs (ZIP) Terms of Use
		Complete eBooklet *(252mb)* 2016 Design Standards eBooklet	Combined Available IDS *(11mb)*	Combined Available CEL *(1mb)*	Combined DGN *(129mb)*
		COVER, TABLE OF CONTENTS AND REVISIONS			
515		Turnouts			DGN-00515
516		Turnouts - Resurfacing Projects			DGN-00516
517		Raised Rumble Strips			DGN-00517
518		Shoulder Rumble Strips			DGN-00518
519		Rumble Striping	IDS-00519		DGN-00519
521		Concrete Steps	IDS-00521		DGN-00521
525		Ramp Terminals			DGN-00525
526		Roadway Transitions			DGN-00526
527		Directional Median Openings			DGN-00527
530		Rest Area Pavilion			DGN-00530
532		Mailboxes			DGN-00532
535		Tractor Crossings			DGN-00535
540		Settlement Plate			DGN-00540

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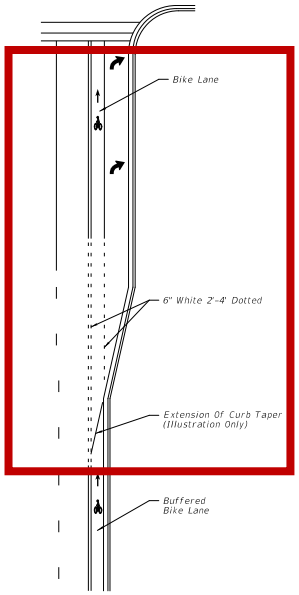
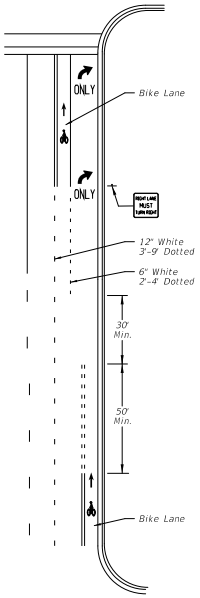
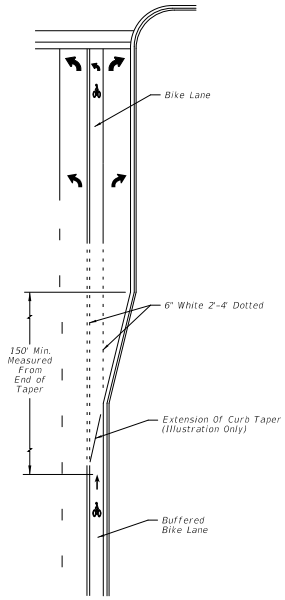


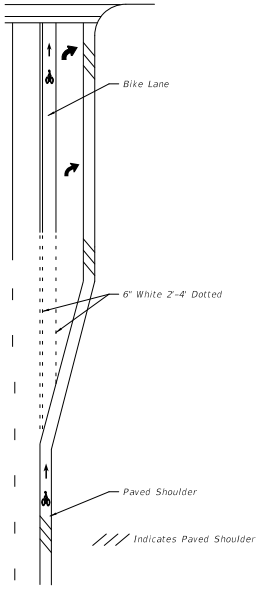
KH-1
INTERSECTION WITH
SEPARATE RIGHT TURN LANE,
CURB AND GUTTER TYPICAL SECTION



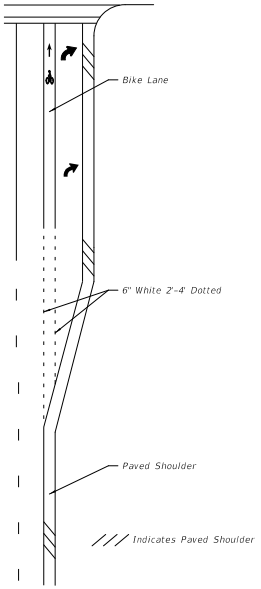
KH-2
INTERSECTION WITH
RIGHT TURN DROP LANE,
CURB AND GUTTER TYPICAL SECTION



KH-3
"TEE" INTERSECTION WITH
SEPARATE RIGHT TURN LANE,
CURB & GUTTER TYPICAL SECTION



KH-4
INTERSECTION WITH
SEPARATE RIGHT TURN LANE,
IN OR WITHIN ONE MILE OF AN URBAN AREA
FLUSH SHOULDER TYPICAL SECTION



KH-5
INTERSECTION WITH
SEPARATE RIGHT TURN LANE, IN RURAL AREA
FLUSH SHOULDER TYPICAL SECTION

KEYHOLE MARKINGS

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LAST REVISION 07/01/15	REVISION	DESCRIPTION:	FDOT 2016 DESIGN STANDARDS	BICYCLE MARKINGS	INDEX NO. 17347	SHEET NO. 5 of 5

