



Update Training

Signing, Pavement Marking, Signalization and Lighting

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Recent Policy Decisions & Design Bulletins

Chester Henson



Removal of Permanent Pavement Markings From Contracts With Durations Greater Than 365 Days

- Continue to Follow for 2012



Design Bulletin 11-12

High Performance Contrast Tape Skip Markings on Concrete

- **REQUIREMENT:** Contrast high performance tape shall be used for skip pavement markings on all new concrete pavement surfaces, except bridges, on projects with a minimum of $\frac{1}{2}$ mile of skip pavement markings.
- **IMPLEMENTATION:** Effective on all design-build and design-bid-build projects scheduled for letting beginning in January 2012 with new concrete pavements meeting the requirements above.



Plans Preparation Manual

Section 7.2.8.2

“High performance contrast tape markings shall be used for centerline markings on concrete pavements and concrete bridge decks (with lengths of 300’ or greater). For edge line markings on concrete pavements and bridges, the marking options include thermoplastic, high performance tapes and two-component reactive materials.”



Special Emphasis Crosswalks

- Special Task Team - Bicycle and Pedestrian Safety Initiatives
- Current Requirements
 - Required in Design Standards for All Midblock Crosswalks
 - Districts Can Use There Existing Policy for Intersection Crosswalks



New Manual of Uniform Traffic Control Devices (MUTCD)

- Officially Adopted 2009 MUTCD on Jan. 15, 2012



Design Standards Revisions

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Design Standards Revisions

- Index 11200 -
- Index 11870 – New Index
- Index 17302 -
- Index 17345 -
- Index 17346 -
- Index 17347 -
- Index 17501 -
- Index 17502 -
- Index 17700 – New Index



Index 11200

Multi-Column Ground Sign

**SIGN COLUMN & STUB COLUMN VIEWS
BASE CONNECTION**

SECTION A-A

BOLT KEEPER PLATE

SHIM DETAIL

BASE PLATE

Direction of Traffic

OPTIONAL HINGE **TYPICAL HINGE**

DETAIL B
(See Fabricator Note on Sheet 1)

FUSE PLATE **HINGE PLATE**

FOUNDATION ELEVATION

NOTE: All Reinforcing To Be Grade 60.

At the Option of the Contractor, D10 Spiral Wire @ 6" Pitch, Three Flat Turns Top and One Flat Turn Bottom may be Utilized in Lieu of Specified.

Shop-welded assemblies of foundation stirrup reinforcing bars are permitted in reinforced concrete foundation provided that:

- The reinforcing bars conform to ASTM Specification A601/608M.
- The holding wires conform to ASTM Specification A1064.
- The shop welding is performed by machines under a continuous, controlled process, approved by the Engineer.
- Quality control test are performed on shop welded specimens and the test results are available, upon request, to the Engineer.

PROCEDURE FOR ASSEMBLY OF BASE CONNECTION

- Assemble post to stub with bolts and flat washers as shown.
- Shim as required to plumb post (see shim detail).
- Tighten all L_4 bolts the maximum possible with 1'-0" to 1'-3" wrench to bed washers and shims and to clean bolt threads.
- Burr threads at junction with nut using a center punch to prevent nut loosening.

Section*	BASE CONNECTION DATA										FUSE (HINGE) PLATE DATA										SHIM		FOUNDATION DATA		
	A	B	C	D	R	t ₁	L ₁	w	Torque (ft-lb/in)	a	b	c	d	e	t ₁	D ₁	D ₂	L ₁	L	M	Dia	Depth	Stub Length	Reinf. Bars V	
S 3x5.7	4"	7"	3/4"	2"	5/16"	1"	1/2"	1/4"	90 ± 2	7-1/4"	2-3/8"	1-1/4"	1/2"	9/16"	3/8"	7/16"	9/16"	1/2"	1-1/4"	9/16"	2-0"	4-0"	3-0"	10-#6	
W 6x12	4"	10"	3/4"	2"	3/8"	1-3/8"	5/8"	1/4"	170 ± 4	7-1/4"	4"	1-1/4"	7/8"	15/16"	3/8"	13/16"	11/16"	5/8"	1-3/8"	11/16"	2-0"	6-0"	3-0"	10-#6	
W 8x18	5-1/4"	11-1/4"	7/8"	2-3/4"	7/16"	1-3/4"	3/4"	3/8"	445 ± 7	8-1/4"	5-1/4"	1-3/8"	1-1/8"	1-1/4"	3/8"	1"	13/16"	3/4"	1-3/4"	13/16"	2-4"	7-6"	4-0"	8-#8	
W 8x24	6-1/2"	12-1/2"	7/8"	3-1/4"	7/16"	1-3/4"	3/4"	3/8"	445 ± 7	8-1/4"	6-1/2"	1-3/8"	1-1/2"	1-1/2"	1/2"	1"	13/16"	3/4"	2-1/8"	13/16"	2-4"	8-0"	4-0"	8-#8	
W 10x33	8"	16"	1-1/4"	4-3/4"	9/16"	2"	1"	1/2"	580 ± 9	9-1/4"	8"	2"	1-3/4"	1-3/4"	5/8"	1-1/8"	1-1/16"	1"	2-3/8"	1-1/16"	2-4"	10-3"	4-0"	8-#8	
W 12x45	10"	18"	1-1/4"	6"	9/16"	2"	1"	1/2"	580 ± 9	11"	8"	2"	1-3/4"	1-3/4"	3/4"	1-5/16"	1-1/16"	1"	2-3/4"	1-1/16"	2-8"	11-3"	5-0"	10-#8	

STEEL POST, BASE, FOUNDATION & FUSE PLATE DETAILS

LAST REVISION: 01/01/12

FDOT DESIGN STANDARDS
FY 2012/2013

INDEX NO. 11200

SHEET NO. 2



Index 11200

Multi-Column Ground Sign

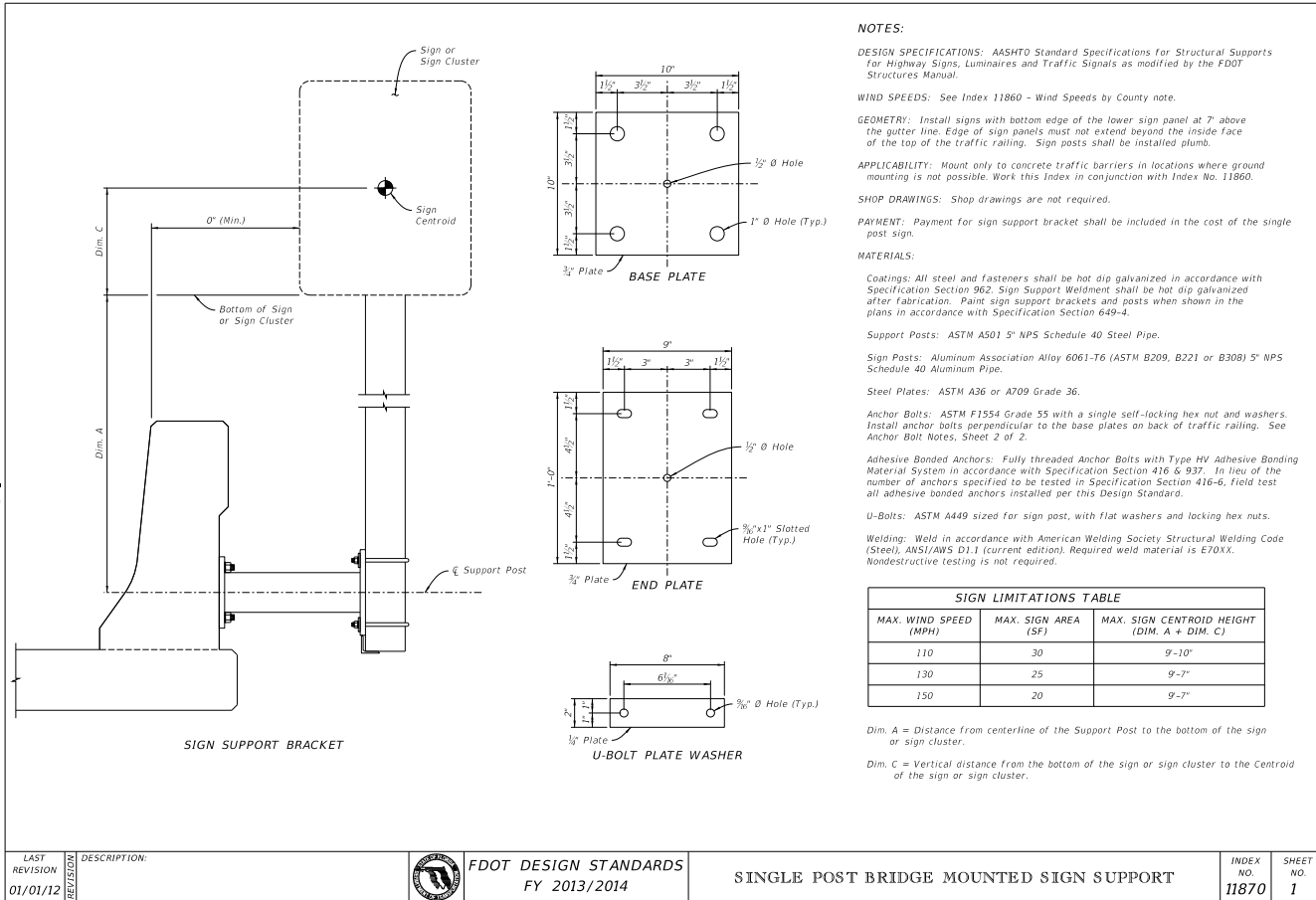
BASE CONNECTION DATA

<i>Section*</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>R</i>	<i>t₁</i>	<i>L₂</i>	<i>Torque (lbf*in)</i>
<i>S 3x5.7</i>	<i>4"</i>	<i>7"</i>	<i>3/4"</i>	<i>2"</i>	<i>5/16"</i>	<i>1"</i>	<i>1/2"</i>	<i>90 ± 20</i>
<i>W 6x12</i>	<i>4"</i>	<i>10"</i>	<i>3/4"</i>	<i>2"</i>	<i>3/8"</i>	<i>1-5/8"</i>	<i>5/8"</i>	<i>270 ± 45</i>
<i>W 8x18</i>	<i>5-1/4"</i>	<i>11-1/4"</i>	<i>7/8"</i>	<i>2-3/4"</i>	<i>7/16"</i>	<i>1-3/4"</i>	<i>3/4"</i>	<i>445 ± 75</i>
<i>W 8x24</i>	<i>6-1/2"</i>	<i>12-1/2"</i>	<i>7/8"</i>	<i>3-1/4"</i>	<i>7/16"</i>	<i>1-3/4"</i>	<i>3/4"</i>	<i>445 ± 75</i>
<i>W 10x33</i>	<i>8"</i>	<i>16"</i>	<i>1-1/4"</i>	<i>4-3/4"</i>	<i>9/16"</i>	<i>2"</i>	<i>1"</i>	<i>580 ± 90</i>
<i>W 12x45</i>	<i>10"</i>	<i>18"</i>	<i>1-1/4"</i>	<i>6"</i>	<i>9/16"</i>	<i>2"</i>	<i>1"</i>	<i>580 ± 90</i>