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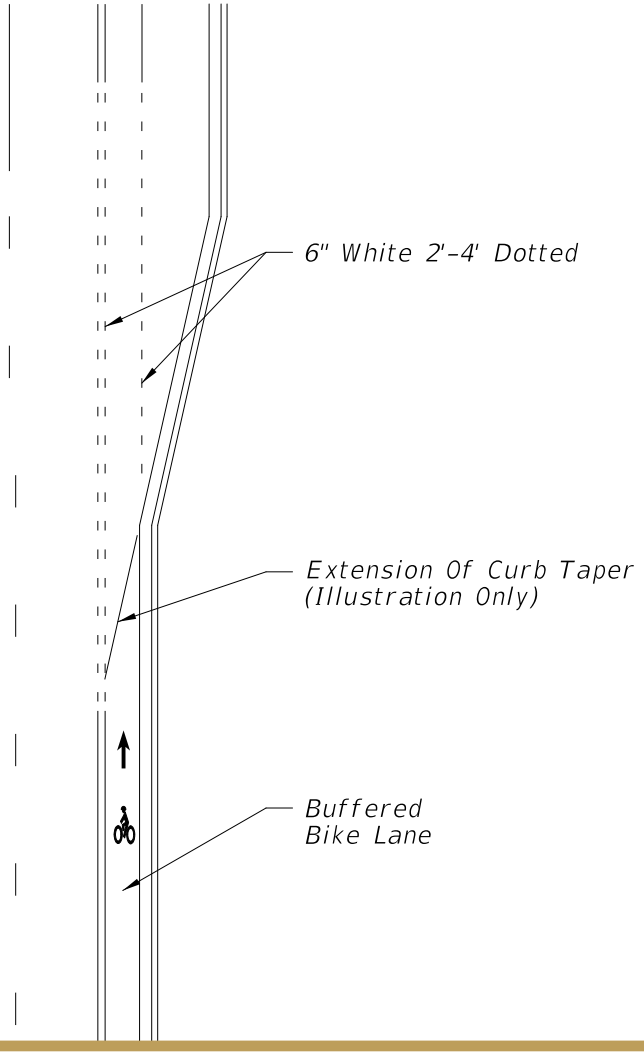
6" White 2'-4' Dotted
Extension Of Curb Taper
(Illustration Only)
Buffered
Bike Lane

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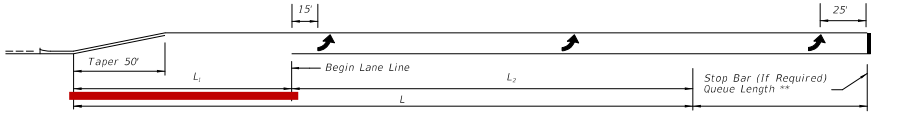
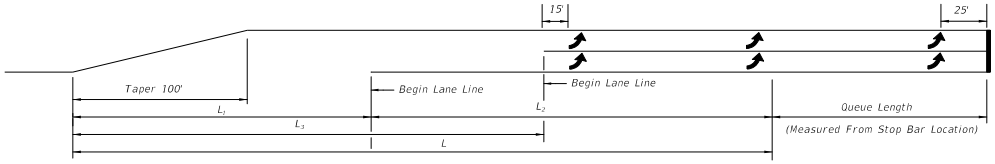


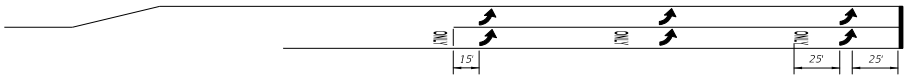
SINGLE LEFT TURNS

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



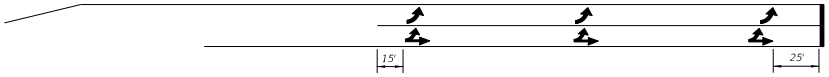
DOUBLE LEFT TURNS

	TURN LANES ◦ CURBED AND UNCURBED MEDIANS						
		URBAN CONDITIONS			RURAL CONDITIONS		
Design Speed (mph)	Clearance Distance L_1	Brake To Stop Distance L_2	Total Decel. Distance L	Clearance Distance L_3	Brake To Stop Distance L_2	Total Decel. Distance L	Clearance Distance L_3
35	70'	75'	145'	110'	— —	— —	— —
40	80'	75'	155'	120'	— —	— —	— —
45	85'	100'	185'	135'	— —	— —	— —
50	105'	135'	240'	160'	185'	290'	160'
55	125'	— —	— —	— —	225'	350'	195'
60	145'	— —	— —	— —	260'	405'	230'
65	170'	— —	— —	— —	290'	460'	270'



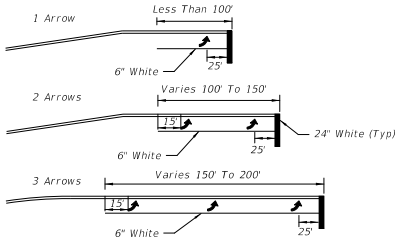
The ONLY pavement message is required for turn lanes, where the thru lane becomes turn lane.

Through Lane Becomes Exclusive Left Turn



Through Lane Becomes Optional Left Turn

DOUBLE LEFT TURN MARKINGS



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

ARROW SPACING

NOTES:

1. The "Begin Lane Line" locations are based on the standard lengths shown in Design Standard 301. These locations must be adjusted on a case by case basis for turn lanes not meeting the standard lengths.
2. Yellow left turn edge marking may be used adjacent to raised curb or grass medians if lane use is not readily apparent to drivers approaching a left turn storage lane.
3. Refer to Design Standard Index 301 for Roadway Details.
4. This Index also applies to right turn lanes.