Index 11870

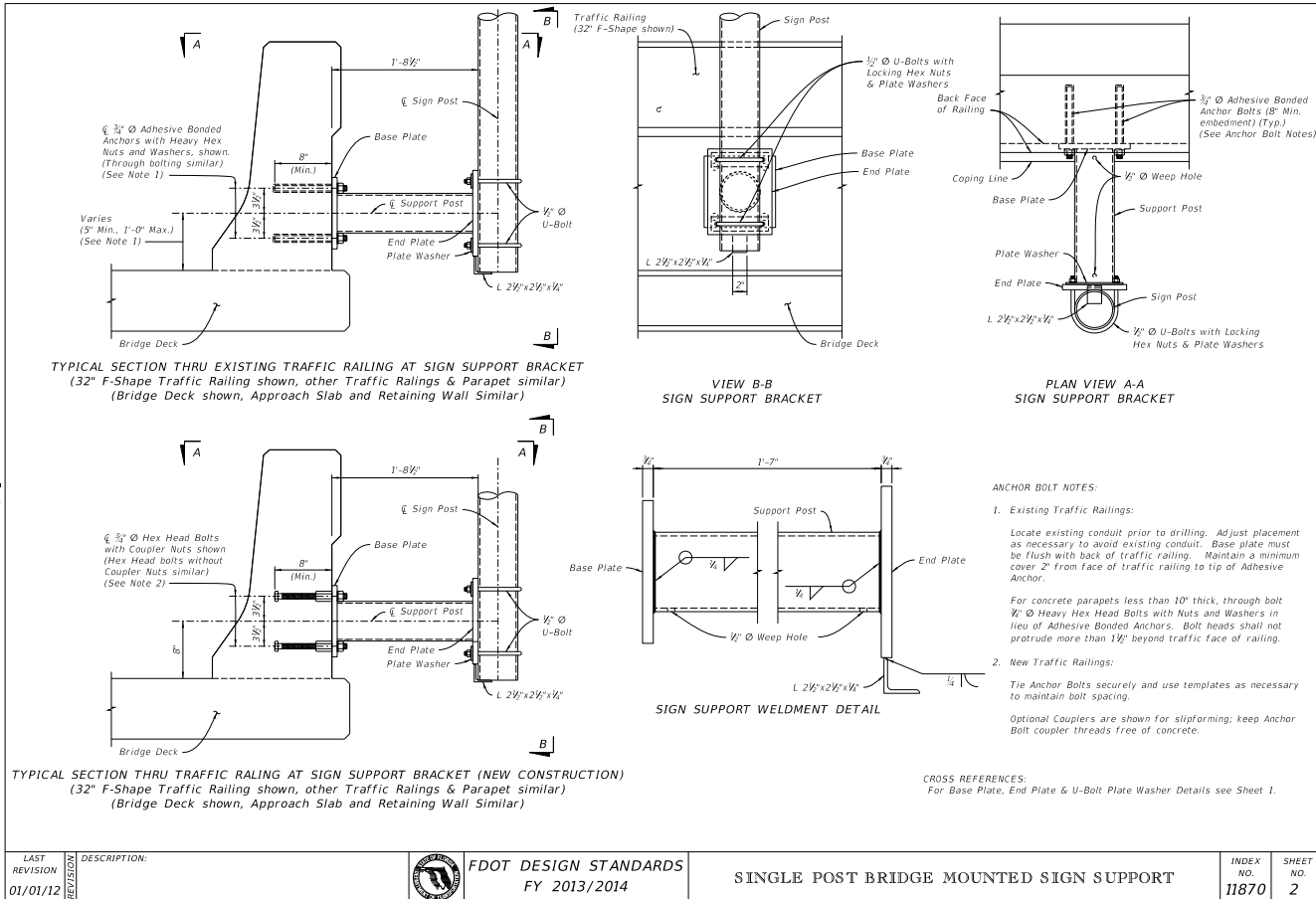
Single Post Bridge Mounted Sign





Index 11870

Single Post Bridge Mounted Sign



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Index 11870

Single Post Bridge Mounted Sign

Sign Posts: Aluminum Association Alloy 6061-T6 (ASTM B209, B221 or B308) 5" NPS Schedule 40 Aluminum Pipe.

<i>SIGN AREA & WIND SPEED TABLE</i>	
<i>WIND SPEED MAX. (mph)</i>	<i><u>MAX. SIGN SIZE</u> (sf)</i>
<i>110</i>	<i>30</i>
<i>130</i>	<i>25</i>
<i>150</i>	<i>20</i>



Index 17302

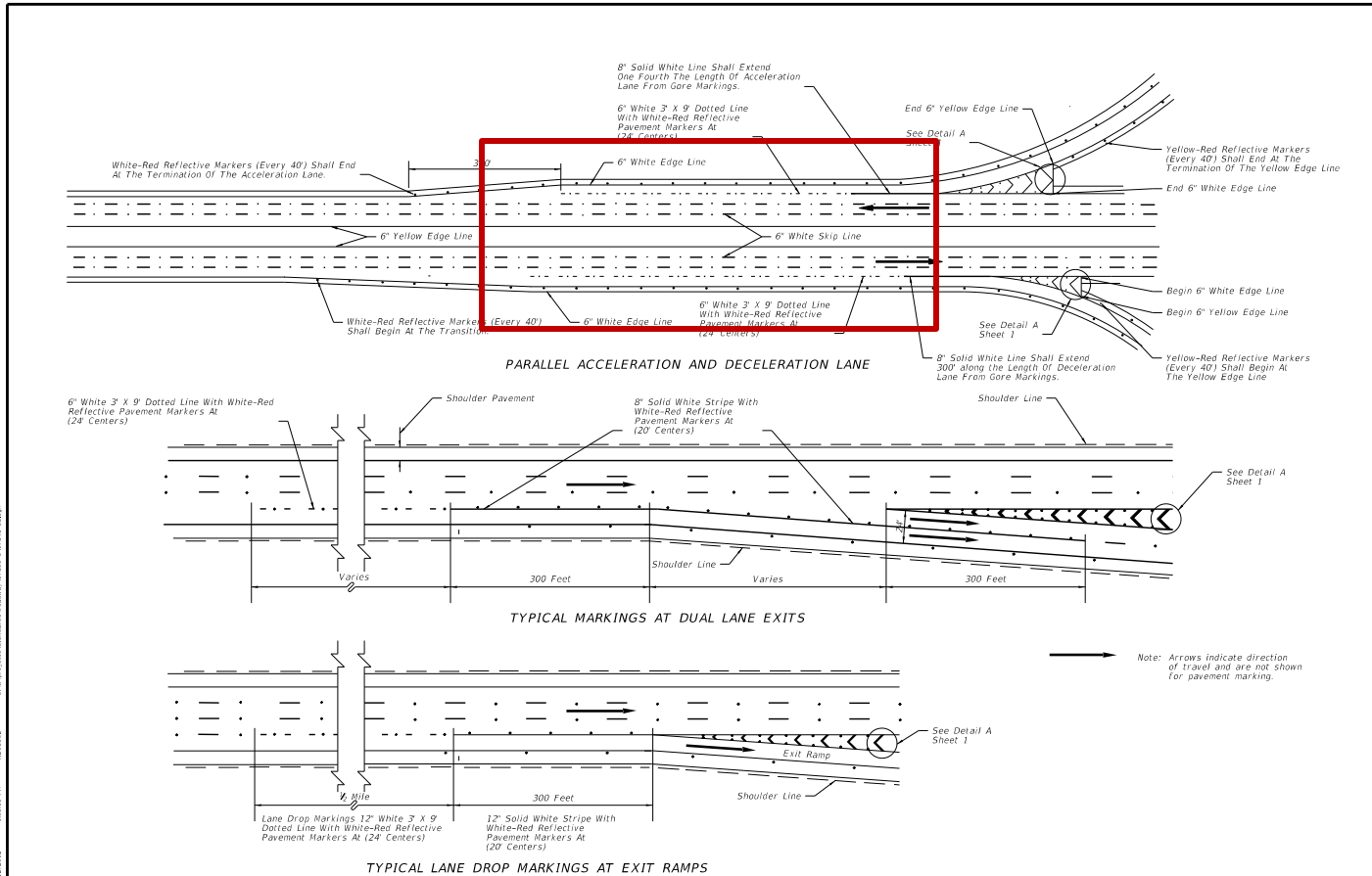
Placement of Single & Multi-Column Signs