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7/27/2015

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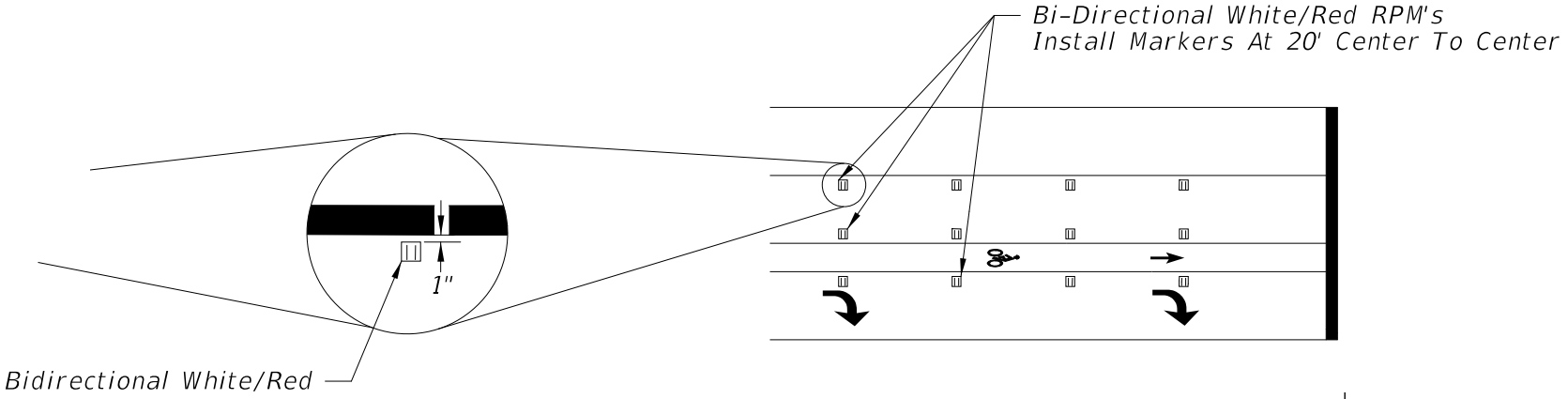
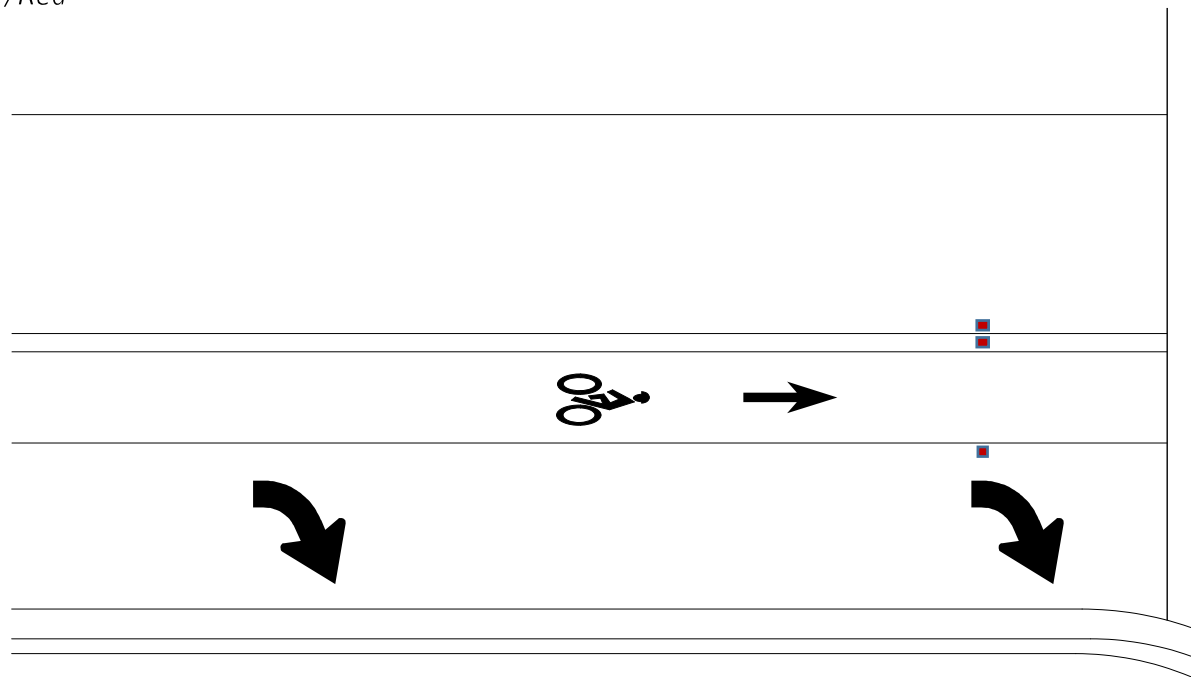

Bi-Directional White/Red RPM's
Install Markers At 20' Center To Center
1"
Bidirectional White/Red



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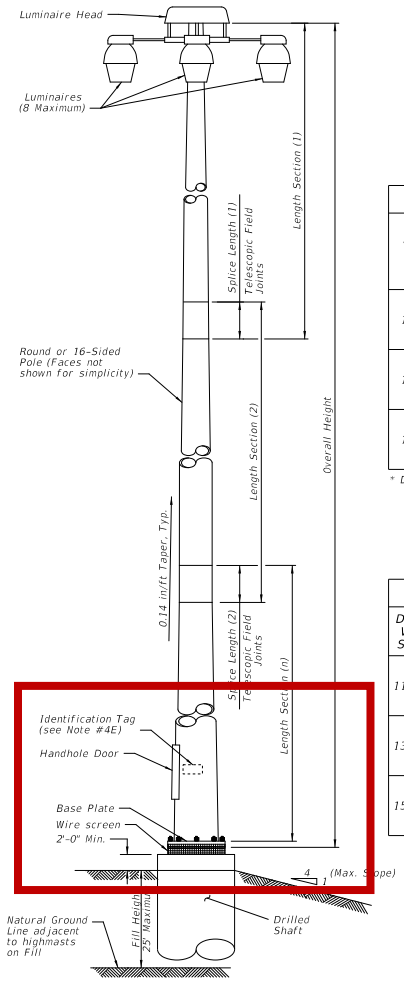

ELEVATION

POLE DESIGN TABLE*

Design Wind Speed	Pole Overall Height (ft)	SECTION 1 (TOP) Length	Wall Thickness (in.)	Minimum Splice L.	Tip Dia. (in.)	Base Dia. (in.)	SECTION 2 Length	Wall Thickness (in.)	Minimum Splice L.	Tip Dia. (in.)	Base Dia. (in.)	SECTION 3 Length	Wall Thickness (in.)	Minimum Splice L.	Tip Dia. (in.)	Base Dia. (in.)
110 mph	80	41'-9"	0.250	2'-0"	5.375	11.219	40'-0"	0.250	--	10.375	16.000	—	—	—	—	—
	100	24'-3"	0.179	2'-0"	6.438	9.844	40'-0"	0.250	2'-6"	9.188	14.781	40'-0"	0.250	—	13.875	19.500
	120	44'-6"	0.250	2'-0"	6.313	12.531	40'-0"	0.250	2'-9"	11.688	17.313	40'-0"	0.313	—	16.375	22.000
130 mph	80	41'-9"	0.250	2'-0"	5.344	11.188	40'-0"	0.313	--	10.375	16.000	—	—	—	—	—
	100	24'-3"	0.179	2'-0"	6.938	10.344	40'-0"	0.250	2'-6"	9.656	15.281	40'-0"	0.313	—	14.375	20.000
	120	45'-3"	0.250	2'-6"	9.281	15.625	40'-0"	0.250	3'-0"	14.719	20.344	40'-0"	0.313	—	19.375	25.000
150 mph	80	42'-0"	0.250	2'-3"	7.344	13.219	40'-0"	0.313	--	12.375	18.000	--	--	--	--	—
	100	24'-3"	0.250	2'-0"	8.219	11.625	40'-0"	0.313	2'-6"	10.781	16.406	40'-0"	0.375	—	15.375	21.000
	120	46'-3"	0.250	3'-0"	12.469	18.938	40'-0"	0.313	3'-6"	17.938	23.563	40'-0"	0.375	—	22.375	28.000

* Diameter Measured Flat to Flat

BASE PLATE AND BOLTS DESIGN TABLE

Design Wind Speed	Pole Overall Height (ft)	Base Plate Diameter (in.)	Base Plate Thickness (in.)	Bolt Circle (in.)	No. Bolts	Bolt Diameter (in.)	Bolt Embedment (in.)
110 mph	80	30.0	3.0	23.0	8	1.75	38
	100	33.5	3.0	26.5	8	1.75	42
	120	36.0	3.0	29.0	8	1.75	45
130 mph	80	30.0	3.0	23.0	8	1.75	43
	100	34.0	3.0	27.0	8	1.75	50
	120	41.0	3.5	33.0	8	2.00	52
150 mph	80	32.0	3.0	25.0	8	1.75	49
	100	37.0	3.0	29.0	8	2.00	53
	120	46.0	3.5	37.0	10	2.25	57

SHAFT DESIGN TABLE

Design Wind Speed	Pole Overall Height (ft)	Shaft Diameter	Shaft Length	Longitudinal Reinforcement
110 mph	80	4'-0"	13'-0"	14- #11
	100	4'-6"	14'-0"	16- #11
	120	4'-6"	16'-0"	16- #11
130 mph	80	4'-0"	14'-0"	14- #11
	100	4'-6"	16'-0"	16- #11
	120	5'-0"	17'-0"	18- #11
150 mph	80	4'-6"	15'-0"	16- #11
	100	4'-6"	17'-0"	16- #11
	120	5'-0"	20'-0"	18- #11

NOTE:
Foundation for slopes 1:4 or flatter. Provide a 2'-0" drilled shaft projection on the high side.