<p>CASE I For Use On Freeway And Expressway Systems For Signs On Mainline.</p> <p>For Median Installation: If Median Width Does Not Allow Std. Offset From Both Roadways, Center Sign In Median.</p>	<p>CASE II For Use In All Rural Roads And On Freeway And Expressway Ramps.</p> <p>14' Horizontal Clearance Standard On All Freeway And Expressway Ramps.</p>	<p>CASE III For Use On All Roads With Signs Mounted Behind Sidewalk.</p>	<p>GENERAL NOTES:</p> <ol style="list-style-type: none"> The typical sections shown hereon serve as a guide for locating the traffic signs required under various roadside conditions. For size and details of sign construction and footing, refer to the appropriate standard index drawing for roadside signs. It shall be the CONTRACTORS responsibility to verify the length of sign supports in the field prior to fabrication. Ground signs shall be installed at an angle of 1 to 4 degrees away from the traffic flow (see illustration). Shoulder mounted signs shall be rotated counterclockwise and median mounted signs rotated clockwise. Signs on curves shall be mounted as noted above from the perpendicular to the motorist line of sight. 	
<p>CASE IV (MERGE SIGN) For Use On All Rural, Freeway And Expressway Systems.</p>	<p>CASE V For Use In Business Or Residential Areas Only.</p>	<p>CASE VI For Use On All Roadways With Signs Behind Guardrail.</p>	<ol style="list-style-type: none"> The setback for stop and yield signs may be reduced to 3' minimum from the driving lane if required for visibility in business or residential sections with no curb and speeds of 30 MPH or less. The mounting heights are measured from the bottom of the sign panel to a horizontal line extended from the edge of the driving lane. If the standard heights cannot be met, the minimum heights are as follows: Expressway & Freeway Systems 7' Other Roadway Systems 5' Rural (including residential with parking and for pedestrian activity) 7' If a secondary sign is mounted below the major sign, the major sign shall be at least 8' and the secondary sign at least 5' for expressway & freeway systems and for other systems the height to the secondary sign shall be at least 5' for rural and 7' for urban sections. Sign supports should never be placed in the bottom of ditches where erosion might affect the proper operation of the breakaway feature. Sign supports shall not reduce the accessible route /continuous passage to less than 4' min. clear width as required by the Americans with Disabilities Act (ADA) Accessibility Guidelines. 	
<p>CASE VII (REST AREA & EXIT GORE SIGNS) For Use On All Freeway And Expressway Systems</p>	<p>CASE VIII Sign On Island or Curbed Median</p> <p>Center Sign Column On Island</p>	<p>CASE IX (MILE POST MARKER) For More Information Refer To Section 2H Of The Manual On Uniform Traffic Control Devices</p>		
<p>LAST REVISION 01/01/12</p>	<p>DESCRIPTION:</p>	<p>FDOT DESIGN STANDARDS FY 2012/2013</p>	<p>TYPICAL SECTIONS FOR PLACEMENT OF SINGLE & MULTI-COLUMN SIGNS</p>	<p>INDEX NO. 17302</p> <p>SHEET NO. 1</p>



Index 17345

Interchange Markings



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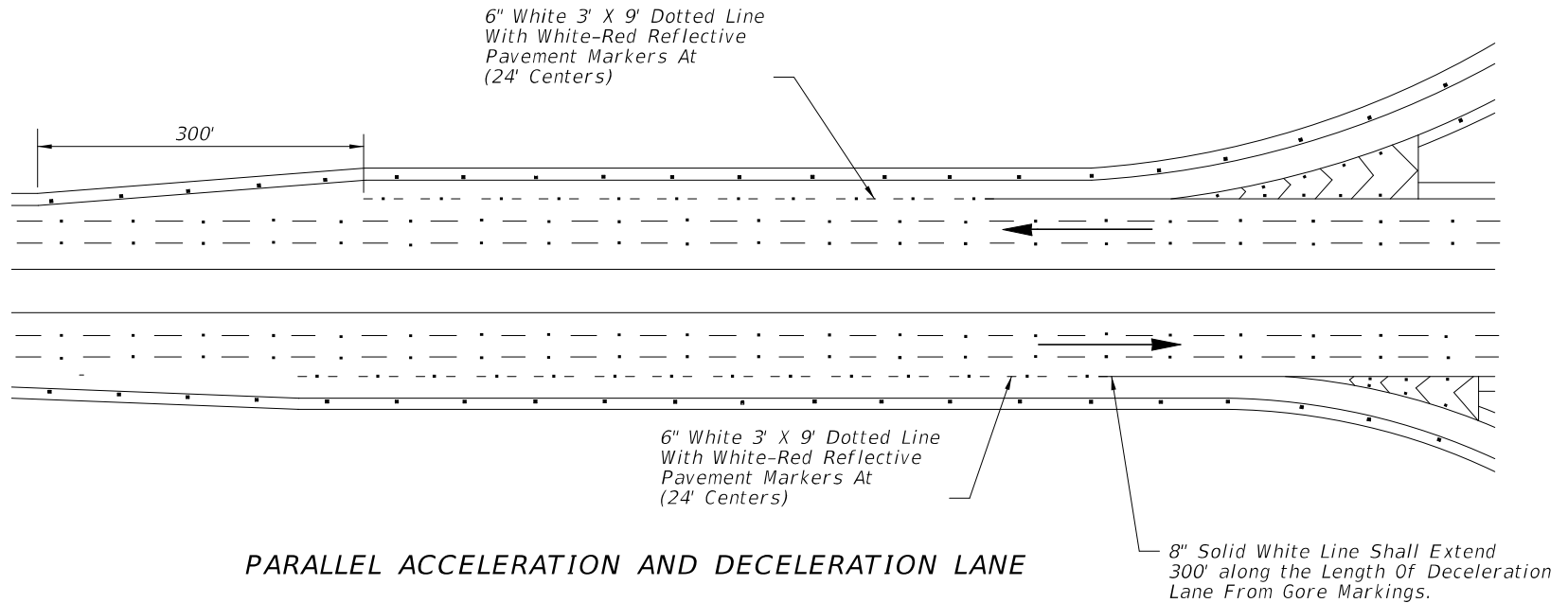
LAST REVISION 07/01/10	DESCRIPTION:	FDOT DESIGN STANDARDS FY 2012/2013	INTERCHANGE MARKINGS	INDEX NO. 17345	SHEET NO. 3
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Index 17345

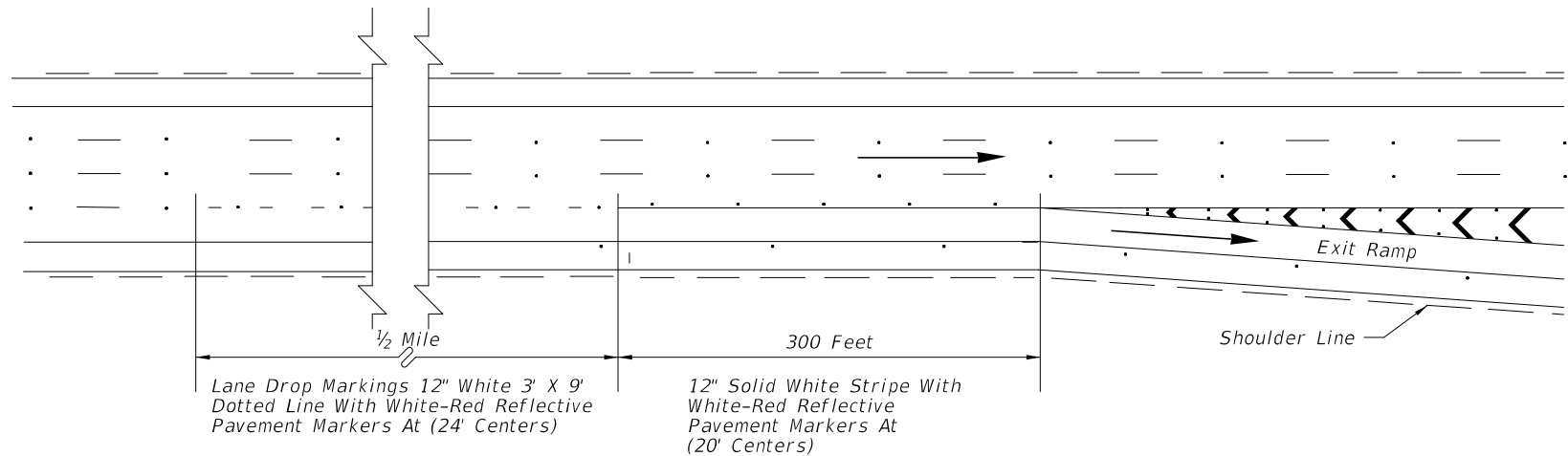
Interchange Markings





Index 17345

Interchange Markings

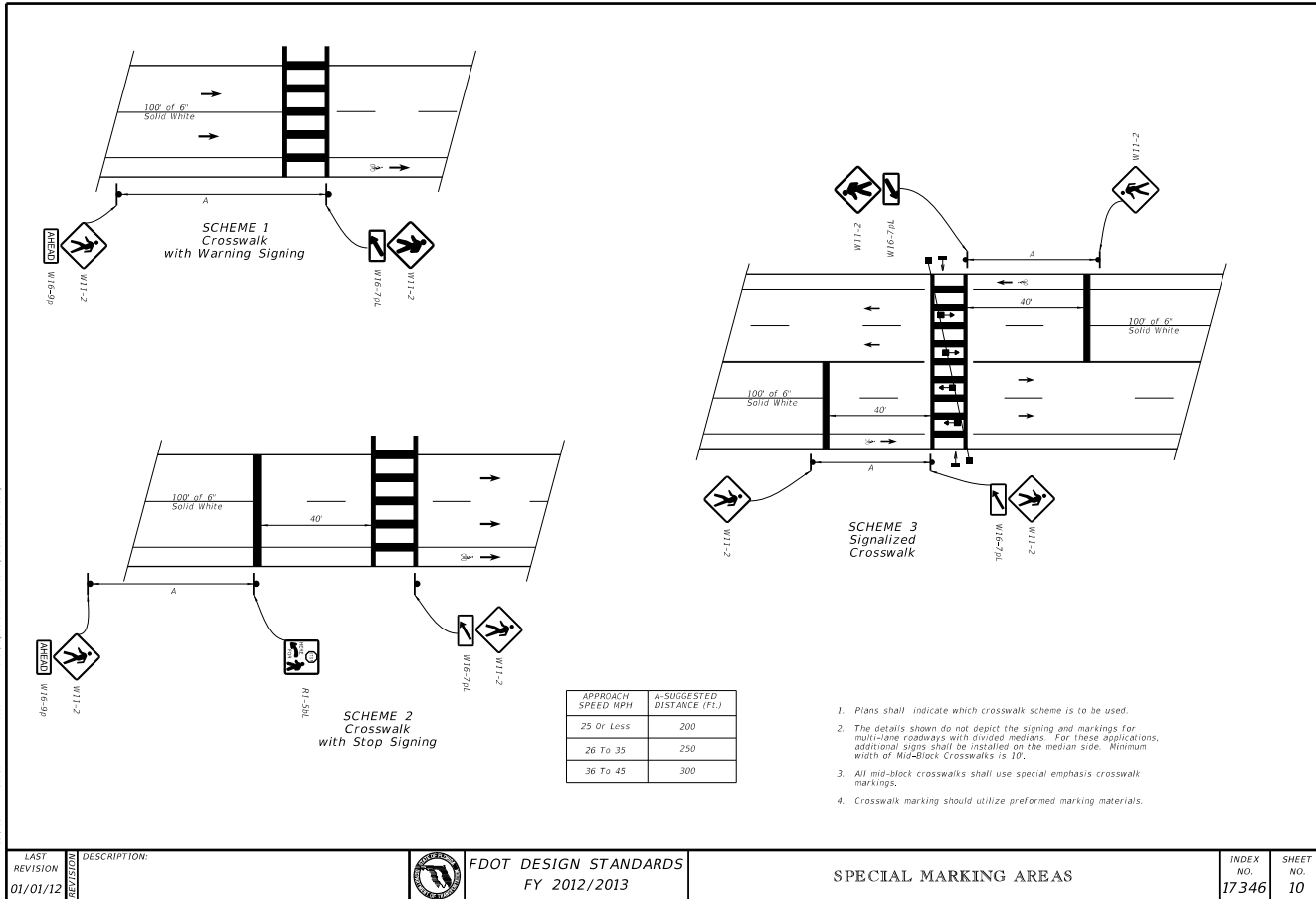


TYPICAL LANE DROP MARKINGS AT EXIT RAMPS



Index 17346

Special Marking Areas



LAST REVISION
01/01/12

DESCRIPTION:



FDOT DESIGN STANDARDS
FY 2012/2013

SPECIAL MARKING AREAS

INDEX NO.
17346

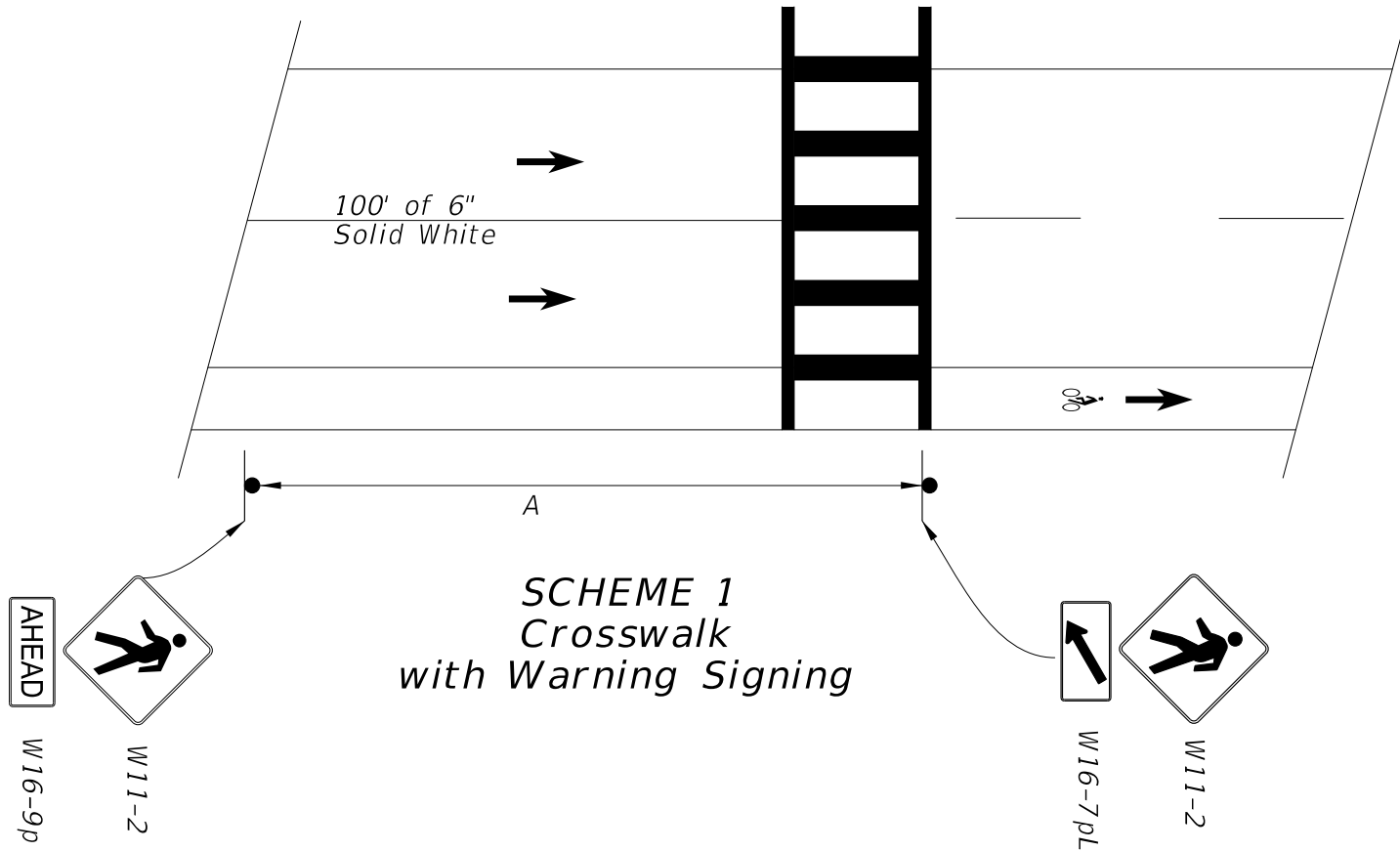
SHEET NO.
10

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Index 17346

Special Marking Areas

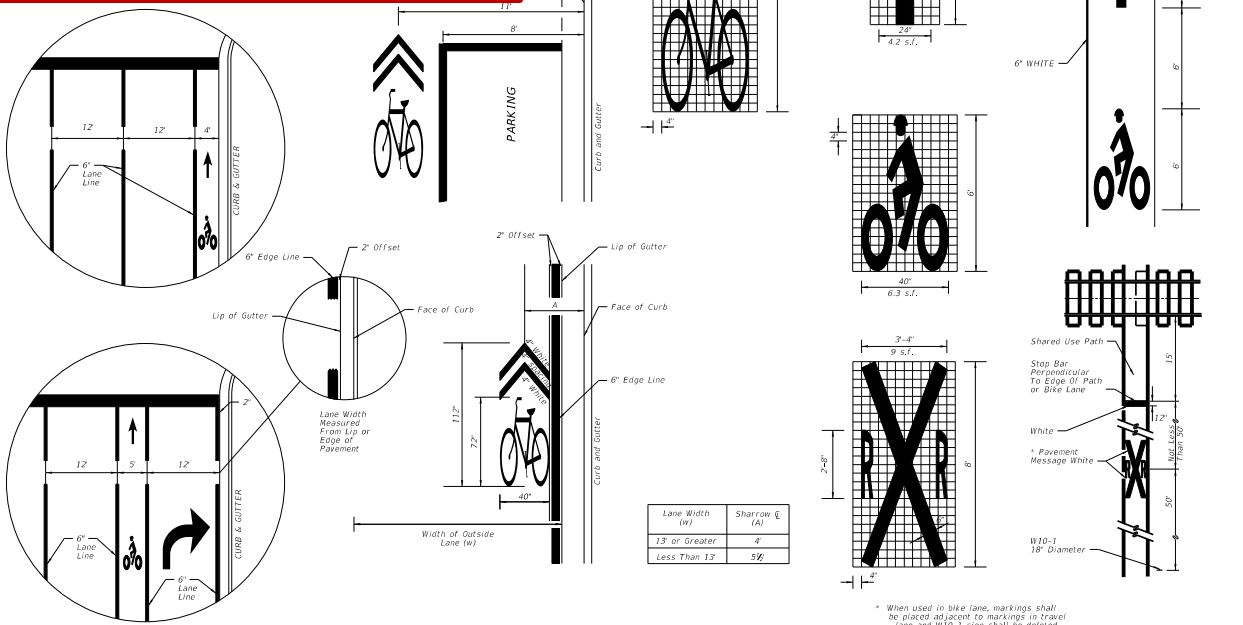


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Index 17347 Bicycle Markings

- Recommended placement of bicycle lane markings:
 - At the beginning of a bicycle lane, on the far side of major intersections, and prior to and within the bicycle lane keyhole.
 - Along the roadway as needed to provide a maximum spacing of 1,320 feet for posted speeds less than 45 mph, 2,640 feet for a posted speed of 45 mph or greater.
- Recommended spacing for shared lane marking symbols: Immediately after intersections and at a maximum spacing of 250 feet.
- All pavement markings and pavement messages shall be White.
- All pavement messages shall be preformed thermoplastic.
- Bike lane signs (R3-17, R3-17a, R3-17b) are not required.



Lane Width (w)	Narrow Lane (N)
13' or Greater	4
Less Than 13	5W

* When used in bike lane, markings shall be placed adjacent to markings in travel lane and W10-1 sign shall be deleted.

LAST REVISION 01/01/12

DESCRIPTION:

FDOT DESIGN STANDARDS
FY 2012/2013

BICYCLE MARKINGS

INDEX NO. 17347
SHEET NO. 1



Index 17347

Bicycle Markings

1. Recommended placement of bicycle lane markings:
 - a) At the beginning of a bicycle lane, on the far side of major intersections, and prior to and within the bicycle lane keyhole.
 - b) Along the roadway as needed to provide a maximum spacing of 1,320 feet for posted speeds less than 45 mph, 2,640 feet for a posted speed of 45 mph or greater.
2. Recommended spacing for shared lane marking symbols: Immediately after intersections and at a maximum spacing of 250 feet.
3. All pavement markings and pavement messages shall be White.
4. All pavement messages shall be preformed thermoplastic.
5. Bike lane signs (R3-17, R3-17a, R3-17b) are not required.