POLE DESIGN TABLES

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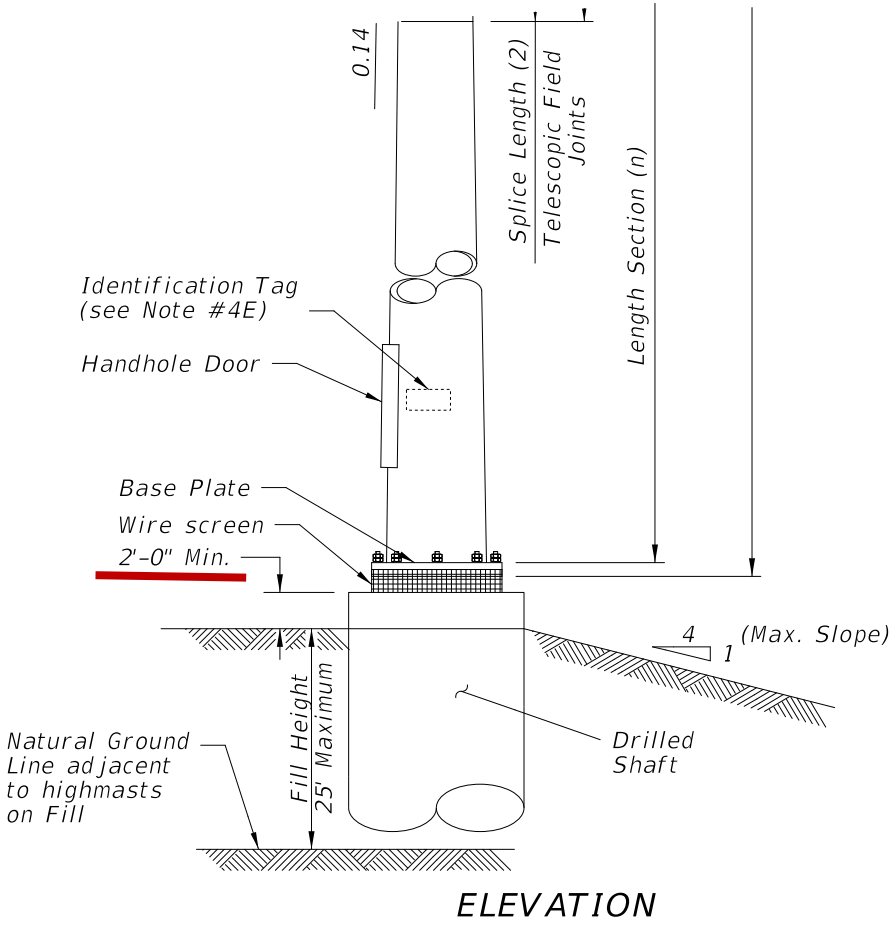

0.14
Splice Length (2)
Telescopic Field
Joints
Length Section (n)
Identification Tag
(see Note #4E)
Handhole Door
Base Plate
Wire screen
2'-0" Min.
4
1
(Max. Slope)
Fill Height
25' Maximum
Natural Ground
Line adjacent
to highmasts
on Fill
Drilled
Shaft
ELEVATION

Index 17723

NOTES:

1. Work with Index 17727 for grounding and span wire details. See the Plans for clamp spacing, cable sizes and forces, signals and sign mounting locations and details.

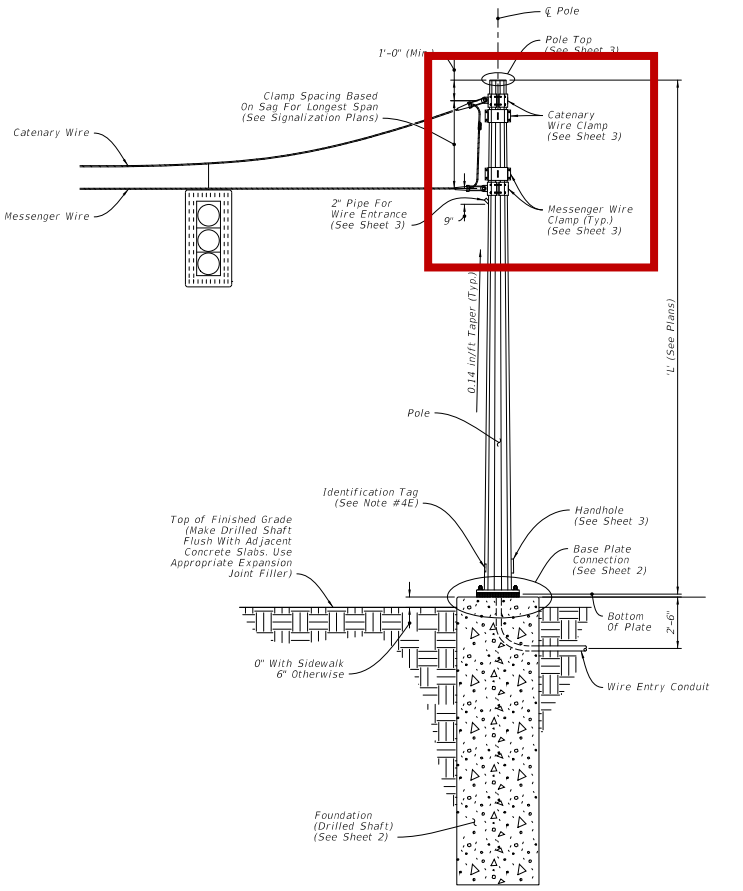
2. Shop Drawings: This Index is considered fully detailed, only submit shop drawings for minor modifications not detailed in the Plans.