Index 17501

Highway Lighting General Notes (Old)

- 1) All grounding system connections shall be exothermically welded. This includes all cables, ground electrode and arrays. Do not exothermically bond grounding electrode to grounding electrode. Method of Measurement and Basis of Payment as per Section 620 of the Standard Specifications.
- 2) The contractor shall be responsible for contacting all utility companies prior to any underground work. The utility company will locate and identify their facilities.
- 3) Contractor shall determine the service required date for the power company transformer installation at the pre-construction conference.
- 4) The power company reserves the right to install the riser, switch gear and weatherhead on power company poles at the expense of the contractor. Contact the power company for cost or for authorization for an alternate procedure.
- 5) Any damaged portions of galvanized steel poles and bracket arms shall be painted in accordance with Section 562 of the Standard Specifications.
- 6) Poles and bracket arms shall be designed in accordance with the design criteria, as indicated in the plans and using the applicable equations found in the AASHTO 'Standard Specifications For Structural Supports For Highway Signs, Luminaires And Traffic Signals' and FDOT Structures Manual. The calculations shall be based on the actual projected area of the luminaire or 3.0 square feet whichever is greater.
- 7) The luminaire manufacturer shall place a permanent tag on the luminaire housing on which is imprinted the following information: Wattage, ballast type, lamp shown on design plans, lamp setting (position of luminaire), IES light distribution with this lamp in the position specified, input voltage and power factor. Luminaire photometric submittals required.
- 8) Before final acceptance, contractor shall provide 2 sets of full size as built plans to the maintaining agency.
- 9) Conduit routing shall be pole to pole, maintaining pole setback distance from edge of pavement. Any cable routing in locations where guardrail is proposed shall be 2' in front of the standard guardrail position.
- 10) Pole positions and conduit routing may be adjusted, as approved by the Engineer, to prevent conflicts with utility and drainage structures not indicated, and prevent guardrail post conflict with underground lighting circuits.
- 11) Where guardrail is constructed, the poles shall be placed a minimum of 4' behind the face of the guardrail.
- 12) Install pole foundations in accordance with Section 715 of the Standard Specifications.
- 13) All splices shall be made in pullboxes or the pole base. No splices shall be made inside the conduit. The wires at pullboxes shall have sufficient length to completely remove connectors to the outside of pullboxes remove connectors to the outside of pullboxes to make connectors accessible for changing fuses and trouble shooting the system.

- 14) Neutral wires to have white insulation. Do not use white or green insulated wires for ungrounded conductors.
- 15) Unless otherwise specified, all cable shall be single conductor, 98 percent conductivity stranded copper, with THW or THWN insulation.
- 16) All exposed or surfaced mounted conduit shall be rigid or intermediate metal. These exposed runs of conduit shall be provided with either expansion joints or flexible metal conduit sections adequate to take care of vibrations and thermal expansions. All metal conduit shall be grounded. Steel conduit shall be hot-dipped galvanized.
- 17) All conduit that will remain empty as spares shall be mandrel tested, cleaned inside and both ends capped. Leave the corrosion resistant pull/drag wire and place pullboxes to mark the location of the ends of the conduits.
- 18) Pullboxes shall be located at ends of conduit crossing roadways, and as necessary for the completion of the project.
- 19) These plans represent minimum acceptable criteria. The inspection per these drawings represent the minimum base of acceptance.
- 20) All material, unless otherwise specified, shall be Underwriters Laboratory approved.
- 21) Pullboxes shall meet the requirements of Section 635 of the 'Standard Specifications For Road And Bridge Construction' and Section 635 of the 'Minimum Specifications For Traffic Control Signals And Devices'.
- 22) A pullbox shall be installed at each pole location. Pullboxes should be located 2' max from pole unless otherwise directed by the project engineer. Metal pullbox covers shall be grounded. See General Requirements Section 635-5 of the Standard Specifications for Road and Bridge Construction.
- 23) At all pullboxes and pole bases, ends of conduit shall be sealed in accordance with Section 630 of the Standard Specifications for Road and Bridge Construction.
- 24) Luminaire shall be supplied with a regulator type ballast mounted on a hinged door or panel. The unit shall swing open to provide access to the ballast assembly by release of captive screws. The electrical connector shall be a quick disconnect plug. The unit shall be easily removed from the luminaire after release of captive screws and disconnect plug.
- 25) All mounting heights are $\pm 2'-6"$ unless otherwise noted in plans.
- 26) A handhole is required in all poles. Handhole should be located opposite approaching traffic with cover fastened with Stainless Steel Screws. The handhole opening shall be at least 20 square inches.
- 27) The luminaire and arm on joint use poles shall be grounded.

BREAKAWAY FEATURE

All conventional mounting height poles shall be mounted on a frangible metal base. The base shall be one piece and be designed to breakaway without the aid of any slipping or sliding surfaces. The design of the breakaway feature shall be in accordance with the breakaway performance requirements of the AASHTO 'Standard Specifications For Structural Supports For Highway Signs, Luminaires and Traffic Signals'. The contractor (supplier) shall submit copies of test reports as evidence the breakaway feature meets the above specifications and calculations to verify the design will meet the AASHTO wind loading specified in the contract plans. No poles are to be installed prior to approval of submittal data. Any substantial remains of a breakaway support, when it is broken away, should not project more than 4" as discussed in Section 7 of the above AASHTO Specifications, and, Chapter 4, Section 4.2 of the AASHTO 'Roadside Design Guide'. Poles behind bridge rail or barrier wall mounted, shall be non-frangible.

SURGE PROTECTOR SPECIFICATIONS

1. The unit shall withstand a surge current up to 20,000 Amps, and repetitive surges of 200 Amps for a minimum of 10,000 occurrences.
2. The unit shall respond in less than 50 nanoseconds and within this time have a peak clamping voltage better than 1,100 Vrms.
3. The maximum allowable voltage that can pass continuously through the hot leg of the protector must be less than 550 Vrms.
4. The current drain shall be less than 100 microamps.
5. The unit shall be insulated 600 V to ground and shall be weatherproof.
6. The unit shall not allow holdover current or conduction to ground after the surge ends.
7. Protection shall be achieved for both the 480 V and neutral conductors with the surges being passed to ground and NDT to neutral.
8. There shall be no discharge lag in the protection of the 480 V conductor over the neutral conductor.
9. Underwriters Laboratory approval not required.



2010 FDOT Design Standards

HIGHWAY LIGHTING GENERAL NOTES

Last Revision 07/01/09	Sheet No. 1 of 1
Index No. 17501	

Chester Henson



Index 17501

Highway Lighting General Notes (New)

GENERAL NOTES

1. All grounding system connections shall be exothermically welded. This includes all cables, ground electrode and arrays. Do not exothermically bond grounding electrode to grounding electrode. Method of Measurement and Basis of Payment as per Section 620 of the Standard Specifications.
2. The contractor shall be responsible for contacting all utility companies prior to any underground work. The utility company will locate and identify their facilities.
3. Contractor shall determine the service required date for the power company transformer installation at the pre-construction conference.
4. The power company reserves the right to install the riser, switch gear and weatherhead on power company poles at the expense of the contractor. Contact the power company for cost or for authorization for an alternate procedure.
5. Any damaged portions of galvanized steel poles and bracket arms shall be painted in accordance with Section 562 of the Standard Specifications.
6. Before final acceptance, contractor shall provide 2 sets of full size as built plans to the maintaining agency.
7. Conduit routing shall be pole to pole, maintaining pole setback distance from edge of pavement. Any cable routing in locations where guardrail is proposed shall be 2' in front of the Standard guardrail position.
8. Pole positions and conduit routing may be adjusted, as approved by the Engineer, to prevent conflicts with utility and drainage structures not indicated, and prevent guardrail post conflict with underground lighting circuits.
9. Where guardrail is constructed, the poles shall be placed a minimum of 4' behind the face of the guardrail.
10. Install pole foundations in accordance with Section 715 of the Standard Specifications.
11. All splices shall be made in pull boxes or the pole base. No splices shall be made inside the conduit. The wires at pullboxes shall have sufficient length to completely remove connectors to the outside of pull boxes remove connectors to the outside of pull boxes to make connectors accessible for changing fuses and trouble shooting the system.
12. Neutral wires to have white insulation. Do not use white or green insulated wires for ungrounded conductors.
13. All exposed or surfaced mounted conduit shall be rigid or intermediate metal. These exposed runs of conduit shall be provided with either expansion joints or flexible metal conduit sections adequate to take care of vibrations and thermal expansions. All metal conduit shall be grounded. Steel conduit shall be hot-dipped galvanized.
14. All conduit that will remain empty as spares shall be mandrel tested, cleaned inside and both ends capped. Leave the corrosion resistant pull/drag wire and place pull boxes to mark the location of the ends of the conduits.
15. Pull boxes shall be located at ends of conduit crossing roadways, and as necessary for the completion of the project.
16. These plans represent minimum acceptable criteria. The inspection per these drawings represent the minimum base of acceptance.
17. All material, unless otherwise specified, shall be Underwriters Laboratory approved.
18. A pull box shall be installed at each pole location. Pull boxes should be located 2' max from pole unless otherwise directed by the project engineer. Metal pull box covers shall be grounded. See General Requirements Section 635-5 of the Standard Specifications for Road and Bridge Construction.
19. At all pull boxes and pole bases, ends of conduit shall be sealed in accordance with Section 630 of the Standard Specifications for Road and Bridge Construction.
20. All mounting heights are $\pm 2-4"$ unless otherwise noted in plans.
21. A handhole is required in all poles. Handhole should be located opposite approaching traffic with cover fastened with Stainless Steel Screws. The handhole opening shall be at least 20 square inches.
22. The luminaire and arm on joint use poles shall be grounded.


BREAKAWAY FEATURE

All conventional mounting height poles shall be mounted on a frangible metal base. The base shall shall be one piece and be designed to breakaway without the aid of any slipping or sliding surfaces. The design of the breakaway feature shall be in accordance with the breakaway performance requirements of the AASHTO Standard Specifications For Structural Supports For Highway Signs, Luminaires and Traffic Signals. The contractor (supplier) shall submit copies of test reports as evidence the breakaway feature meets the above specifications and calculations to verify the design will meet the AASHTO wind loading specified in the contract plans. No poles are to be installed prior to approval of submittal data.

Any substantial remains of a breakaway support, when it is broken away, should not project more than 4" as discussed in Section 7 of the above AASHTO Specifications, and, Chapter 4, Section 4.2 of the AASHTO Roadside Design Guide.

Poles behind bridge rail or barrier wall mounted, shall be non-frangible.

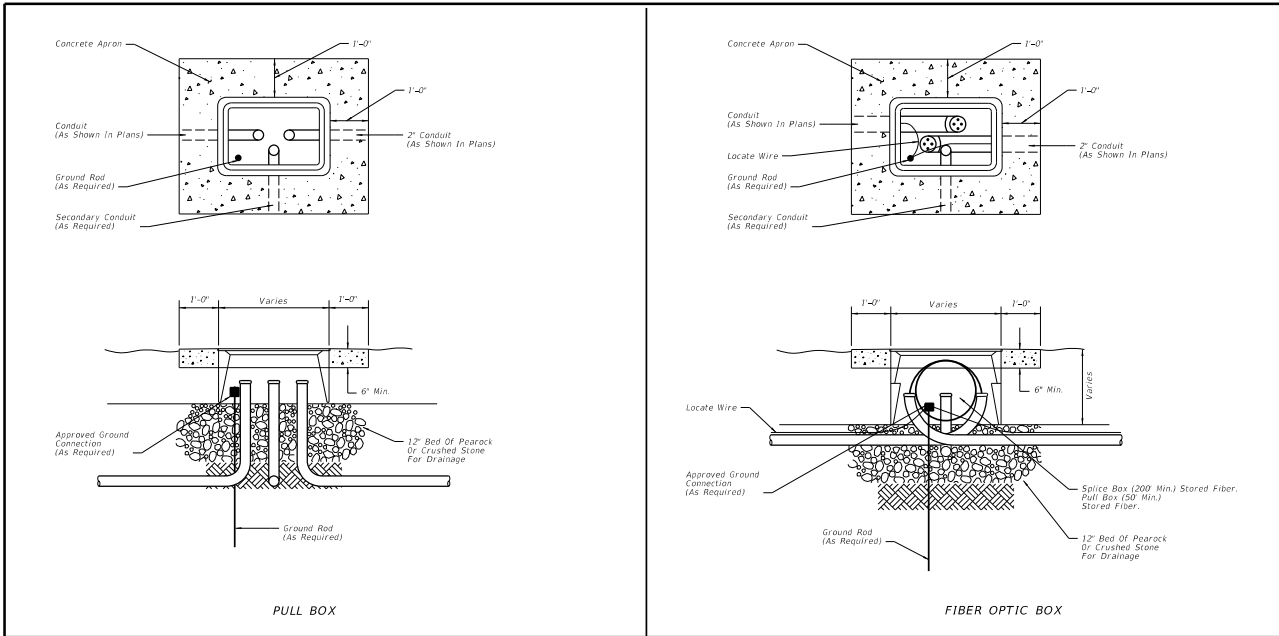
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LAST REVISION	DESCRIPTION:	 FDOT DESIGN STANDARDS FY 2012/2013	HIGHWAY LIGHTING GENERAL NOTES	INDEX NO. 17501	SHEET NO. 1
07/01/08					



Index 17700

Pull, Splice and Junction Boxes



1. Boxes shall not be installed in roadways or driveways.
2. Boxes shall be on the Approved Product List (APL).
3. Boxes shall be installed flush with the finished grade surface.
4. Fiber optic splice boxes shall be provided with cable hanger racks designed to support cables and splice enclosures. Cost of racks to be included in cost of splice box.
5. Fiber optic boxes shall contain only Fiber Optic Cable, Conduit, and Locate Wire.

6. Conduit center line shall be aligned to top edge of box to facilitate cable pulling.
7. All boxes shall have 1'-0" wide (min) concrete apron. Concrete for concrete aprons shall be Class NS with a minimum strength at 28 days of f'c=25 Ksi. Aprons shall be sloped away from box. Cost of apron to be included in the cost of each box.
8. Prevent the ingress of Water, Dirt, Sand, and other foreign materials into the conduit prior to, during and after construction using a foam-sealing material, rubber plug, or other device designed for this application and approved.

LAST REVISION
01/01/11

DESCRIPTION:



FDOT DESIGN STANDARDS
FY 2012/2013

PULL, SPLICE AND JUNCTION BOX

INDEX NO.
17700

SHEET NO.
1

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Plans Preparation Manual Revisions

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Specification Revisions

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Things To Come

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Things To Come

- Horizontal Pavement Signing



Horizontal Pavement Signing



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Things To Come

- Horizontal Pavement Signing
- Policy on Optional Use of Cantilever Guide Signs



Questions

If you have any questions, please feel free to contact us.



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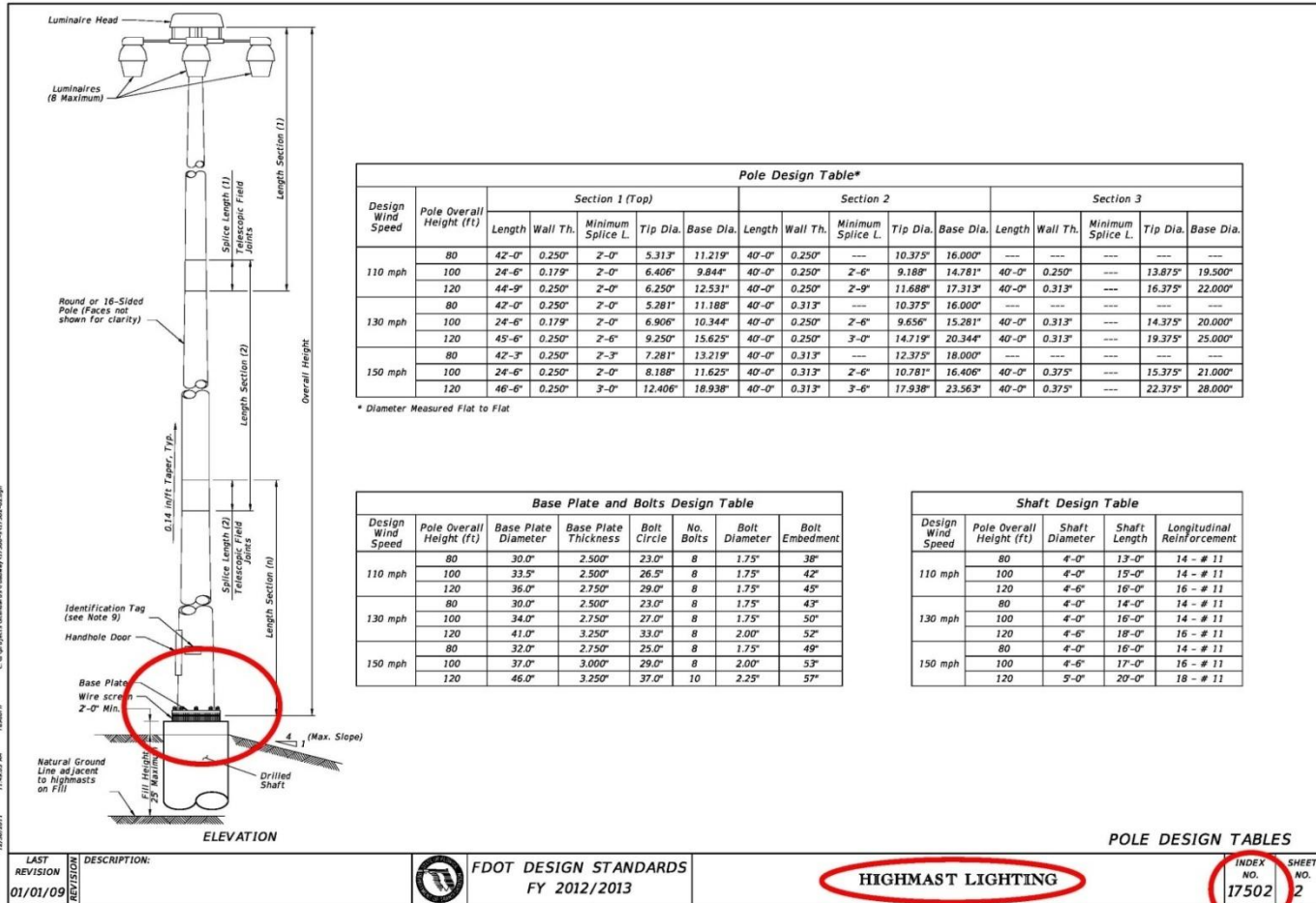


Tube-to-Transverse Plate connections

- old – fillet welds
- new – full penetration groove weld
- 17502 – Highmast light poles
- 17723 – Steel Strain poles
- 17745 – Mast Arm traffic signal poles



Tube-to-Transverse Plate connections



POLE DESIGN TABLES

LAST REVISION 01/01/09	DESCRIPTION:	FDOT DESIGN STANDARDS FY 2012/2013	HIGHMAST LIGHTING	INDEX NO. 17502	SHEET NO. 2
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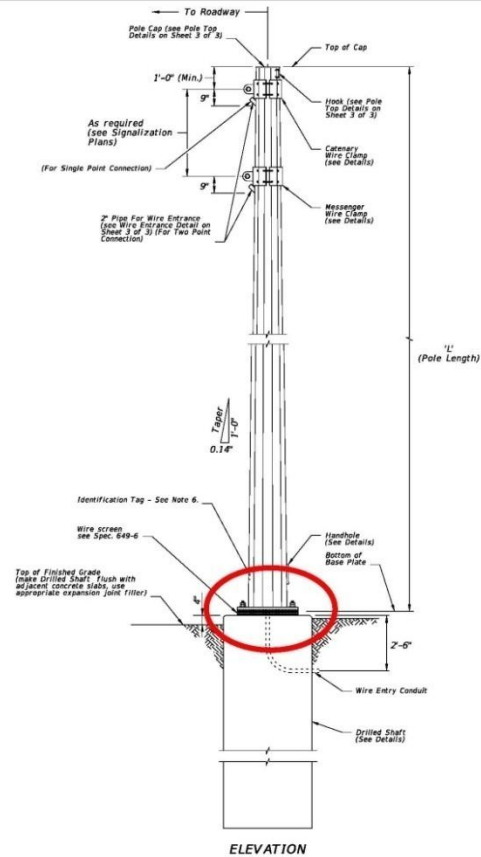
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Tube-to-Transverse Plate connections