3. Materials: Split-lock washers and self-locking nuts are not permitted
   A. Strain Pole and Backing Rings:
      a. Less than 7/16": ASTM A1011 Grade 50, 55, 60 or 65
      b. Greater than or equal to 7/16": ASTM A572 Grade 50, 55, 60 or 65
      c. ASTM A595 Grade A (55 ksi yield) or Grade B (60 ksi yield)
   B. Steel Plates: ASTM A36
   C. Weld Metal: E70XX
   D. Bolts, Nuts and Washers:
      a. High Strength Bolts: ASTM A325 Type 1
      b. Nuts: ASTM A563 Grade DH Heavy-Hex
      c. Washers: ASTM F436 Type 1, one under turned element
   E. Anchor Bolts, Nuts and Washers:
      a. Anchor Bolts: ASTM F1554 Grade 55
      b. Nuts: ASTM A563 Grade A Heavy-Hex (5 per anchor bolt)
      c. Plate Washers: ASTM A36 (2 per bolt)
   F. Handhole Frame: ASTM A709 or ASTM A36, Grade 36
   G. Handhole Cover: ASTM A1011 Grade 50, 55, 60 or 65
   H. Aluminum Pole Caps and Nut Covers: ASTM B26 (319-F)
   I. Stainless Steel Screws: AISI Type 316
   J. Threaded Bars/Studs: ASTM A36 or ASTM A307
   K. Concrete: Class IV (Drilled Shaft) for all environmental classifications.
   L. Reinforcing Steel: Specification Section 415

4. Fabrication:
   A. Pole Taper: Change diameter at a rate of 0.14 inches per foot.
   B. Upright splices are not allowed. Transverse welds are only permitted at the base.
   C. Provide bolt hole diameters as follows:
      a. Bolts (except Anchor Bolts): Bolt diameter plus 1/16", prior to galvanizing.
      b. Anchor Bolts: Bolt diameter plus 1/2", maximum.
   D. Locate handhole 180° from 2" wire entrance pipe.
   E. Identification Tag: (Submit details for approval.)
      a. 2"x 4" (Max.) aluminum identification tag.
      b. Locate on the inside of the pole and visible from the handhole.
      c. Secure to pole with 1/8" diameter stainless steel rivets or screws.
      d. Include the following information on the ID Tag:
         1. Financial Project ID
         2. Pole Type
         3. Pole height
         4. Manufacturers' Name
         5. Fy of Steel
         6. Base Wall Thickness
   F. Provide a 'J' or 'C' hook at the top of the pole for signal wiring support (See Sheet 3).
   G. Perform all welding in accordance with Specification Section 460-6.4.
   H. Hot Dip Galvanize after fabrication.

5. Coatings:
   A. All Nuts, Bolts, Washers and Threaded Bars/Studs: ASTM F2329
   B. All other steel items ASTM A123

6. Construction:
   A. Foundation: Specification Section 455, except that payment is included in the cost of the strain pole.
   B. After installation, place wire screen between top of foundation and bottom of baseplate in accordance with Specification Section 649-6.