STEEL STRAIN POLE NOTES

- 1) Designed in accordance with FDOT Structures Manual.
- 2) Perform all welding in accordance with the American Welding Society Structural Welding Code (Steel) ANSI/AWS D1.1 (current edition). No field welding is permitted on any part of the pole.
- 3) See Standard Index No. 17727 for grounding and span wire details.
- 4) Foundation Materials:
 - a. Reinforcing Steel: ASTM A615 Grade 60.
 - b. Concrete: Class IV, (Drilled Shaft) 4,000 psi (f'c) minimum Compressive Strength at 28-days for all environmental classifications.
 - c. Anchor Bolts: ASTM F1554 Grade 55 with ASTM A563 Grade A heavy-hex nuts and plate washers (all galvanized in accordance with ASTM F2329).
- 5) Strain Pole Specifications:
 - a. Poles: ASTM A1011 Grade 50, 55, 60 or 65 (less than 3/4") or ASTM A572 Grade 50, 55, 60, or 65 (1/4" and over) or ASTM A595 Grade A (55 ksi yield) or Grade B (60 ksi yield).
 - b. Steel Plates: ASTM A36.
 - c. Weld Metal: E70XX.
 - d. Bolts: A325, Type I. Hole Diameter: Bolt diameter plus 3/64".
 - e. Base Plate: Hole Diameter: anchor bolt diameter plus 3/8".
 - f. Handhole: Frame: ASTM A709 Grade 36 or ASTM A36, Cover: ASTM A1011 Grade 50, 55, 60 or 65.
 - g. Aluminum Caps and Covers: ASTM B-26 (319-F).
 - h. Stainless Steel Screws: AISI Type 316.
 - i. Galvanization: All nuts, bolts and washers: ASTM F2329, All other steel: ASTM A123.
- 6) Pole Notes:
 - a. See the Signalization Plans for clamp spacing, cable sizes and forces, signal and sign mounting locations and details.
 - b. Tapered with the diameter changing at a rate of 0.14 inch per foot.
 - c. Transverse welds are allowed only at the base.
 - d. Poles constructed out of two or more sections with overlapping splices are not permitted.
 - e. Locate the handhole 180 degrees from 2-inch wire entrance pipe.
 - f. Furnish each pole with a 2"x4" (max) aluminum identification tag. Submit details for approval. Secure to pole with 0.125" stainless steel rivets or screws. Locate identification tag on the inside of pole and visible from handhole. Include the following information:
Financial Project ID, Pole Type, Pole Height, Manufacturer's Name, F of Steel and Base Wall Thickness.
- 7) One hundred percent of full-penetration groove welds and a random 25 percent of partial penetration groove welds shall be inspected. Full-penetration groove weld inspection shall be performed by nondestructive methods of radiography or ultrasonics.
- 8) In accordance with specification S-14.2, shop drawings are only required for additions, deletions, or modifications to this Design Standard.
- 9) Verify CSL access tubes will not interfere with anchor bolt installation before excavating the shaft. When CSL access tube locations conflict with anchor bolt locations, move the CSL access tube location ± two inches along the inner circumference of the reinforcing cage. Notify the Engineer before excavating the shaft if the CSL access tube locations cannot be moved out of conflict with anchor bolt locations.



ELEVATION
ELEVATION AND NOTES

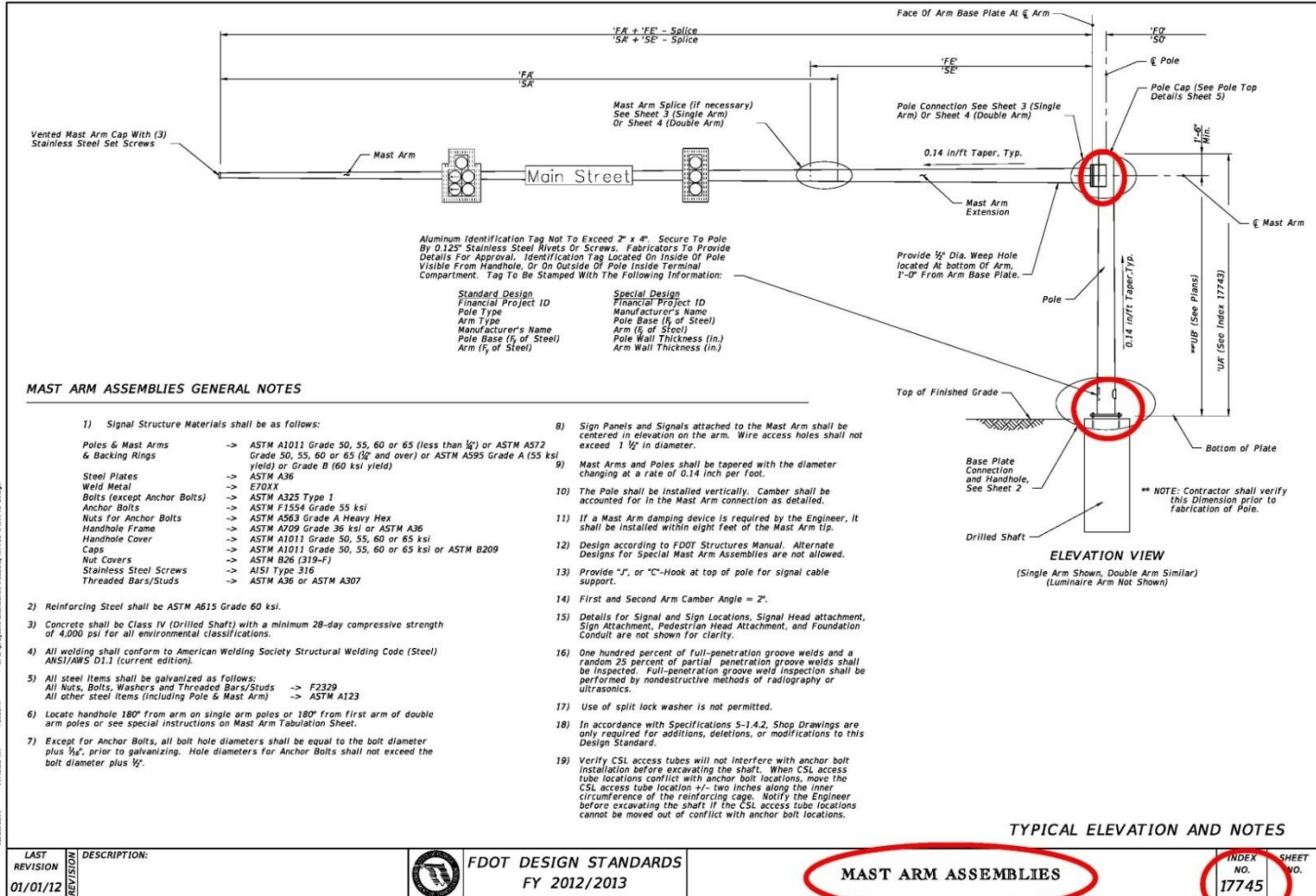
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LAST REVISION 01/01/12	DESCRIPTION:	FDOT DESIGN STANDARDS FY 2012/2013	STEEL STRAIN POLE	INDEX NO. 17723	SHEET NO. 1
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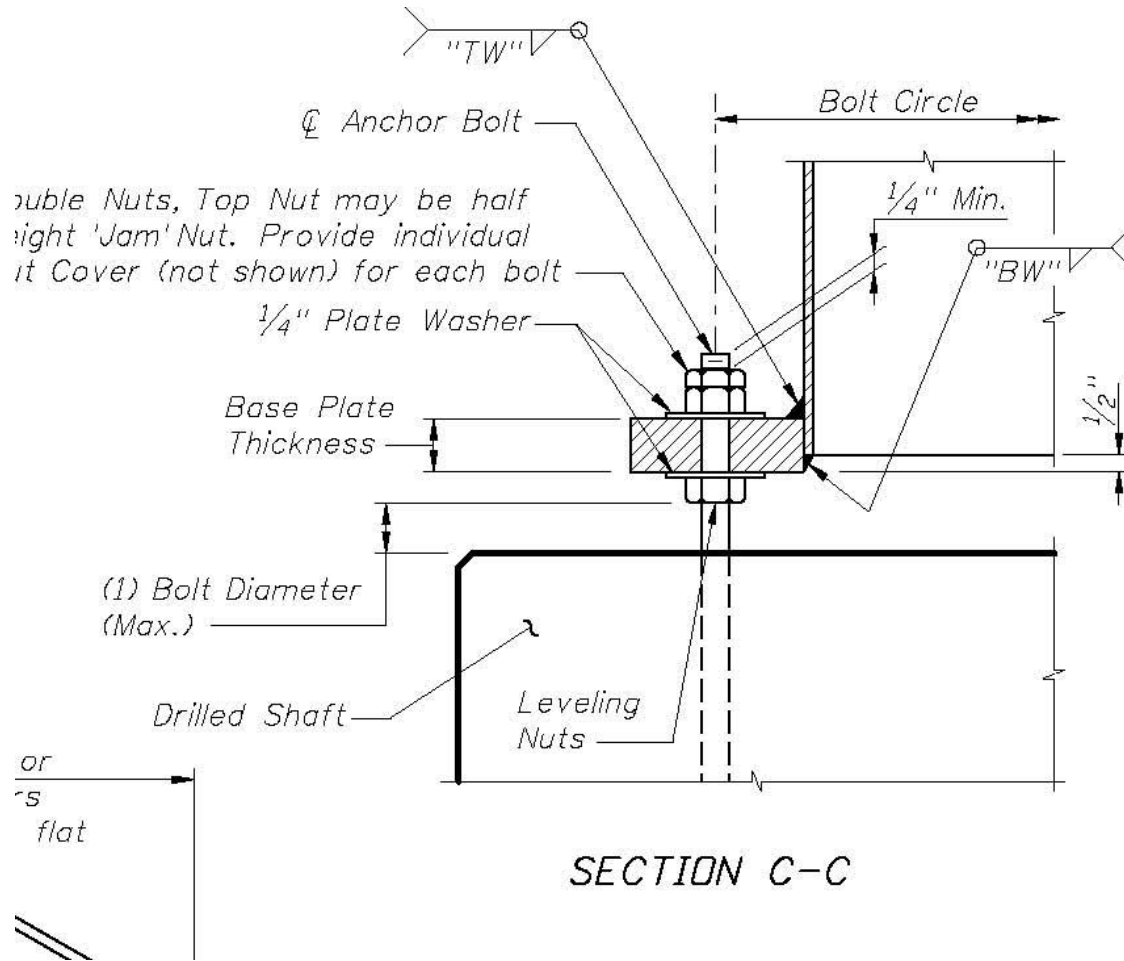
Tube-to-Transverse Plate connections



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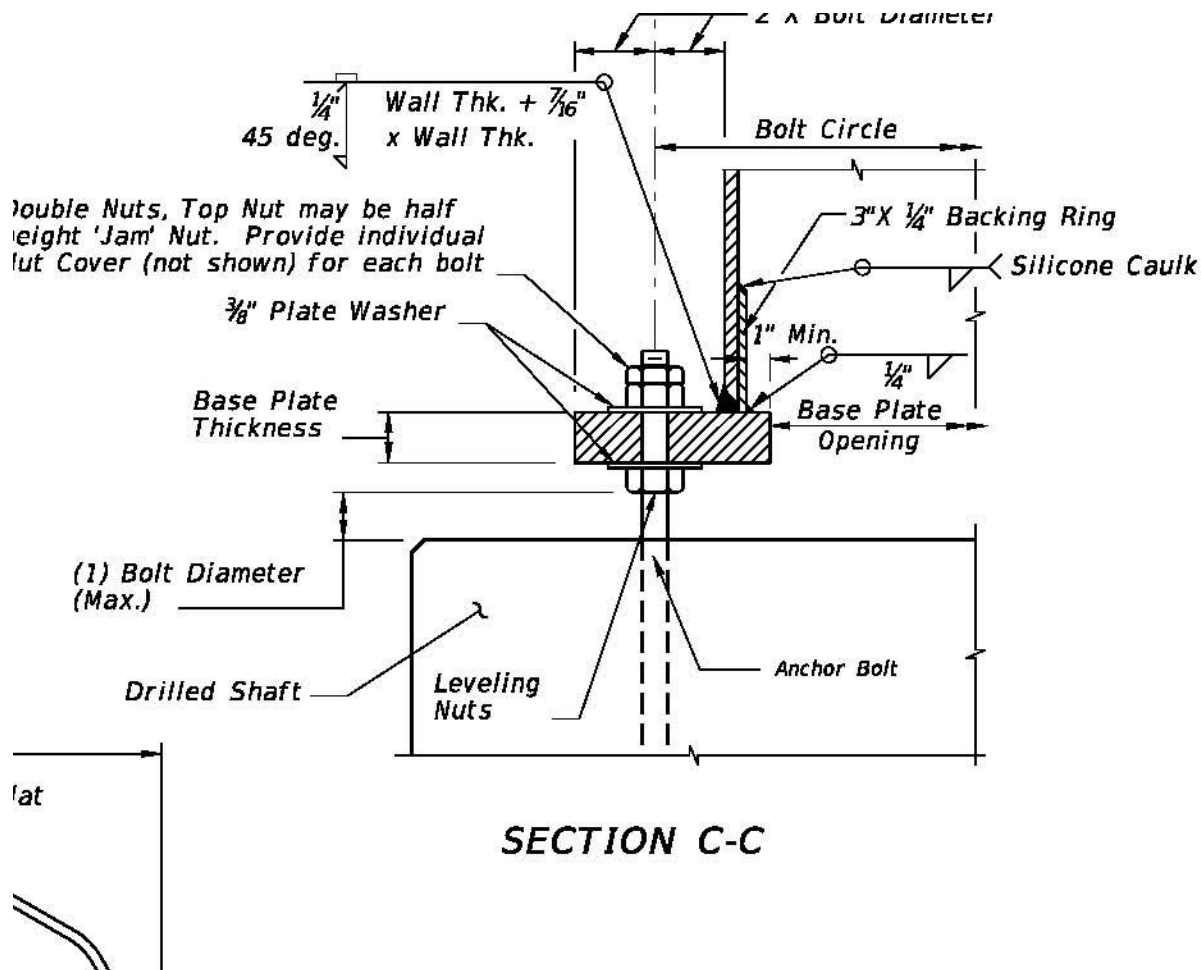


old – fillet welds





new – full penetration groove weld





Tube-to-Transverse Plate connections

- greater fatigue threshold
- thicker baseplate & full pen weld
- old CAFL = 2.6 ksi
- new CAFT = 4.5 ksi or 7.0 ksi



11300 – Overhead Sign Panels

- expanded table for 18' x 45' sign panels
- future limits on truss depth and cantilever length



11300 – Overhead Sign Panels

TYPICAL SIGN FACE ELEVATION FOR OVERHEAD TRUSS

NOTE: If the Sign Panels are deeper than 10'-0", a horizontal panel splice is allowed at an interior Zee support, shop drawings shall be required, Minimum panel section width = 2'-6".

NOTE: Spacing of vertical hangers may be varied slightly or as necessary to clear the truss struts and diagonals at panel points.

SECTION C-C

BACKING STRIP DETAIL

TYPICAL DETAIL OF SIGN & TRUSS CONNECTION

DETAIL A

Number Of Zee 3x2.69x2.33 Horiz. Wind Beams For Sign Depth			Number Of 16x4.69 or Zee 4x3.13x3.58 Vertical Hanger Beams For Sign Length				
Wind Speed	No. Beams	Max. Depth	2 Hangers	3 Hangers	4 Hangers	5 Hangers	6 Hangers
			Max Length	Max Length	Max Length	Max Length	Max Length
150	2	5'	15'	30'	45'	X	X
150	3	9'	15'	30'	45'	X	X
150	4	12'	15'	22'	30'	38'	45'
150	5	15'	15'	22'	30'	38'	45'
150	6	18'	15'	22'	30'	38'	45'
130	2	5'	15'	30'	45'	X	X
130	3	9'	15'	30'	45'	X	X
130	4	12'	15'	22'	30'	38'	45'
130	5	15'	15'	22'	30'	38'	45'
130	6	18'	15'	22'	30'	38'	45'
110	2	5'	15'	30'	45'	X	X
110	3	9'	15'	30'	45'	X	X
110	4	12'	15'	30'	38'	45'	X
110	5	15'	15'	30'	38'	45'	X
110	6	18'	15'	30'	38'	45'	X

DETAILS OF SIGN FACE & TRUSS CONNECTION

STEEL OVERHEAD SIGN STRUCTURES

INDEX NO. 11300

SHEET NO. 0.

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11300 – Overhead Sign Panels

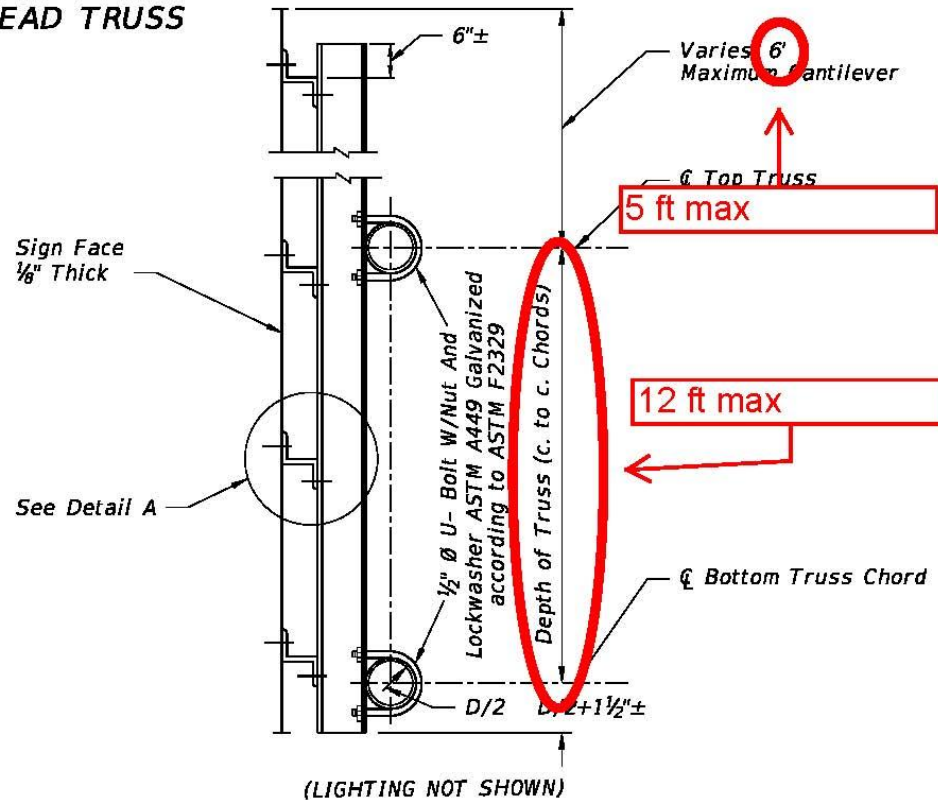
Number Of Zee 3x2.69x2.33 Horiz. Wind Beams For Sign Depth And Wind			Number Of 16x4.69 or Zee 4x3.13x3.58 Vertical Hanger Beams For Sign Length				
Wind M.P.H.	No. Beams	Max. Depth	2 Hangers Max Length	3 Hangers Max Length	4 Hangers Max Length	5 Hangers Max Length	6 Hangers Max Length
150	2	5'	15'	30'	45'	X	X
150	3	9'	15'	30'	45'	X	X
150	4	12'	15'	22'	30'	38'	45'
150	5	15'	15'	22'	30'	38'	45'
150	6	18'	15'	22'	30'	38'	45'
130	2	5'	15'	30'	45'	X	X
130	3	9'	15'	30'	45'	X	X
130	4	12'	15'	22'	30'	38'	45'
130	5	15'	15'	22'	30'	38'	45'
130	6	18'	15'	22'	30'	38'	45'
110	2	5'	15'	30'	45'	X	X
110	3	9'	15'	30'	45'	X	X
110	4	12'	15'	30'	38'	45'	X
110	5	15'	15'	30'	38'	45'	X
110	6	18'	15'	30'	38'	45'	X



11300 – Overhead Sign Panels

slightly or as necessary
panel points.

OVERHEAD TRUSS



TYPICAL DETAIL OF SIGN & TRUSS CONNECTION