STRAIN POLE ASSEMBLY

ELEVATION AND NOTES

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LAST REVISION 07/01/15	REVISION	DESCRIPTION:	FDOT 2016 DESIGN STANDARDS	STEEL STRAIN POLE	INDEX NO. 17723	SHEET NO. 1 of 3

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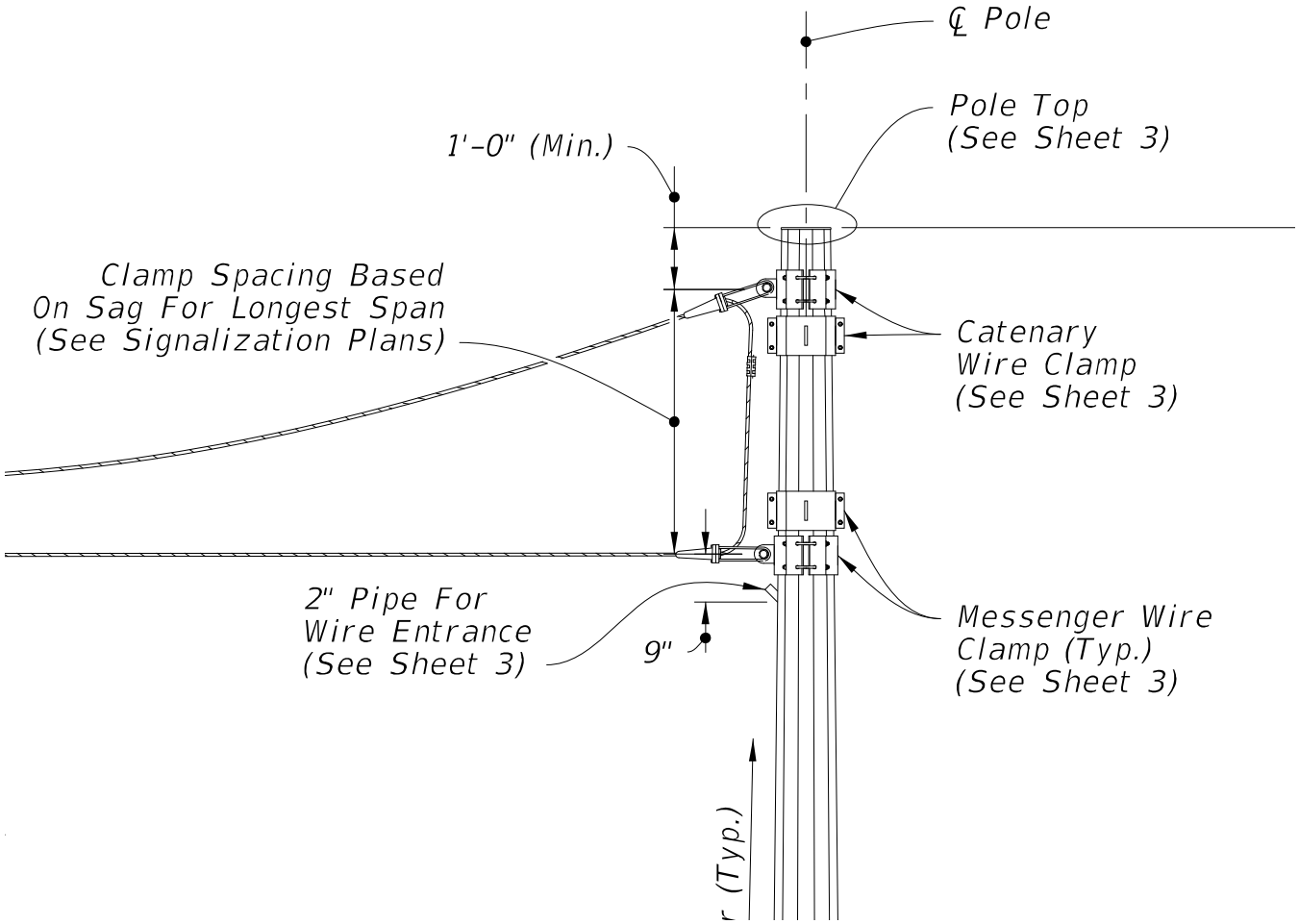
℄ Pole
Pole Top
(See Sheet 3)
1'-0" (Min.)
Clamp Spacing Based
On Sag For Longest Span
(See Signalization Plans)
Catenary
Wire Clamp
(See Sheet 3)
2" Pipe For
Wire Entrance
(See Sheet 3)
9"
Messenger Wire
Clamp (Typ.)
(See Sheet 3)
r (Typ.)

Questions

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